



An Coimisiún um
Rialáil Cumarsáide
Commission for
Communications Regulation

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

Non-confidential Submissions to Document 21/114

Submissions to Consultation

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1 Competition and Consumer Protection Commission



Response to the consultation on ComReg's Strategy to Promote Over-the-Air Provisioning

Commission for Communications Regulation (ComReg)

23rd of December 2021



Coimisiún um
Iomaíocht agus
Cosaint Tomhaltóirí

Competition and
Consumer Protection
Commission

Introduction

The Competition and Consumer Protection Commission (CCPC) welcomes the opportunity to respond to the consultation on the *ComReg Strategy to Promote Over-the-Air Provisioning*. This consultation concerns the concept of Over-The-Air (OTA) Provisioning, which the European Electronic Communication Code requires is promoted by each Member State¹, to further facilitate switching provider. This gives discretion to regulatory authorities to define which switching processes use OTA. As part of their Electronic Communications Strategy Statement, ComReg set out an intention to commission an expert study in 2021 to support the development of a strategy for OTA provisioning, and to develop an action plan to promote OTA provisioning.²

We provide comments below about the potential benefits to consumers of the measures proposed, and further considerations that could enhance the effectiveness of the measures proposed. Our remarks will focus closely on the eSIM concept and the differences it could make to the switching process for the consumer in mobile.

We recognise the concept of the eSIM, as outlined in the consultation document and supporting report, *Strategies to Promote Over-the-Air Provisioning*, will remove the need for a SIM card to be replaced physically in a mobile phone, which can cause delays in the switching experience, especially when it has to be delivered to the consumer. At present the physical card must be removed and replaced in device, with the number ported, which can create delays of up to 3 weeks to the process. The eSIM would retain these details on the device, enabling more seamless switching between providers, via QR code scan and download of the new details, or downloading an app in which the switching process could be undertaken. Removing the need for a physical card to be in the device could also enable consumers to practically retain multiple packages with different providers on the one eSIM, which at present they could only do by swapping different physical cards in and out of their mobile and losing functionality.

ComReg's proposals to require fully digital 'over the air' (OTA) journeys for consumer mobile within 12 months of published responses to this consultation, and to develop guidance on OTA provisioning is welcomed by the CCPC. We note that this requirement for fully digital over the air journeys for consumer mobile would be supported by ComReg developing guidance on OTA provisioning, issuing new guidelines on minimum contractual conditions, conducting information gathering on eSIM adoption and activation, and launching an awareness campaign promoting eSIM to industry and consumers.

Consumer engagement

The CCPC will publish a report on pricing practices across 12 essential markets, including mobile phones, in 2022. The Pricing Practices project involves the Communications,

¹ [Directive \(EU\) 2018/1972](#).

² [ComReg, 'Electronic Communications Strategy Statement 2021 to 2023'](#).

Finance, Insurance, and Energy sectors, including the market for consumer contracts and packages in mobile. The scope of the project is to analyse consumer experiences where they are receiving different prices or terms for the same/very similar product or service, and/or where the presentation of pricing could cause consumer detriment or negatively impact the consumer achieving positive outcomes in the market. The project team will explore pricing strategies that target consumer behaviour or biases, as well as direct deployment of price discrimination, in these 12 markets.

Through a comprehensive review of literature, and relevant policy making internationally, the CCPC has formed an internal map of relevant potentially active pricing strategies domestically. A survey of 1,850 consumers has also provided the CCPC with insight into how consumers locate information about pricing and use their knowledge of pricing in engaging with the market. Findings from the CCPC's survey have indicated that nearly 20% of mobile phone consumers are holding the product in a bundle, and information online is the prominent information source for most consumers engaging with the market. However, the number of consumers who find out information about mobile products via offline methods, such as via telephone, is still significant, with over a quarter of consumers having done so. The CCPC also found that those consumers who had fallen out of their initial contract periods, and had entered a rolling contract/out of contract status, were shopping around at significantly lower rates than those in a contract, and were significantly less likely to say they would shop around within the next two years.

Switching and Competition

Increasing the speed and ease of a switching process can enable consumers to explore better deals, and for competition to function more effectively, potentially enhancing the ability of new or smaller providers to gain market share from established operators. We note that the supporting technical report by WIK³ finds that OTA switching would increase support for the consumer right to switch and port, and could increase switching and competition, saving consumers money through improved competition and lower activation fees.

Speeding up the process of switching for the consumer is welcome, even as a standalone measure, however this 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. This OTA measures should ideally be accompanied by other initiatives enabling the consumer to effectively compare providers, calculate their own usage patterns alongside offers, and have a clear idea of the total price they will be paying over a contract term. The CCPC notes that the introduction of periodic 'Best Tariff Advice' in the consumer's Contract Summary, by ComReg in regulatory guidance,⁴ will give consumers a

³ [WIK, 'Strategies to Promote Over-the-air Provisioning'.](#)

⁴ [ComReg, 'Regulatory Guidance on Title III: End-User Rights of the European Electronic Communications Code'.](#)

regular, comprehensive, comparison between different packages available from their existing provider, and in some cases they will be able to use this to move to a better value package with their own provider, or the prompting to compare price may trigger the consumer to switch. The exploration of initiatives that give consumers more accurate information when comparing packages offered by different providers (including being able to effectively map their own usage) would be welcome.

Making switching more user friendly should also be accompanied by other measures to tackle delays to switching experienced by consumer. One of the measures highlighted in the WIK report is the practice of handset locking, which the report suggests could add between 3 days and 3 weeks to the switching process, and statistics are quoted to support the assertion this is a prevalent practice in the Irish market. This has been highlighted by agencies such as the Australian Competition and Consumer Commission (ACCC) in Australia⁵ or The Office of Communications (Ofcom) in Britain, which have proposed measures to ban mobile companies from selling locked phones.⁶ The practice, by adding delays to the process, and making it more difficult for consumers to explore switching to other networks, can be detrimental to consumers comparing offers and the details of their current package price, and from potentially switching. This practice could have negative effects on competition, making it more difficult for growing or new providers to gain markets share via making offers to new consumers, and encouraging existing providers to pursue pricing practices based on rising prices for more inert consumers.

It is therefore recommended that ComReg explore further the concerns outlined in the supporting report that Handset Locking could diminish the potential benefits of eSIM, and explore the feasibility and effects of restricting or banning the practice.

We also note the suggestion in the WIK report that eSIMs could allow for the increased use by consumers of secondary contracts for specialised services such as calls/data roaming, additional services from different providers, or ensuring better network coverage. In practice, provision of services through a physical SIM can act as a barrier to consumers doing this, as the physical SIM cards would have to be swapped out of the phone when needed, or the consumer would have to acquire multiple devices. Removing the need for this could assist competition to develop in new areas, by giving consumers a wider range of options, and the ability to 'split' their packages. This in turn could increase competition for 'bolt-on' services such as roaming, which may at present be offered as part of a package, or as add-ons to a contract through the consumer's existing provider, especially at the point of sale of a contract online. This may have the long term potential to change the way prices and services are offered to consumers in mobile.

⁵ [Australian Competition and Consumer Commission, 'ACCC Assessment of Competition Concerns Relating to e-SIMs'](#).

⁶ [Ofcom, 'Making Sure Consumers Are Treated Fairly'](#).

While this may have pro-competitive effects, it may also increase complexity, or the time needed, for consumers to find the best deal. It may also place a further premium on consumers being digitally engaged and finding information online. We particularly note that the WIK report references the potential for eSIM to reduce the number of physical stores or independent retailers selling phones. This may disadvantage those who prefer to find information via offline means, and find information and sign up in a physical store. The CCPC notes that ComReg plans to launch an awareness campaign promoting eSIMs to consumers, and gather information on eSIM adoption and activation. We recommend that in doing so ComReg carefully consider how to capture the needs of multiple groups of consumers, including those who may be less digitally engaged, to inform that activity.

ENDS



2 Eircom Limited

eir Response to ComReg Consultation

ComReg strategy to promote Over-the-Air provisioning

ComReg Document 21/114



17 December 2021

DOCUMENT CONTROL

Document name	eir response to ComReg 21/114
Document Owner	eir
Status	Confidential

The comments submitted in response to this consultation document are those of Eircom Limited and Meteor Mobile Communications Limited (trading as 'eir' and 'open eir'), collectively referred to as 'eir Group' or 'eir'.

Please note that, for the purposes of the Freedom of Information Act 2014 and the Communications Regulation Act 2002 (as amended) and in the context of the eir Group's general rights and obligations, information supplied by the eir Group to you may contain confidential, commercially sensitive or price sensitive information consisting of financial, commercial, technical or other information, whose disclosure to a third party could result in financial loss to the eir Group, could prejudice the competitive position of the eir Group in the conduct of its business, or could otherwise prejudice the conduct or outcome of contractual or other negotiations to which the eir Group is a party.

Accordingly, you are requested to contact a member of eir Group's Regulatory Strategy Team where there is a request by any party to have access to records which may contain any of the information herein and not to furnish any information before the eir Group has had an opportunity to consider the matter.

Response to consultation

1. eir welcomes the opportunity to comment on ComReg's proposed strategy in respect of promoting Over-The-Air (OTA) provisioning. eir is supportive of ComReg's ambition to promote fully-digital OTA customer journeys for consumer mobile. However eir is concerned by the manner in which ComReg proposes to achieve the strategic ambition by mandating "*MNOs to provide fully digital consumer activation, switching and porting journeys for eSIM-enabled smartphones within 12 months of ComReg publishing its response to consultation, the Action Plan and any supporting Decision(s)*". eir does not consider this to be a proportionate approach for a number of reasons.
2. eir agrees that OTA can deliver interesting use cases in time, however the market should be allowed to evolve without a regulatory mandate in the near term. Existing competitive forces in the market will ensure this happens. Barriers to mobile switching are low in Ireland as acknowledged by Wik in their separate study of the mobile market¹ and there is no evidence of a market failure that requires regulatory intervention. The perception that Ireland may be lagging behind in the adoption of OTA is not of itself a justification for regulatory intervention.
3. It is not clear what regulatory powers ComReg is seeking to exercise. It is notable that ComReg has not published any draft Decision(s) with this consultation. This is a departure from good regulatory practice as required by the regulatory framework. ComReg advises at paragraph 23, "*ComReg's response to consultation, to include ComReg's final strategy and action plan and any supporting decision instruments, is planned for completion by Q2 2022 at the latest.*" There is no reference to there being a further consultation on a decision instrument prior to it being adopted. However ComReg is explicitly required under Article 23(1) of the Code to "*give interested parties the opportunity to comment on the draft measure*" and a clear statement of the powers it is relying upon. This is absent from the current consultation and a new consultation is required in respect of any draft measures. In that regard we also note that the most recent Government guidelines on consultation 'Consultation Principles and Guidelines' (November 2016) state that "*Consultation should also be seen as a recurring need in policy development and be carried out at various stages if appropriate, rather than be seen as a one-off event.*" Those guidelines are also clear on the need to provide the public with the necessary information (in this case any draft Decision Instrument) in order for stakeholders to be able to make informed comments:

¹ ComReg 21/101a

“Information or papers should, wherever possible and appropriate, be made available to stakeholders to enable them to make informed comments on proposals.”

4. On the basis that ComReg has not identified a market failing it must be assumed that ComReg will seek to rely on alternative powers. None are explicitly mentioned although ComReg alludes to Article 93(6) as relevant in this regard. Article 93(6) of the Code requires member States to promote OTA where technically feasible. ComReg refers to guidance from the Commission on the implementation of the Code which indicates that Member States have a margin of flexibility when transposing and implementing Article 93(6) such that measures promoting OTA could be through binding measures or through soft law². However Article 93 has not been transposed into Irish law and ComReg has therefore not been granted any powers by the State further to Article 93 to ‘promote over-the-air provisioning’ whether by means of binding measures or by any other means³. eir has had no sight of the Government’s intentions regarding the transposition of Article 93 but expects there will be some form of consultation and regulatory impact assessment concerning what powers might be given to ComReg pursuant to Article 93. It would therefore be concerning from a transparency perspective if ComReg is seeking to pre-empt the transposition of Article 93 and influence how it is transposed, with the current consultation.

5. ComReg proposes 9 actions for its strategy. Of primary concern to eir is Action 1. Action 1 proposes to require fully-digital Over-the Air customer journeys for consumer mobile within 12 months of ComReg publishing its response to consultation and Decision(s). Without prejudice to eir’s position that there is no current justification for ComReg to use its powers in this manner, eir does not agree that a 12 month implementation window is reasonable or proportionate when there is no clear understanding on what an industry process will look like. The design of the solution will be dependent on ComReg’s proposed Action 2 to develop guidance (“Guidance for OTA provisioning for Consumer Mobile”) regarding the design and implementation of an optimised OTA product and processes to support fully-digital consumer journeys, and Action 3 requiring the industry MNP Committee to review existing MNP processes within 6 months. Consequently consideration of implementation cannot be progressed until Actions 2 and 3 are completed.

² “The obligation in Article 93(6) (“promote”) leaves a wide margin of flexibility to Member States when transposing and implementing Art. 93(6). As such, this provision does not require transposition in their national legislation or via secondary technical provisions. However, Member States are required to take measures to promote “OTA provisioning”. This may imply the adoption of measures encouraging such use, either through binding measure or through soft law (e.g. publishing best practice, policy orientations) with the stated aim to “promote” OTA.”

³ The principle of direct effect would not appear to apply here given the Commission’s guidance that Article 93(6) leaves a wide margin of flexibility.

6. eir notes the draft Guidance for OTA provisioning for Consumer mobile in section 3.5 of the consultation which discusses 5 broad principles. These principles are:
 1. Consumers should be able to avail of seamless end-to end fully-digital OTA customer journeys.
 2. OTA activation and switching should be as fast as possible.
 3. Clear and sufficient information should be provided to complete seamless OTA customer journeys.
 4. OTA switching shall be recipient-led.
 5. OTA provisioning should be safe and secure.

7. eir is supportive of the principles however more detail is required on how compliance with each principle may be assessed before the practical implications of the broad principles in terms of solution design can be considered. More clarity is required to assess the potential burden that will be imposed by ComReg's proposed mandate consistent with the obligation on ComReg to ensure its decision making is proportionate. For example paragraph 185 states "*In OTA provisioning the binding constraint on switching times will shift from securing of the physical SIM (i.e., two days) to the duration of OTA processes (i.e., minutes) and porting (i.e., typically minutes but no more than two hours).*" Operators would need to know if they were being mandated to process all OTA provisions within a few minutes, or within 2 hours (noting that this applies only in respect of single line ports). Given that no process is perfect it may be more reasonable, if a target is to be set for assessing compliance, that x% of transactions should be completed with y units of time. Operators require more detail on the application of the principles in order to design compliant solutions. Guidance may also be required on whether all handset manufacturers are in scope or only those that make entitlement servers available on a reasonable basis. These and other details will be a factor in the required implementation timelines and costs of the solutions.

8. ComReg proposes to mandate a 12 month implementation window based on an unsubstantiated footnote in the WiK OTA report. Wik state in Footnote 209 "*Interviews conducted for this study suggest that a timeframe of between 18 months to 2 years may be needed for MNOs to establish their own eSIM solutions. However, faster solutions are available via the use of eSIM management providers, and the faster adoption rates of eSIM in other EU Member States including by MNOs within the same Group as those operating in Ireland suggests that a 1 year timeframe should be feasible.*" There is no analysis presented to support Wik's subjective opinion that the interviewees view of 18 months to 2

years is incorrect. Rather Wik appear to suggest that MNOs should be mandated to implement third party solutions to achieve an earlier implementation in their opinion. ComReg is overstretching its powers in seeking to impose a mandate that MNOs must use a third party solution. Reference is also made to faster adoption rates of eSIM in other Member States although the adoption rate is not relevant to the time required to make a solution available.

9. In any event, whether a third party or self-provided solution, IT development will be required to integrate the preferred solution to an operator's existing Business Support Systems to facilitate the OTA provisioning process. As ComReg will be aware IT development is subject to scheduling and [✂ [REDACTED]

[REDACTED] If ComReg imposes a 12 month implementation deadline this will require a re-scheduling of planned works thereby delaying customer benefits that arise from improvements to the BSS and the delivery of new functionality. ComReg has failed to acknowledge the opportunity cost directly arising from its proposed decision making. Further, by mandating a short deadline to comply with the mandate ComReg may in fact be increasing the cost burden on MNOs if they are forced down the route of relying on a third party supplier instead of utilising skilled internal resources. This is not surprising as ComReg has failed to undertake a regulatory impact assessment of its proposed measures. Again, this is another unacceptable departure from the regulatory process.

10. At paragraph 113 ComReg makes the following observation on cost – *“In relation to costs, eSIM support entails investment by MNOs in, among other things, relevant equipment (if an in-house solution is adopted) and in updating internal processes and staff training. The cost is likely to vary by operator depending on how far their existing processes would need to be modified and on whether the choice is made to invest in an in-house solution (involving capex and personnel), or eSIM-management is outsourced to a specialist provider (involving operational expenditure). ComReg notes such expenditure seems inevitable given the expected growth in the use of eSIM for provisioning for smartphones, and that consequently this cost is merely brought forward by any such mandate (e.g., eSIM is likely to be adopted in any relevant counterfactual). Furthermore, it should be noted that OTA provisioning is expected to result in some offsetting reductions in costs, albeit over a longer timeframe.”* Whilst the expenditure may be considered inevitable it is not reasonable to trivialise the costs as being merely brought forward. As noted above, ComReg has failed to consider the opportunity cost of issuing a mandate in the near term with a very short deadline for compliance. It also fails to consider the increased costs of being compelled to

complete the work in a much shorter time-frame than would otherwise occur, and the fact that it may in effect compel MNOs to use third party rather than internal resources.

11. The consultation is also very light in terms of any evidence of near term consumer benefits. At paragraph 112 ComReg states “*A requirement for MNOs to support OTA provisioning for consumer mobile would make available significant benefits to the majority of the 5.2 million mobile customers in the State. As previously set out in Section 4.2, OTA provisioning should impact competition in mobile markets primarily through enhancing the ease of switching between mobile providers, which could bring consumer benefits in the region of several million euro annually.*” This is a very sweeping statement and nowhere does ComReg set out evidence such as compatible device penetration to support its position. Indeed Wik’s earlier study of competition in the mobile market characterises the Irish market as one with intense competition, and as noted above, one in which barriers to switching are low. The consultation contains no proper assessment of the proportionality of the proposed measures despite the fact that ComReg is legally obliged to assess proportionality of any proposed measure by means of evidence based review. This includes assessing, based on available evidence, whether the measure is necessary to achieve a legitimate objective at all, including in light of the factors outlined above such as current low barriers to switching, and the fact that existing market forces are sufficient to ensure a move over time to OTA provisioning; and whether the proposed measure is the least onerous means by which the regulatory objective can be achieved. Neither is assessed in the present consultation.
12. A proper consultation on the proposed measures, including the draft text of the legal instruments that clearly sets out their legal basis, together with a clear analysis of the attendant costs and benefits of the proposed measures is required if ComReg intends to pursue the imposition of a mandate on MNOs. However as noted at the start of this response we believe market forces will deliver OTA provisioning in due course. Should ComReg wish to pursue this matter further we would recommend ComReg establishes a working group involving the wider range of stakeholders in the eco-system. For example, SIM vendors, smartphone vendors and IoT device vendors etc.

3 ESB Networks

Networks Telecoms, ESB Networks

ESB Networks' Response to ComReg's Strategy to Promote Over-the-Air Provisioning (21/114)

20/12/2021

1. INTRODUCTION

ESB Networks (ESBN) welcomes the opportunity to respond to the Commission for Communications Regulation (ComReg) consultation on strategy to promote Over-the-Air provisioning (ComReg Document 21/114).

2. ESBN Response

ESBN has engaged with ComReg and its consultants on this matter previously. ESBN considers it to be very important that ComReg progress with its planned strategy to promote OTAP for a number of reasons.

From an individual user's perspective, the matter of changing SIM cards is a limiting factor when changing service provider, hence promoting inertia and disincentivising innovation.

From ESBN's and industry user's perspective, quite often a more significant issue is the cost of a truck roll to change SIM cards when changing provider. The cost of doing so usually greatly outweighs the benefits that can be gained from changing provider, promoting inertia, reducing innovation, and creating major issues when trying to get value for money from providers.

Increasingly, changes to remote devices are taking place remotely (e.g. firmware upgrades). The capability is already there within technology, networks and devices to enable OTAP. Other benefits of remote provisioning are environmental benefit of not sending people to change SIMs, safety improvements with less requirements to drive and access remote devices, promoting innovation and competition amongst other things.

Therefore, ESBN is strongly supportive of ComReg's strategy as is presented in Chapter 5 of its Consultation document (21/114) and ESBN are available to provide any further assistance or engagement to assist ComReg in its endeavours.

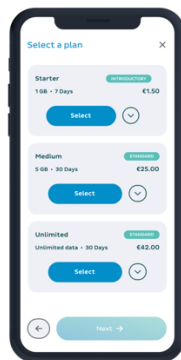
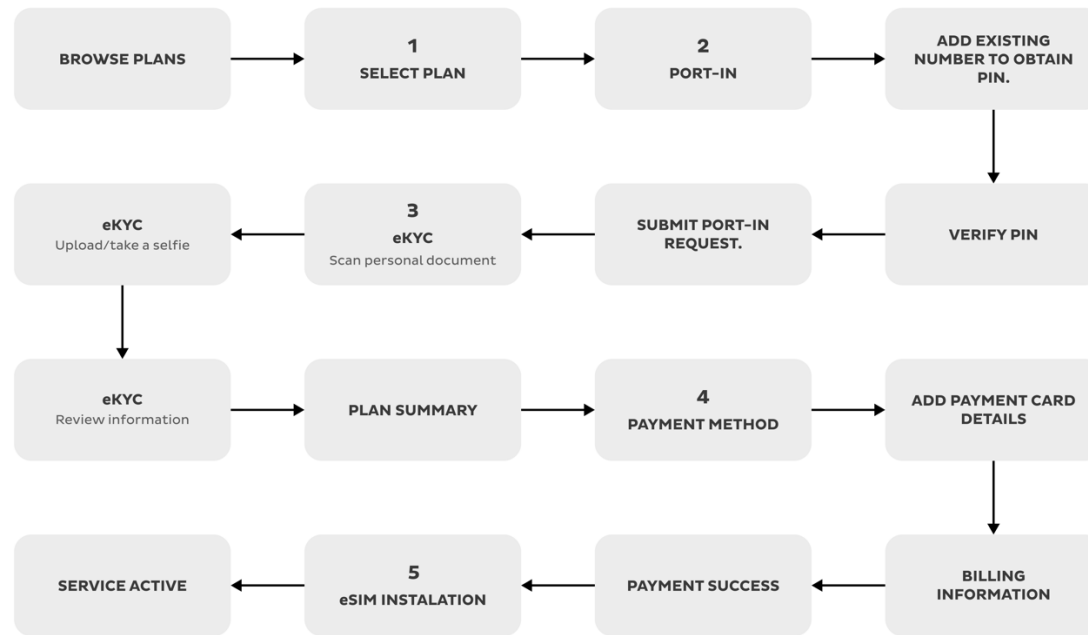
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4 Mobilise Holdings Limited

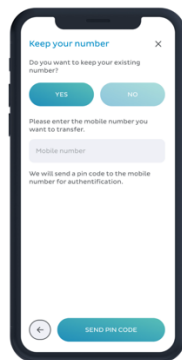
Questions	Mobilise Response
Chapter 3 Consultation Questions	
<i>Technical Background</i>	
<p>Q1: Does the technical background described and outlined by WIK capture all technical matters relevant and material to ComReg’s promotion of Over-the-Air provisioning? What, if anything, should be included?</p>	<p>Whilst we consider the technical background described and outlined by WIK to capture all technical matters relevant and material to ComReg’s promotion of Over-the-Air provisioning. We would, however, suggest the following technical aspects to be worthy of further consideration:</p> <ul style="list-style-type: none"> • Cloud Platform Systems, and their role in accelerating the eSIM deployments. • OEMs and the central role they play in facilitating eSIM in-App provisioning • Electronic Know Your Customer e(KYC) services and their role in supporting identification and verification of a customers when using eSIM capability.
<i>Use Cases</i>	
<p>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?</p>	<p>We consider the use cases to be representative for the purposes of formulating suitable regulation.</p>
<i>eSIM deployment and activation in Ireland</i>	
<p>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?</p>	<p>We see no obvious reason why MNO’s would be lagging in their adoption of eSIM capability versus other European markets. Indeed, it is likely that most Irish MNOs already have access to eSIM subscription platforms via their existing SIM vendors. All major SIM vendors ie Thales, Giesecke & Devrient, IDEMIA etc of which it is likely Irish MNO’s procure physical SIMs from, all have eSIM platform offerings.</p> <p>Further, eSIM is a global specification by the GSMA with common integration specifications meaning there are no particular integration barriers for Irish MNOs versus MNOs in other countries, which would give reason to Irish MNO lagging other markets. We therefore feel access or integration of the technology are not factor in the apparent lag in Ireland. In our opinion the reasons could be arising from factors such as:</p>

	<ul style="list-style-type: none"> - Commercial fear of enabling and raising the awareness of a technology that could facilitate easier switching - A general lack of focus on customer experience by MNO's. For example, eSIM. We find this a global issue not just an Irish one. - Lack of innovation - Project backlogs and lengthy delivery cycles - Prioritising other product implementations deemed to have a higher business priority - In the case of secondary devices (i.e. smartwatches) a lack of business case to support required investment
Q4: Is the deployment and activation of eSIM for M2M use cases in Ireland ahead of that in comparable countries? Why/why not?	Our anecdotal evidence suggests that Use cases and volumes of M2M eSIM activations in Ireland seems positive.
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?	<p>For consumer eSIM we believe the forecasts, and current penetration of eSIM capable devices in Ireland, are conservative.</p> <p>Based on our experience to date a key driver in the adoption of consumer eSIM is the availability of eSIM compatible smartphones. The number of eSIM capable devices has now reached an inflection point with all major OEMs i.e., Apple, Samsung, Google, Huawei, Motorola etc offering eSIM as standard in new device models with as of Dec 2020 circa 43 devices offered commercially.</p> <p>However, this must be viewed in relation to the fact that the GSMA states that only 20% of customers, on average, are aware of eSIM. However, and that up until now, only 14% of telcos have launched eSIM offerings worldwide.</p> <p>Further, when this availability is considered along with the latest data from the Trusted Connectivity Alliance, which shows that eSIM shipments grew 83% YoY (vs 50% growth in 2019) in predominantly developing markets who have high penetration of feature phones, it is reasonable to surmise that in developed markets such as Ireland, and Europe more broadly, penetration of eSIM capable devices is higher.</p> <p>These data points do tend to illustrate that penetration of eSIM devices is growing rapidly. When we localise these global statistics to mature markets such as Ireland, where consumers have higher</p>

	<p>disposable incomes versus global averages, and MNOs use device subsidies extensively, it is reasonable to expect that the penetration of eSIM capable devices is set to accelerate rapidly within the next 12-18 months.</p> <p>However, another factor needs to be considered in that a key driver of eSIM adoption is consumer awareness and that just having an eSIM capable phone does not necessarily mean the user will abandon the traditional physical SIM as their choice of method for connectivity.</p> <p>Based on our research, the promotional activity of those offerings is negligible. Many of those operators do the bare minimum in promoting eSIM. In addition, many operator implementations of eSIM technology are not designed to deliver the truly digital user experience eSIM can offer and lack of promotion and education of their users of the benefits of eSIM may delay adoption.</p> <p>We would therefore suggest that ComReg could consider in its OTA strategy tactics to support increased consumer awareness regarding the benefits of eSIM. These could focus on both customer experience benefits i.e. flexibility, convenience, choice etc but also environmental benefits arising from the reduction in the use of plastics, etc.</p>
<p>Chapter 4 Consultation Questions</p>	
<p><i>The impact of OTA on customer journeys</i></p>	
<p>We have reviewed the suggested user journeys in Figure 6 page 32, and we wanted to offer a more detailed view for guidance on the recommended user journey based on our analysis of digital user journey optimisation and digital solution deployment for mobile telcos. The user journey is also accompanied with few illustrative screenshots of the user interface to the key steps in a digital user onboarding process. The diagram below shows the user journey for the Click and Switch use case.</p> <p>Furthermore, we would also like to share the full user journey demonstration in the video linked here.</p>	



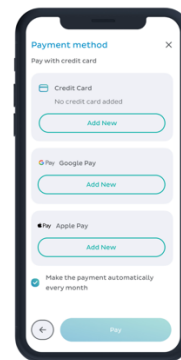
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Competition	
<p>Q6: Do you agree with the analysis of the competitive effects of eSIM and Over-the-Air on competition in mobile markets? If not, how do your views differ?</p>	<p>Whilst recognising that the number of steps in existing porting process can vary between those markets that have already introduced OTA provisioning, there is anecdotal evidence any process that speeds up the switching of plans or carrier from a user perspective does encourage churn and as such has forced MNO to consider their competitive position in order to both acquire and retain customers. We would also contend that to date the majority of OTA provisioning has been using the QR Code methodology, but we do predict that significant opportunities to reduce time to an even greater extent by the utilisation of in-app provisioning.</p> <p>In the case of in-app option, the provisioning of the eSIM profile, and initial attach to the network can take between 20-40 seconds. Further, it should be possible to allow the customer to initiate the porting process from within the mobile application itself. Using the mobile application to support the porting process provides additional efficiencies beyond just the eSIM provisioning sequence. For example, the mobile application is able to reduce the number of input steps the user must conduct based on data read from the device for example prepopulating current MSISDN.</p> <p>All these factors will encourage further adoption of OTA provisioning and as such will increase the propensity for churn, again applying pressures on MNO's to not only seek to differentiate on price but QoS aspects in order to maintain or enhance competitiveness.</p>
<p>Q7: Does the description of the competitive effects of eSIM and Over-the-Air consider all relevant impacts? If not, what should be included?</p>	<p>We would comment whilst that the report rightly focuses on the "Consumer Side" benefits we felt that it does not consider sufficiently the "supply side" impacts which in turn may have adverse impact upon consumers. In this regard, we feel consideration should be given to the strategic impact of the introduction of OTA, see our response to Q23.</p> <p>Further, we are concerned that the recommendations do not extend to MVNO's (see para 93) and if MNOs are not obligated to provide support to MVNO's then the consumers will be denied the current price benefits they typically enjoy as MVNO price advantages will erode and the MNO's will have a commercial advantage that could be considered "anti-competitive"</p> <p>At the same time, without the mandating of access to OTA provisioning to the MVNO community may slow the user adoption will as well as hindering the introduction the new breed of digital MVNOs, who would be more focused on user digital experience and quality of experience.</p>

	<p>We would contend that extending the OTA provisions to MVNO's will offer a "level playing field" that will increase the competition and encouraging MNOs to further improve the digital experience offered to the end-user.</p> <p>In this context of ensuring competitiveness, whilst is at an early stage of commercial deployment, there is growing evidence of the convergence between traditional Telco's and the so called "Hyperscaler's" (AWS, Google, Microsoft etc) with their expansion into the traditional Mobile telecommunications arena that does warrant at least a watching brief on any potential impact on the competitiveness of the market. There is already evidence that with the advent 5G that the Hyperscaler's are looking to bypass the Traditional MNO's (i.e., Project Fi from Google and the availability of Private 5G networks from AWS) that the growing adoption of OTA provisioning may accelerate this tend and that measures need to be put in place that new entrants are required to conform to the same standards as imposed upon traditional Telco's.</p>
<p>Environment</p>	
<p>Q8: Do you agree with the analysis of the environmental effects of eSIM and Over-the-Air?</p>	<p>In broad terms we agree on the environmental benefits OTA will bring over the physical SIM has currently by virtue of the improvements eSIM can bring. On a Macro level these can be summarised as:</p> <ul style="list-style-type: none"> • Simplified logistics: When it comes to climate change, air travel is one of the most impactful forms of transportation. By requiring fewer physical components, eSIMs reduce the number of air shipments needed and, eventually, they will not be required at all. • Less factory production: Less plastic and physical materials mean fewer items need to be produced by factories. This reduces the resources needed to operate a factory as well as the harmful chemicals and waste that typically come with industrial production. • Reduced customer transportation: Because users will no longer need to travel to shops to purchase physical SIM cards, this reduces their transportation footprint whether it's by car, bus, or train. • Reduced materials: Because updates and MNO changes can be handled digitally, eSIMs eliminate the need for distributors to produce extra materials and for customers to purchase them.

<p>Q9: Does the description of the environmental effects of eSIM and Over-the-Air consider all relevant environmental impacts?</p>	<p>Yes, we consider the environmental effects mentioned are very relevant. In particular In addition to carbon dioxide emissions, we feel emphasis should be given to the plastic waste impact and the growing concern among consumers on this topic.</p> <p>In 2020, 4.5 billion plastic SIM cards were produced worldwide to connect mobile devices to the network, in a plastic and carbon-intensive manufacturing process. In this regard we note the unnecessary scale of plastic waste not least as in the current process each SIM card is enclosed in a credit card-sized holder for better usability. The holder, which is approximately 8 times larger than the SIM card itself, is disposed of right after the SIM card of the desired size has been removed (not to mention the packaging). Consumers are increasingly aware of this situation and that the ability to replace the standard credit card-sized SIM holder with new solutions (reduced size physical SIM cards, introduction of Eco friendly materials to replace plastic etc) they have the opportunity to contribute to the reduction of plastic waste if the physical SIM cards can be eliminated altogether.</p> <p>Although many telcos have partly dematerialised their SIM card offerings by reducing their size and packaging, eSIM, could eliminate the need for physical components completely.</p>
<p>Security</p>	
<p>Q10: Do you agree with the analysis of the security of eSIM and Over-the-Air provisioning standards and processes?</p>	<p>Whilst we broadly agree with the analysis of the security of eSIM and Over-the-Air provisioning standards and processes, We do however, believe that electronic Know-Your-Customer (eKYC) process is a must for every eSIM installation (including device swap, first activation and network switching) and in all cases mentioned in figure 6 (page 32) and fell that this point is not sufficiently covered in the report.</p> <p>With physical SIM cards, if a user wanted to order a new SIM, they either have to go to a store to collect it – where the service provider can validate the customer identity by checking their ID – or by having the new SIM card send to the customer registered address. Both processes provide basic confirmation that the new SIM card will be received by the account owner.</p> <p>We feel that in the absence of this physical check then there needs to be robust processes to ensure the security checks are in place to ensure that whoever is installing an eSIM is the rightful owner of the service.</p>

	<p>We feel that this is a crucial requirement, as mobile numbers are used in 2-factor authentication, primarily in sensitive services like banking. As such, a risk may arise that if a user had their mobile service online account compromised, the attackers can issue a new eSIM with the victim’s mobile number and access their banking services via phone or online banking. This is commonly referred to as <u>SIM swap scamming</u>.</p> <p>We feel this aspect needs further clarification and regulatory input to maintain the consumers trust in the security of their mobile banking services.</p>
<p>Q11: Does the analysis of the security of eSIM and Over-the-Air provisioning standards and processes?</p>	<p>This question is unclear to us.</p>
<p>Chapter 5 Consultation Questions</p>	
<p><i>Vision</i></p>	
<p>Q12: Do you agree with the Vision for Over-the-Air provisioning proposed by ComReg?</p>	<p>We agree fully with the ComReg’s vision on OTA provisioning.</p>
<p>Q13: Do you consider the 8 factors to be well specified?</p>	<p>In our opinion, the 8 factors are clear and specific enough to understand the implement the vision.</p>
<p><i>Challenges</i></p>	
<p>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?</p>	<p>We are in agreement with the challenges mentioned but would suggest that there is an additional challenge around Mobile Applications submission into OEM App marketplaces that is worthy of consideration that may impact upon the consumers access to the benefits of OTA provisioning. As it stands, there’s a lack of support by OEMs (Apple in particular) towards in-App eSIM activation mobile applications as opposed to the QR code methodology not least one suspects as it requires the OEM to be proactive in supporting it.</p> <p>For example, Apple has a very restricted and private process only shared with MNOs that have a wireless carrier agreement with Apple. This is an agreement that is typically granted to larger MNOs that resell Apple devices. Many small-to-medium sized MNOs do not have this agreement, and only few MVNOs in the world have such an agreement.</p>

	<p>So currently, there is no route for smaller MNOs or MVNOs to acquire the needed permissions to publish an app that support in-app eSIM activation.</p> <p>There is also no adequate information or documentation for the process available publicly This is one of the biggest challenges faced by any small-to-medium operator looking to implement OTA eSIM provisioning via an app. Which will very quickly introduce unfair level playing field, with larger MNOs having the leverage of onboard new customers seamlessly.</p> <p>This aspect, we contend is not to the ultimate benefit of consumers and restricts their choice to those solutions promoted by the OEMs and their MNO partners.</p>
<p>Q16: Do you consider the 8 factors to be well specified? If not, please explain how your views differ.</p>	<p>We think the 8 factors are specific enough for the purposes of introducing regulatory oversight.</p>
<p>Q17: Are there further factors ComReg should consider in its Vision for Over-the-Air provisioning?</p>	<p>We feel that the following factors may warrant further consideration by ComReg in formulating its vision:</p> <ul style="list-style-type: none"> a) The effect of “In- App” verses “QR Code” solutions may have on adoption of OTA provisioning as outlined more fully in our response to Q6 above. b) The wider strategic impact of the introduction of OTA as outlined in our response to Q23 c) Further clarification on the need to ensure interoperability between the process for OTA and the process for MNP
<p>Actions</p>	
<p>Q18: Do you agree with each of the Actions proposed by WIK which ComReg is minded to adopt?</p>	<p>Whilst we are in agreement with the Actions proposed, we would however, suggest that in serving the best interests of the consumer, more dialogue could be given to discussing the need to conform with the “Digital Single Market” in regard to interoperability and if Ireland is to be the promoter for the EU then should there be reference to mandating the adoption of the GSMA eSIM standards as the De Facto standard? We feel there is implicate agreement with this approach in the paper, but the report stops short of actually making that recommendation.</p>

	<p>Another action, (already alluded to in our reply to Q7 above) is that in action 6, para 153. Is that we believe monitoring MVNO access to OTA provisioning is not sufficient not least that as the MNOs will have full control on enabling MVNOs to achieve OTA provisioning (with exception to full MVNOs who would have their own HLR and already have freedom of SIM supplier choice) and as such may be in a position to apply distorts to the market. Hence, whilst not suggesting any infringement to the negotiation of commercial terms between parties, we believe MVNO access to OTA needs to be regulated and enforced with a defined timeline.</p>
<p>Q19: Do you agree with the justification given by ComReg for each of the Actions proposed by WIK which ComReg is minded to adopt?</p>	<p>We are in agree with the Actions proposed.</p> <p>However, we woud comment that in Para 125, 3rd point, it is mentioned that MNOs expect eSIM-only flagship devices to be introduced soon. We would like to point out that Motorola had released its flagship phone <u>RAZR</u> in Q3 2020 which doesn't have a SIM card slot, and supports eSIM only and as such OEM's are already beginning to dictate the OTA situation and as such a short time frame for regulatory oversight to protect consumers is required.</p>
<p>Q21: Are there further actions which ComReg should consider?</p>	<p>Firstly, in regard to the provisions of para 36 (page 18) we note that there does not appear to be any cross reference to the provision of how the "non OTA" option by consumers shall be managed or co-ordinated with the OTA processes i.e. what happens if a consumer does not want to/cannot use an eSIM and wishes to use a physical card and how the "divergence" in the customer journey will be managed?</p> <p>Secondly, we feel consideration should be given to the strategic impact of the introduction of OTA, see our response to Q23</p>
<p>Guidance</p>	
<p>Q22: Do you agree with the Guidance for Over-the-Air provisioning proposed by ComReg?</p>	<p>Subject to the specific points we have raised in our responses to this consultation, we do feel that in broad terms the Guidance proposed by ComReg for the oversight of OTA provisioning does provide a good framework for MNOs to operate a commercial service.</p>
<p>Q23: Are there any additional matters relating to Over-the-Air switching which ComReg</p>	<p>In regard to para 38 (Page 18) ,whilst, the basic premise of OTA /eSIM being of a benefit to the end user consumers can be demonstrated, this benefit may only have a short term effect and there is a risk that it may not bring the anticipated longer term benefits envisaged by the EU which they define as being:</p>

- Ensuring that users derive maximum benefit in terms of choice, price and quality;
- Ensuring that there is no distortion or restriction of competition in the electronic communications sector;
- Contributing to the development of the internal market; and
- Promoting the interest of EU citizens.

The ComReg consultation paper nor the EU274 paper does not seem to investigate in any depth the potential impact on the CAPEX requirements on MNO's due to the fact that in adopting the OTA ("eSIM") strategy it will accelerate the increasing commercial risk to MNO's arising from the "de-coupling" of the mobile device from the connectivity element of the service package as evidenced by the growth in "SIM-only" products.

This de-coupling is already resulting increasingly in the purchase of a device being a separate buying decision than that of the connectivity aspect in the same way as the purchase of PC's are not influenced by the choice of ISP. we would suggest that this may indirectly impact negatively upon the consumer.

MNO's are already losing the historic leverage they had from offering combined device and airtime packages to not only attract customers and retain subscribers but also the ability to mitigate cost pressures by having multiple revenue streams, this in turn may will result in a reduction in business models available to a MNO (or MVNO) with which to compete, not least as the tariffs offered to the public are already at a historic low and as such the scope for further reduction is limited (as has been seen in certain mature markets with prices stabilising) and hence with this reduction in revenue stream options there will be an increasing focus on Quality of Service as the key differentiator , and in particular network performance, which in itself can be considered a benefit to consumers.

However, it must be recognised that this is occurring at the same time as the wide spread introduction of 5G which requires a high spend on network infrastructure. Whilst it can be argued the growth in IoT and M2M devices due in part to OTA will provide additional revenue opportunities for MNO's the fact is that most of these devices will be purchased direct from vendors not via the MNO and as they will

	<p>consume very low amounts of data per device it will require high volumes of devices to enable the MNO to achieve a significant revenue stream from connectivity alone.</p> <p>Moreover, it is most likely that High data usage M2M deployments will materialise in the form of Private Mobile networks and as such other than perhaps a spectrum rental charges or backhaul (where they will compete with the dedicated ISP's) will not, at least in the short to medium timeframe, provide a significant additional revenue stream for the MNO's to compensate for the increased network costs.</p> <p>Considering this, it can be seen that MNO's will face a decision between having to accept a longer period to achieve a RoI in the 5G network or look to increase prices, which without a general market acceptance of price increases (with its attendant Regulatory and anti-Competition implications) will be hard to achieve.</p> <p>Therefore it can be argued that whilst OTA/eSIM may bring short term price benefits to the consumer it does run the risk in the longer term of reducing the ability of the MNO to further reduce prices and in consequence prevent the Consumer from benefiting from the natural competition between Operators that has been historically seen and may increase the risk of degraded network performance as the MNO's will not have the budget needed to not only maintain but enhance the network.</p> <p>Considering this, the introduction of OTA should be viewed with recognising the potential impact on achieving the EU274 objectives:</p> <ul style="list-style-type: none">• Ensuring that users derive maximum benefit in terms of choice, price and quality; At Risk – short term advantage may be negated by medium to long term reduction on depressing prices• Ensuring that there is no distortion or restriction of competition in the electronic communications sector; At Risk – The larger, often Pan national MNO's will be better placed to meet the CAPEX challenges and will place smaller more local MNOs at a disadvantage.
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		<ul style="list-style-type: none">• Contributing to the development of the internal market; At Risk – will restrict the market to best funded MNO's and could reduce local competition and reduce price competition.• Promoting the interest of EU citizens. At Risk- reduction in competitive environment reduces choice and can remove downward price pressures.
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5 Sim Local (Ireland) Limited



Response to ComReg 20/114 Report

FAO: Mr. Donnacha Hennessy

Dear Mr. Hennessy,

First, apologies for the slight delay in getting our response to you – this was due to the current COVID situation.

Here are our responses to the action items in the ComReg 20/114 report, an activity welcomed by **Sim Local**, and its sister company, **NetLync**, both of which are heavily involved with eSIM technology:

Action 1: Require fully digital Over-the Air customer journeys for consumer mobile within 12 months of ComReg’s finalised Action Plan

The benefits to consumers with regard to eSIM technology, as detailed in the report, are clear, and nearly all the major device OEMs have implemented the technology in their latest mobile device products, at least in the higher ends. However, many mobile network operators have still not implemented the technology yet, despite the operator community having worked together with the rest of the mobile industry, via GSMA, to successfully develop the technology specifications back in 2016. As a result, consumers are being denied these benefits, for no obvious reason. Our company, NetLync, has all the technology required for mobile network operators to make themselves eSIM-ready in a short timeframe and at an attractive price, so a 12-month deadline is eminently achievable.

Additionally, Sim Local is ready to provide international travellers coming into Ireland with local connectivity (through Irish MNOs and MVNOs) but this requires eSIM technology to be deployed as opposed to physical SIM cards in order to be most effective.

Sim Local therefore welcomes this action.

Action 2: ComReg to develop Guidance on OTA switching for Consumer Mobile

In line with Action 1, having a central body providing clear guidance, makes a great deal of sense. Given Sim Local and NetLync's expertise with the technology, we would of course be happy to assist with this action if required.

Sim Local therefore welcomes this action in line with Action 1.

Action 3: MNP Committee to conduct MNP Review within 6 months of the ComReg's finalised Action Plan

There is a clear link between a customer moving from one provider and another and a need to retain their mobile number in that process. Number portability is already a completely digital process and now, with eSIM, moving from one provider to another is now also a completely digital process. Marrying the two processes is an obvious next step, providing the consumer with a seamless and expedient digital experience (ideally in less than a minute or two).

Sim Local therefore also welcomes this action in line with Action 1.

Action 4: Potential actions for NRAs to facilitate M2M switching

Sim Local has the view that the consumer is far removed from the actual connectivity management of M2M connections, which are typically B2B arrangements. Therefore, there is little need for ComReg to make changes with how this market currently operates, other than to ensure mobile network operators also offer M2M subscriptions via eSIM technology in addition to consumer connections.

Sim Local welcomes this action as described.

Action 5: Launch an awareness campaign promoting the benefits of eSIM to industry and consumers

Sim Local believes that successful execution on Action 1 will prompt sufficient promotion to consumers (via the mobile network operators), but it is also beneficial for ComReg to have material ready for both businesses and consumers.

Sim Local therefore welcomes this action.

Action 6: Monitor MVNO access to OTA provisioning

Sim Local observes that MVNOs in many cases are beholden to their host MNOs for new services, including eSIM. This represents a real barrier to them in the market, and could result in MNOs inadvertently locking out MVNOs from the market if those MNOs have not enabled their MVNOs for eSIM within a reasonable timeframe.

Sim Local expects device OEMs to begin removing the SIM slot from their products within the next year or two (because it is only really then that those device OEMs enjoy the benefits of eSIM in their smartphone products – i.e. recovering extra space in the device).

Sim Local therefore welcomes this action, but expects ComReg to start monitoring soon and act quickly based on what they happening in the market (for example, a major device OEM readying to launch an eSIM-only device).

Action 7: ComReg to gather data on eSIM adoption and activation

Sim Local welcomes this action in order for ComReg to be in a position to act as required.

Action 8: Promote consideration of OTA by BEREC/CEPT

eSIM technology has been designed for use globally, and all efforts applied by ComReg and its partners are equally applicable to other world regions.

Sim Local therefore welcomes this action.

Action 9: Future review of issues

Sim Local welcomes this action.

Finally, thank you for your efforts so far to ensure that the consumer is able to benefit from what we believe is a wholly welcome next evolution of SIM technology, and we are happy to support ComReg on any of the above actions if required, given our extensive knowledge and expertise on the topic.

Kind regards,

Gary Waite, Head of eSIM Strategy

6 Tesco Mobile Ireland Limited



Mr Donnacha Hennessy
Commission for Communications Regulation
One Dockland Central
Guild Street
Dublin 1

BY EMAIL: donnacha.hennessy@comreg.ie; marketframeworkconsult@comreg.ie

17 December 2021



Dear Donnacha,

COMREG CONSULTATION RE: OTA PROVISIONING AND eSIM





I refer to ComReg's consultation regarding its proposed strategy to promote Over-the-Air (OTA) provisioning, including a related report from WIK Consultants:
<https://www.comreg.ie/publication/comreg-strategy-to-promote-over-the-air-provisioning>;
<https://www.comreg.ie/publication/annex-wik-report-on-strategies-to-promote-over-the-air-provisioning> (the "Consultation" and "WIK Report", respectively).

Tesco Mobile Ireland Limited ("Tesco Mobile") welcomes the opportunity to respond to the Consultation. Subject to the following comments, Tesco Mobile supports OTA provisioning and eSIM for the reasons set out in the Consultation:

1. Tesco Mobile is deeply concerned about the loss of customer choice OTA provisioning potentially represents (with equipment manufacturers controlling customer access to network operators). In the absence of regulation, equipment manufacturers could monetise access and/or favour their own networks/services to the disadvantage of smaller networks/MVNOs similar to other technology companies e.g. https://ec.europa.eu/commission/presscorner/detail/en/ip_21_2061. In the US, Apple currently confers a clear competitive advantage on large network operators by promoting network connectivity as follows:

Connect to a carrier now.

We'll work with your current carrier to activate your new iPhone so you can keep your existing number and rate plan.

 <p>\$399.00 or \$16.62/mo. for 24 mo.* before trade-in</p>	 <p>\$399.00 or \$16.62/mo. for 24 mo.* before trade-in</p>
 <p>\$399.00 or \$16.62/mo. for 24 mo.* before trade-in</p>	 <p>\$399.00 or \$16.62/mo. for 24 mo.* before trade-in</p>
<p>Connect on your own later.</p> <p>\$399.00 or \$16.62/mo. for 24 mo.* before trade-in</p>	

In the “*worst case scenario*”, equipment manufacturers could even exclude smaller networks/MVNOs. Equipment manufacturers have demonstrated in the past that they do not wish to deal with smaller networks/MVNOs. [3 < ...]. There is no guarantee that they will not do so in the future.

2. WIK shares these concerns (referring to them over 40 times in their report; describing them as significant¹ and a key barrier²) and recommends:
 - a. In view of the potential for companion devices and consumer IoT (‘Internet of Things’) in particular to be subject to lock-in (if no interface is provided to enable switching), ComReg could establish guidelines or rules which require OEMs (original equipment manufacturers) or connectivity providers which sell devices bundled with pre-installed connectivity to clearly specify the initial and ongoing charges associated with that connectivity and the means by which consumers can switch their connectivity provider.
 - b. If transparency proves to be insufficient in addressing this potential problem, ComReg could also initiate a review of SIM locking procedures and consider a prohibition on SIM locking.
 - c. At a European level, ComReg could complement the activities in its home market by working with other regulatory authorities to:
 - o Gather EU-wide data on eSIM availability and take-up across different devices and service providers; and

¹ At page IV of the WIK Report, WIK states: “*In addition to the direct impacts on end-users, eSIM could also have a significant impact on the underlying ICT value chain. A significant effect is that it enables equipment manufacturers and OSS providers such as Apple, Microsoft and Google (as well as car manufacturers) to engage in the process of providing or bundling connectivity. This could give device manufacturers a degree of control over which connectivity options are offered and how they are presented, which may raise potential lock-in concerns. Due to the lack of standardisation in this area, device manufacturers may also be able to control which mobile service providers can support companion devices, which could also impact competitive dynamics in mobile markets*” [Emphasis added].

² At page IX of the WIK Report.

- Produce EU-wide best practice guidelines on: (i) the promotion of OTA processes and switching; and (ii) addressing potential lock-in concerns.³
3. On this basis, we urge ComReg to:
 - a. Clearly acknowledge and address this concern in its Response to Consultation;
 - b. Respond to WIK's recommendations, addressing whether it has any binding authority over OEMs;
 - c. Investigate what remedies are clearly available to it to address these concerns under the electronic communications regulatory framework, competition law and/or the upcoming Digital Markets Act (<https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52020PC0842&from=en>);
 - d. Identify and advocate for any new powers that might be required in order to address these concerns; and
 - e. At a European level, promote EU-wide best practice guidelines on addressing potential lock-in concerns.
 4. Failure to address Tesco Mobile's concerns, shared by WIK, would involve promoting a change in technology without having proper regard to the long-term implications for customers, including " ... excessive pricing, inadequate quality and service standards".⁴
 5. In this regard, we note that ComReg: (i) has only examined the challenges [identified by WIK] evident in the Irish market and actions relevant to ComReg in addressing these challenges;⁵ and (ii) does not refer to "SIM locking and/or other solutions to address 'after-market' issues for devices bundled with connectivity"⁶ in its report. Tesco Mobile submits that the lock-in challenges identified by WIK in its report (and by Tesco Mobile in this correspondence) are evident in the Irish market (by virtue of the past behaviour of OEMs and other technology companies) and that there are actions relevant to ComReg in addressing these challenges and concerns. If applicable, ComReg should clarify why it believes that these challenges are not evident in the Irish market and/or there are no actions relevant to ComReg in addressing these challenges. Given WIK has referred to lock-in concerns over 40 times in its report, and described them as significant and a key barrier, Tesco Mobile submits that it is critical that there is regulatory clarity in respect of how these concerns are going to be addressed before ComReg proceeds any further.

Please see attached our responses to ComReg's specific consultation questions. If you have any questions or would like to discuss, please do not hesitate to contact me.

Yours sincerely,

(bears no signature as sent by email)

MARK HUGHES

Sent on behalf of Tesco Mobile Ireland Limited

³ At pages 138 – 139 of the WIK Report.

⁴ At page 133 of the WIK Report.

⁵ At footnote 100 of the Consultation.

⁶ At page X of the WIK Report.

ANNEX – CONSULTATION QUESTIONS⁷

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?

Tesco Mobile does not have any comments in respect of this section.

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?

The Use Case groupings described and outlined by WIK would appear to be comprehensive.

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?

Not that we are aware.

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

As we do not provide M2M services, Tesco Mobile does not have any comments in respect of this section.

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?

Forecasts of increased eSIM deployment and activation would appear to be sensible.

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?

For the reasons set out in our cover letter, Tesco Mobile does not agree with ComReg’s analysis of the competitive effects of eSIM and OTA provisioning on competition in mobile markets. No such competition analysis can be complete without addressing Tesco Mobile’s lock-in concerns. Given WIK refers to lock-in concerns over 40 times in its report, and describes them as significant and a key barrier, Tesco Mobile believes that it is critical that there is regulatory clarity in respect of how these concerns are going to be addressed before ComReg proceeds any further.

⁷ Please note that certain consultation questions were removed because they were incomplete or appeared to be repetitious, and the numbering of the questions reflects this.

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

Please see our response immediately above.

Environment

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

Tesco Mobile believes that eSIM and OTA Provisioning should have a positive effect on the environment.

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

Please see our response immediately above.

Security

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

Tesco Mobile believes that it is incumbent on all relevant stakeholders to take appropriate steps to ensure the security of their services.

Vision

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

For the reasons set out in our cover letter, Tesco Mobile is not in a position to agree with ComReg's Vision for OTA provisioning. Failure to address Tesco Mobile's lock-in concerns, shared by WIK, involves promoting a change in technology without having proper regard to the long-term implications for customers, including "... *excessive pricing, inadequate quality and service standards*".⁸

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

Please see our response immediately above.

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

Please see our response immediately above.

⁸ At page 133 of the WIK Report.

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?

Please see our response immediately above.

Actions

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

For the reasons set out in our cover letter, Tesco Mobile is not in a position to agree with the Actions proposed by WIK which ComReg is minded to adopt. Failure to address Tesco Mobile's lock-in concerns, shared by WIK, involves promoting a change in technology without having proper regard to the long-term implications for customers, including " ... *excessive pricing, inadequate quality and service standards*".⁹

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

Please see our response immediately above.

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

Please see our response immediately above.

Q21: Are there further actions which ComReg should consider?

Please see our response immediately above.

Guidance

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

For the reasons set out in our cover letter, Tesco Mobile is not in a position to agree with the Guidance for OTA provisioning proposed by ComReg. Failure to address Tesco Mobile's lock-in concerns, shared by WIK, involves promoting a change in technology without having proper regard to the long-term implications for customers, including " ... *excessive pricing, inadequate quality and service standards*".¹⁰

Q22: Are there any additional matters relating to Over-the-Air Switching which ComReg [presumably: should take into account?]

Please see our response immediately above.

⁹ At page 133 of the WIK Report.

¹⁰ At page 133 of the WIK Report.

7 Three Ireland (Hutchison) Limited

Over-the-Air Provisioning

**Response to Document 21/114 from
Three**

17th December 2021



Three.ie

1. Introduction

Since the 2nd generation of mobile phone was introduced with GSM standards, the means of identifying a device for access to the networks has remained largely unchanged. The physical SIM card provides this function and has been hugely successful in allowing an easy means to change mobile phone number and account information from one device to another. Apart from some relatively minor improvements in function and form-factor though the SIM Card is still essentially the same as it was in the 1990s. Technologies have progressed considerably in the intervening period, both in the end user devices themselves and in the supporting networks. It is now possible to securely move end-user information between devices without the use of a physical SIM card at all. This will make the process of switching devices or switching operator easier for end users in many cases and there is no doubt that the next couple of years will bring significant growth in this area, although the physical SIM Card will continue to play an important role in holding customer identity for a considerable time to come.

The market for use of eSIMs is still relatively young but emerging. We don't yet know where it will prove to be most popular or where it will have the greatest impact. The drivers will vary depending on the end use application and this will influence the rate of adoption. A high-end smartphone is an expensive device that is personalised by the end user and usually in their possession. It is not changed very frequently and the process to swap a physical SIM card might not be seen by users as a significant element in the process of upgrading model. An IoT device is more likely to be low cost and not so easily accessible by the end user. In this case the process required to change a physical SIM card might be much more significant. Ironically, in the smartphone market it is the high-end devices that will have eSIM capability first.

Three welcomes ComReg's consultation document and we agree that it is timely to start considering some of the complex issues that will arise for eSIM and its impact on the switching of device and service provider. There are some matters that need to be clarified and having some degree of certainty on these matters early will help in the development and growth of OTA/eSIM. ComReg does need to be careful not to introduce any requirements or restrictions at this time that would inhibit competition or block entry. This is particularly the case for IoT/M2M and for secondary devices where there is room for non-MNOs to be active in the market, but also for traditional mobile service providers. MVNOs compete in the retail and service space rather than for provision of the underlying network. They often leverage their strength in logistics and distribution to differentiate their service, and the SIM card is an important part of this component to their service. ComReg needs to be careful not to introduce any mandatory requirements that would be a burden on either MVNOs or non-traditional telecom operators as part of this review. To do so would present a barrier to entry and would run counter to the objective of facilitating competition.

The mobile market in Ireland is competitive at this time as noted by WIK in their recent review *“The WIK Report notes that the Irish mobile market appears to be competitively served, and there does not seem to be an immediate need for intervention in the market by ComReg”*, (ComReg Doc 21/101). Porting of numbers and switching between providers is also functioning well: *“In Ireland, however, mobile number porting is amongst the fastest in Europe, with a low number of complaints and ports typically completed in a few minutes (with a requirement of not more than 2 hours)”*, (ComReg 21/114). Any changes or obligations that ComReg considers introducing will need to be checked against the current functioning of the market and the emergence of new types of service in a Regulatory Impact Analysis so as to make sure no harm is done to existing or emerging competition.

Regarding Ireland’s relative position for eSIM in either consumer mobile or IOT, we are of the view that it is too early to draw any conclusion. IoT in particular is still in its early growth phase and should be allowed to continue to do so.

Traditional SIM cards are simple and have lower cost – they should not be ruled out as a means to provide service as this would introduce a barrier to market entry which might have a greater impact than the switching barrier that ComReg is trying to address. Operators will decide for themselves whether and when to introduce eSIM, and to which class of product. While structure and certainty is required, ComReg’s remit should not go beyond facilitation – facilitation could involve removing a barrier to the introduction of eSIM where identified or to providing guidance to service providers.

WIK have estimated that 15% of smartphones are eSIM-compatible. This is still a relatively small proportion. A greater proportion of consumers of IOT devices are eSIM-compatible at 40% but ComReg should remember that there is a segment in this market that must remain low cost. Mandating eSim might be cost prohibitive for these cases.

There is considerable work to be done in planning the regulatory structure for eSIM. Three is currently the largest provider of services in Ireland that are eSIM based, and we will work with ComReg on these matters. It should be noted that at this time eSIM is not yet a lower cost option than traditional physical SIM cards. This might change in time but ComReg needs to be careful in considering how to facilitate or whether to mandate.

2. Response to ComReg Questions

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?

WIK has identified the right technical matters to begin the process of developing a structure for eSIM in Ireland. This is just the beginning though and issues will emerge as the work progresses.

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?

The WIK use case groupings are broad enough to capture the cases that are known at this time. The IoT market is still nascent though and new use cases will no doubt emerge in time.

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?

Three does not agree that there is any real lag in support for eSIM in Ireland. The use of this technology is still at the early stages and little conclusion can be drawn. In the consumer handset market only high-end devices support eSIM yet, and in the IoT market Ireland is ahead of its peers. Adoption of OTA by some of the bigger markets like China and Korea will be necessary to drive availability of mid-tier devices.

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?

Yes, the forecasts seem reasonable, however forecasts are difficult at the moment because we are at the early stage of the technology and the bulk of solution providers are at the stage of technology discovery before they design new solutions with eSIM or iSIM capable devices.

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?

As OTA can reduce switching time, service providers have a natural incentive to use it – as soon as it is compatible with their business model. In relation to MVNOs, Three agrees with WIK's view that, at present, no action is required to ensure eSIM support is provided by MNOs to MVNOS as eSIM support is not yet required to effectively compete in the market (noting eSIM only devices are not yet widespread). The use of SIM cards and eSIMs is primarily an aspect of the retail market, where MVNOs can differentiate their service. The availability of eSIMs could enable new entry but the application of mandatory requirements could also present a barrier to that entry. For this reason ComReg should be careful about introducing

regulatory requirements at this stage of the emergence of eSIM. The market has not had a chance to find its own solutions yet so providing guidance is probably how ComReg can best facilitate its development.

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?

While we do not disagree with the factors that ComReg has identified, it is difficult to say if this has been correctly quantified on both sides. Overall, we believe eSIM will have some environmental benefit, however when all aspects are considered including carbon effects of eSIM then the gains might be less significant than that identified by WIK. Three is committed to using technology to reduce environmental impact and overall our view is that eSIMs should be beneficial from an environmental point of view, however this is a marginal and incidental benefit and would not weigh heavily in the overall consideration.

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?

Yes, we agree with the analysis.

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?

It would not seem to be justified to attempt to impose OTA as a means to deliver number porting – number porting is already working in Ireland as is.

While OTA is technically feasible in some cases, it won't be in all cases, e.g. where handsets don't support it, or where the service provider does not have the infrastructure to provide it. It is not possible to separate technical and economic viability in a simple fashion – if it is not economically feasible for a particular service provider to support an eSIM platform then they won't have access to one and it will be technically infeasible. Mandatory provision of eSIM would rule this type of service provider out of the market with consequent loss of competition.

We agree that the promotion of eSIM is consistent with ComReg's statutory objectives but they do not support the imposition of cost on operators unless this has been analysed and shown to be proportionate in a Regulatory Impact Assessment (RIA).

It is too early to specify delivery targets at this time, however we have significant concerns with any target for OTA activation and switching to be provided within "*5 minutes from start*"

to finish". This might be suitable as a best case target, however switching service has many dependencies, including action by the customer. It is too early to specify hard targets at this time.

The integration of eSIMs/OTA with porting will need to be separately considered in detail. While we expect these two separate processes should be able to work in tandem we will need to be careful to avoid damage to the existing porting process. It is gaining-operator led, with validation that is appropriate to securing the user number while also allowing for fast porting. There have been a relatively small number of cases where numbers have been "hijacked". Where they have been then the process has been resolved by operators. We need ensure that moving to OTA does not introduce any new vulnerability into the porting process.

We note ComReg's offer to attend meetings of the MNP Committee, and Three supports this. It might be that a specific sub-group should be formed to examine the issues arising from eSIM and porting but that is a detail that can be quickly resolved.

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?

There are some operational and practical aspects of day-to-day customer management that are important to consider – when a mobile handset is damaged the user can easily extract the plastic SIM card and put it in another device on a temporary basis to immediately recover connectivity until their main mobile phone is fixed. This would not be so easy with eSIM and is something that might cause users to choose to continue with physical SIM cards for some time.

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

Q17: Are there further factors ComReg should consider in its Vision for Over-the-Air provisioning?

We note that the use of M2M/IoT devices in the B2B market usually involves professional buyers who well understand the technology and process. No action is needed to promote OTA to these customers.

In relation to consumer mobile devices, where a customer can choose to buy a device that has been subsidised by the operator then it is reasonable and sensible that the device should be locked. Clearly there is a process that must be followed to unlock the device with associated cost. ComReg should not confuse third party unlocking services with an operator's own unlocking process. Any move to require early unlocking would create an arbitrage opportunity for devices. Sale of devices is an open market with many users choosing to buy direct from manufacturers or from third parties. There are options available for consumers to obtain unlocked devices from new. An additional option is to obtain a locked device through the operator because the terms might be preferable to the user. ComReg should not

mandate that operators sell handsets at subsidised prices without a means to recover the subsidy. If sales of locked handsets was prohibited then this would introduce a barrier for some consumers to obtain current devices. It would not be an issue for wealthy consumers or corporate users and could introduce a new digital access divide for certain consumers.

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?

See further comments on the actions below.

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

We have some concerns that there is considerable work yet to be done to understand the implications of introducing eSIM across all markets and device segments. The impact of the interface with number porting is not known at this point so it is difficult to commit beyond stating that we would like to hit those targets. ComReg should not intervene in what is an emerging market, it is too difficult to predict which measures will be helpful and which will actually be a hindrance to its development. Guidance from ComReg would be helpful, however no hard requirements should be set.

Q21: Are there further actions which ComReg should consider?

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

The market for secondary devices should be left to develop for now – we don't want a regulatory barrier that would prevent non-MNOs from entering the market.

Cross-brand eSIM switching, e.g. Apple to Android this might present some particular challenges and needs to be considered.

3. ComReg's Specific Proposals

- **Action 1: Require fully-digital Over-the Air customer journeys for consumer mobile.**

This action, if adopted, would mandate MNOs to provide fully digital consumer activation, switching and porting journeys for eSIM-enabled smartphones within 12 months of ComReg publishing its response to consultation, the Action Plan and any supporting Decision(s).

We caution against setting hard deadlines or obligations at this time until the implications of such are fully understood.

- **Action 2: Develop guidance on OTA provisioning³ for Consumer Mobile**

ComReg would develop guidance (“Guidance for OTA provisioning for Consumer Mobile”) regarding the design and implementation of an optimised OTA product and processes to support fully-digital consumer journeys.

This is a sensible proposal and Three supports it.

• **Action 3: Requiring the industry MNP Committee to review existing MNP processes.**

This review would consider whether any improvements and changes are required to support OTA provisioning and to improve the porting process in general but in particular for the purposes of OTA provisioning, within 6 months of any Decision.

We agree that this review is necessary and welcome ComReg’s proposal to attend. It is difficult to agree to the timeline at this stage when we don’t know what is involved.

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

OTA may simplify M2M switching, enabling greater competition in M2M. ComReg considers that clear contractual terms may empower M2M customers to switch. Furthermore, internationally standardised OTA switching processes for M2M could be beneficial.

Making the contractual terms clear is supported, but not the mandating of eSIM in all cases through contractual terms.

• **Action 5: ComReg to launch an awareness campaign promoting eSIM to industry, organisations and consumers.**

ComReg would launch an awareness campaign concerning the benefits of eSIM for industrial, consumer and public sector.

This is a good idea and Three supports it.

• **Action 6: Monitor engagement between MVNOs and their hosts concerning eSIM support.**

This action will be conducted in line with ComReg’s ongoing monitoring of the competitive dynamics in the Irish mobile market, as specified in Information Notice 21/1014.

It should be noted that service provision including SIM card provision is one of the areas that MVNOs provide for themselves – it is part of the retail service provision activity and not in the network activity. It is one area where MVNOs can and do differentiate and it is an area where service providers from outside of the telecommunications industries can have advantages – e.g. logistics and digital distribution. It’s not necessary or justified to mandate MNOs to provide access to their retail facilities on a wholesale basis.

• **Action 7: ComReg to gather information and data on eSIM adoption and activation**

ComReg does not currently gather data relating to OTA device deployment and activation. Further information regarding eSIM deployment or activation would facilitate monitoring of the market and the evaluation of ComReg’s’ action plan.

Three agrees with his proposal.

- **Action 8: Promote consideration of OTA by BEREC/CEPT**

ComReg considers it appropriate to promote the report and its key findings (specifically those outlined above) to international regulatory bodies such as CEPT and BEREC and discuss how such bodies could further assist in overcoming potential challenges (e.g., oversight of multinational M2M operators).

This seems sensible.

- **Action 9: Future review and evaluation of developments in OTA provisioning.**

In order to promote OTA provisioning, ComReg considers it appropriate to review and evaluate developments in OTA as it deems necessary (but no later than 2026).

This seems sensible.

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8 Twilio Ireland Limited



Non-Confidential Version

ComReg Strategy to Promote Over - the-Air Provisioning

*Twilio's Response to the Consultation by the Commission for Communications Regulation
Published on 8 November 2021 (ComReg 21/114)*

17 December 2021

1. About Twilio

- 1.1 Twilio is a leading global CPaaS provider and is registered as an Electronic Communications Service (**ECS**) Provider in the Republic of Ireland. Twilio provides services to more than 235,000 enterprises globally and powers more than 1 trillion interactions between them and their customers every year.
- 1.2 Twilio's software allows customers to communicate with their customers over voice, SMS, messaging, or email thanks to the communications capacity that companies have added into applications across a range of industries, from financial services and retail to healthcare and non-profits.
- 1.3 For instance, Twilio powers the communications for New York City's contact tracing initiative. The services enable city authorities to communicate with COVID-19 patients, educate them on the virus, and identify their close contacts through self-reporting. The platform also provides messaging-based alerts using Twilio Voice, SMS, email or WhatsApp that prompt patients to fill out secure surveys on their symptoms.
- 1.4 Other customers include Irish and international brands. Many of Twilio's customers are also small and medium-sized enterprises and Twilio's social impact arm, [Twilio.org](https://www.twilio.com/social-impact), supports charitable organizations to deliver their communications needs.
- 1.5 Within the Republic of Ireland, Twilio serves a number of customers, some examples of which are set out below:
 - Irish startup WhatClinic is a website for consumers to find, compare and book healthcare services. With Twilio, it tracks conversion rates in over 160 countries.
 - The AirBnB subsidiary Luckey, a host management company managing everything from booking to cleaning to meeting the next guest, has decided to use Twilio's fully-fledged contact center services due to their initial positive experience with Twilio voice communications.
 - Crisis Text Line a free, 24/7, confidential messaging service for people in crisis, funded by the Health Service Executive (**HSE**) that quickly connects teens and adults struggling with suicidal thoughts, addiction, and other crises with counselors trained to help through a Free Text Short Code.

2. Executive Summary

- 2.1 Twilio welcomes the opportunity to provide feedback on the Commission for Communications Regulation's (**ComReg**) consultation on the ComReg Strategy to promote over the air provisioning published on 8 November 2021 (**Consultation**).

- 2.2 Twilio has some comments to make about ComReg's competition assessment. In particular, Twilio notes that there appears to be a contradiction between ComReg's reliance on expected competition between MNOs and MVNOs as a result of introducing OTA provision, when in fact such competition may not materialise because ComReg has also made a decision not to require MNOs to support eSIMS or OTA provisioning for MVNOs but left this to the commercial decision of MNOs.
- 2.3 Twilio also notes that while mandating of completely digital journeys for consumers, ComReg does not clearly define consumers. Are these merely residential customers or is the definition a broader one and meant to encompass other customers who may be using mobile devices outside of M2M.
- 2.4 Twilio is concerned that ComReg is seeking the Mobile Number Portability Committee (**MNP**) to address questions around the MNP process that go well beyond the mere updating of the MNP process to include OTA. Twilio suggests that if ComReg considers that there are more fundamental issues with the MNP process these should be addressed separately through a public consultation.
- 2.5 In addition, Twilio queries the effectiveness of proposed Action 4 in terms of requiring MNOs to put in contractual provisions dealing with a range of matters around OTA switching.
- 2.6 Twilio also notes that there is an ever increasing reliance on virtualisation of numbers which in itself offers the benefits of a completely digital journey for customers. As virtualisation grows and becomes more commonplace, ComReg must continue to monitor how number portability rules remain technology neutral in light of new ways of utilizing numbers.
- 2.7 In this response, Twilio does not answer every question posed by ComReg rather it addresses those questions where Twilio has specific comments to make. Twilio's decision not to respond to any particular question raised by ACMA does not necessarily represent agreement, in whole or in part with the consultation.
- 2.8 Please do not hesitate to refer any questions or remarks that may arise as a result of our comments to:

Twilio Ireland Limited
Attention: Twilio Global Telecoms Team
Address: 25-28 North Wall Quay, Dublin 1, Ireland
Email: regulatory-notices@twilio.com

3. Response to Questions

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?

- 3.1 Twilio notes that whilst ComReg and WIK's assessment of the competitive benefits of eSIM and OTA on competition on mobile markets includes a number of areas where they suggest there will be increased competition between MVNOs and MNOs in the form of **"Opportunities for new or existing MVNOs to either increase market share or provide new or differentiated services; • Greater wholesale competition, as MVNOs benefit from greater bargaining power, being more easily able to switch host MNO"** the existence of this heightened competition rests solely on ComReg's assumption that MNOs will commercially offer eSIM and OTA to MVNOs.
- 3.2 At paragraph 93 ComReg states "ComReg agrees with WIK's view that, at present, no action is required to ensure eSIM support be provided by MNOs to MVNOS as eSIM support **is not yet required to effectively compete in the market (noting eSIM only devices are not yet widespread). This should ideally be delivered by commercial negotiations between MNOs and MVNOs, noting that MVNOs have already received access to eSIM support in a number of countries.**" Whilst the reference is to a number of countries the only example cited by ComReg is WindTre in Italy which offers eSIM to 2 MVNOs.
- 3.3 Twilio suggests that there is contradiction in the reliance by ComReg on the competition to be generated between MVNOs and MNOs so as to justify mandating OTA provisioning for MNOs for consumers when a large part of those so called competitive benefits would rest on a purely commercial decisions of the MNOs to offer eSIM and OTA to MVNOs. This is particularly the case given that ComReg itself notes that **"ComReg is mindful that the Irish market is behind its peers in the deployment of eSIM and notes that Ireland remains among the few European countries lacking widespread eSIM support among MNOs"**.

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

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

Q21: Are there further actions which ComReg should consider?

- 3.4 Action 1 is that ComReg is minded to require that MNOs provide eSIM support for consumer mobile to enable fully digital consumer journeys for consumer mobile. Fully-digital OTA consumer journeys involve MNOs offering the following:
- OTA activation (e.g., sign-up);
 - OTA switching processes; and
 - OTA MNP.
- 3.5 Twilio notes that this action would be limited to MNOs and that there would be no obligation on MNOs to offer support to their MVNOs to allow them to provide a digital journey with ComReg leaving this to be negotiated commercially between MNOs and MVNOs. This may cause customer confusion if an MVNO cannot offer a digital journey and the competition that ComReg envisages as developing between MNOs and MVNOs may therefore be delayed.
- 3.6 Twilio would also note that the increasing virtualisation of numbers by cloud service providers already offers customers a completely digital journey. As the OTA and virtualisation landscapes develop, ComReg must be sure that its rules remain technologically neutral.
- 3.7 Action 2 is ComReg's proposed guidance on the digital journey for MNOs for Consumer Mobile.
- 3.8 Twilio notes that in both Action 1 and Action 2, there is no definition of consumer in the document apart from a reference in paragraph 5 to "eSIM device penetration in Ireland is currently low for consumer use cases ("Consumer") such as smartphones and smartwatches". Twilio would suggest that ComReg needs to define who is a Consumer for the purpose of action one and action two and clarify whether this only applies to residential customers using mobile devices for purposes outside their trade, craft, profession or business or whether it is a broader definition of consumer that might take into account small businesses and not for profits.

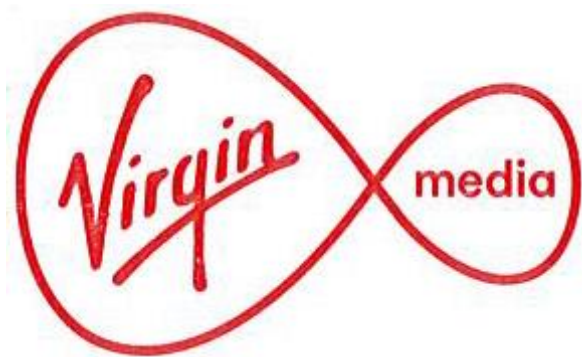
- 3.9 Action 3 is that within 6 months of a decision on the proposal by ComReg, the industry's MNP committee would review existing MNP processes to identify any changes or improvements needed to the MNP process to work with OTA provisioning.
- 3.10 Twilio notes that the industry's MNP committee is to review the MNP process but that the questions being asked include questions which are broader than the mere introduction of OTA into the MNP process alongside SIM porting and could potentially lead to changes to the MNP process beyond OTA. These broader questions are:
- How well is Irish MNP working at present?
 - What improvements, if any, can be made to the Irish MNP process to improve customer satisfaction (e.g., speed, reduced non-completed ports)?
- 3.11 Twilio notes that any changes as a result of these questions have the potential to impact MVNOs who are not and may not be engaged in OTA provisioning. Twilio suggests that the questions that the MNP Committee is being asked to consider should be limited to those questions that are relevant to the introduction of OTA provisioning.
- 3.11 Twilio respectfully submits that if ComReg believes that there are broader issues with the Irish MNP process that require amendment that it address that within a separate public consultation in which all parties who are interested in that topic would be involved.
- 3.13 Action 4 is for ComReg to 'Develop guidelines/ rules on minimum contractual conditions to better facilitate M2M switching processes.'
- 3.14 In the consultation document at paragraph 142 ComReg notes that "M2M use cases are business-to-business ("B2B") services, that switching is typically conducted on a project basis and subject to contractual terms. Therefore, the full realisation of the benefits of OTA provisioning to M2M customers and end-consumers depends not only on MNOs OTA provisioning processes and associated M2M customer journey. It also depends on how clear, effective and enforceable contractual provisions are, in order to ensure successful and timely M2M switching is achieved. At present, there is no minimum criteria for the contractual provisions relating to switching in M2M contracts. This situation risks the delay or elimination of some or all of the full benefits of OTA provisioning to M2M customers of OTA provisioning."
- 3.15 ComReg therefore suggests that "it may be beneficial for to require MNOs to provide a minimum level of information on the procedure for M2M customers using OTA provisioning to initiate a successful and timely OTA switch which should be clearly defined in the terms of the contract, including but not limited to the following:
1. The actions to be taken by parties (customers, transferring and donor provider) in the event of a switch.
 2. The "best efforts" expected of the donor or transferring provider.

3. An estimate of the duration of switching.

4. An estimate of the cost, if any, of switching.”

- 3.16 ComReg justifies this on the basis that the information would enable M2M customers to switch in a timely and cost effective manner, and that the change comes at no discernible cost on the basis that any efforts on the part of MNOs to provide estimates of the duration or cost of a switch would be required in the event of a switch.
- 3.17 ComReg has not provided any detail of how this requirement would be drafted and Twilio notes that it is difficult to see how this requirement will work in practice given that in paragraph 192 ComReg indicates that it does not consider it necessary to require support for OTA provisioning for M2M cases. Twilio therefore assumes that the obligation will need to be restricted so as to only apply to those MNOs who are voluntarily offering OTA switching for their M2M cases.
- 3.18 Twilio also assumes that the restriction will need to be geographically limited to MNOs who are supporting OTA provisioning for M2M cases located only within the Republic of Ireland. This is because as ComReg itself notes, international M2M cases would require international coordination.
- 3.19 Twilio also queries how useful the provisions would be in practice and in particular how practical it would be to give an estimate of the duration and the cost of the switch at the time of entering into the contract, given that the number of M2M services covered by the contract may vary over the life of the contract as the customer adds services to meet for eg growing demand.
- 3.20 In addition, at the start of the contract it is not clear whether a customer will require a switch of all the services to a single provider or may for example wish to split various services amongst various providers.
- 3.21 Given these factors it appears that only the most basic assessment of cost and duration could be made at the beginning of the contract and that this would need to be heavily caveated by the MNO to give it the ability to reflect the actual position when the switch was requested.
- 3.22 As such it is not clear to Twilio what benefit such a caveated assessment would offer an M2M customer and whether including this as part of the contract gives any real benefit to a M2M customer in the way suggested by ComReg.

9 Virgin Media Ireland Ltd



Virgin Media response to:

Consultation: ComReg Strategy to Promote Over- the – Air Provisioning

ComReg 21/114

20 December 2021

Summary

Virgin Media Ireland Limited (**‘Virgin Media’**) welcomes the opportunity to respond to ComReg’s Strategy to Promote – Over- the Air Provisioning (**‘the Consultation’**).

Over-the Air Provisioning has many complexities and requires significant upfront investment. While complexities ultimately may be addressed, this is not possible in the timeframe put forward by ComReg for delivery of over the air provisioning. It is evident that prior to engaging on its over the air provisioning strategy ComReg is very mindful of complexities, hence its engagement of WIK to produce what is a detailed report. Virgin Media would urge ComReg to continue with this prudent approach when deciding on timelines for introduction of what is a very complex and new provisioning process.

Virgin Media is concerned that the position of an MVNO is not really addressed in this Consultation or in the WIK report. What could therefore be seen as a benefit for consumers may in fact have the opposite effect where MVNO’s are not seen as a key player and are left behind . We provide more detail on this point in our submission and would ask ComReg to consider the role of MVNO’s very carefully when making any decisions.

Virgin Media has responded to the questions asked by ComReg in the next section. For ease of reference we have summarised our main points below.

Section 1: Summary of main points

- Timelines proposed by ComReg for implementation of over the air provisioning are not realistic given complexity involved. Standards are not fully developed and those that are, are not mature. Complexity of process is not fully explored. The WIK report is purely focussing on the ESIM backend systems and ESIM, but not on the impact on surrounding systems. Introduction of ESIM requires an entire redesign of current SIM delivery processes including the coexistence of ESIM and physical SIMs. These changes have a significant impact on IT systems of operators.
- MVNO’s are largely forgotten in this consultation and therefore could be disadvantaged. Reference is made to dependency on ONO’s and reaching commercial agreement with ONO’s. It would be a shame if what should be an innovative provisioning solution for consumers, results in less competition in the market, where MVNO’s are unable to compete.
- To deliver an ESIM solution requires substantial investment and is a disproportionate cost when considered against an MVNO’s scale in Irish mobile marketplace when taken against a timeline of quarter two 2022. Costs involved are in many instances the same for an MVNO as they are for an MNO, making over the air provisioning uneconomic when compared against the scale of the MVNO. For example many MVNOs will require a fully own deployed ESIM solution for network and IT..
- ComReg is proposing that MNOs implement over the air provisioning within 12 months of publication of its Decision following this consultation expected timeline quarter two 2023. The unintended consequence of such a fast role out is that MVNOs will be left behind as the proposed solution is MNO driven and MVNO’s given costs and complexity are very unlikely to be in a position to offer over the air provisioning within such a short period of time.
- The WIK report points to success of mobile number portability in Ireland, it seems very strange that ComReg would look as part of an extremely complex initiative to revisit what is and continues to be one of the regulatory success stories. The Irish mobile number portability process enables seamless switching between all operators in the mobile market, MNO and MVNO alike providing a level playing field.
- While much is made of the benefit for M2M services, the underlying costs of competing in this market are not covered. MVNO’s are not able to compete with MNOs in the M2M market given high barriers to entry. For an MVNO therefore the benefits outlined for M2M services do not exist.

- Device OEMs may prepopulate ESIM with potential MNOs per country to select from when booting the device. Smaller MNOs and likely MVNOs will have a significant disadvantage compared to market leaders who will have more leverage to get OEMs to list them first on a device. Risk is smaller players like MVNOs get left behind.
- Consultation makes no reference to market dynamics which the large device manufacturers will be able to control. (For example Apple or Samsung can preconfigure preferred operators (expected to be the larger MNO's with more leverage, creating difficulties for other providers).
- ComReg when setting timelines for over the air provisioning need to consider what other industry projects are ongoing at the time, for example internet access switching. The same resources are used for all of these initiatives and operators do not have infinite resources and/or personnel to manage many regulatory projects at the same time.
- Rushing to implement something that is new and complex will not work. Security requirements are paramount and must be given the attention they deserve. A rush to market with something where standards are not complete will only cause issues for consumers and will not meet high security standards that are an obligation on industry.

Section 2. Response to Consultation Questions

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?

- (i) Chapter 3 of the WIK report describes the eSIM solutions (M2M and Consumer) together with their architectures. Virgin Media is of the view that there are gaps in this technical background for the following reasons:

Standards have not been fully developed to support multiple companion devices and potential to use multiple profiles simultaneously. This means that consumers cannot get the full benefit of eSIM as they will continue to be dependent on physical SIMs if they want to use multiple profiles simultaneously. Furthermore, consumers cannot leverage the value of companion devices absent the necessary standards. Table 8-1 on p133 of the WIK report acknowledges these challenges.

Even where standards are developed to support multiple companion devices, then the likely requirement for Entitlement Servers on the operators end needs to be acknowledged. Virgin Media believes this needs to be covered in more detail including in the architecture diagrams especially as secondary devices is seen as one of the main use cases of eSIM.

- (ii) It is clear from the technical descriptions provided by WIK that the size of the investment in the infrastructure to deliver eSIM is significant, although no order of magnitude of costs is indicated in the WIK report. In addition, there are further high costs associated with the business process re-engineering required to deliver the use cases via an optimal customer journey to optimise the benefits of eSIM. What is not mentioned is that potential costs for an MVNO will be similar to those of an MNO. When considered against the smaller scale of an MVNO these are uneconomic particularly given the tight timeline proposed by ComReg.
- (iii) The WIK report is purely focussing on the eSIM backend systems and eSIM, but not on the impact on surrounding systems. Introduction of ESIM requires an entire redesign of current SIM delivery processes including the coexistence of ESIM and physical SIMs. These changes have a significant impact on IT systems of operators.
- (iv) Security is a major aspect as companies would need to introduce measures to make sure that ESIM activation credentials are only sent to the party requested the eSIM credentials. EG email delivery of QR codes opening new fraud options in the context of email spoofing, etc. Security and the development of a secure solution must be a top priority for any project such as this.
- (v) Virgin Media notes that Section 5.2.2. of the WIK report (p85) acknowledges the important challenge for MVNOs of the cost of investing in eSIM solutions in addition to challenge brought about by potential dependencies on the Host MNO. While the challenge is noted, no proposal is put forward to counteract these challenges and it would seem from a review

of paragraphs 86 to 93 of the Consultation that the role of MVNO's and any impacts on them is largely discounted.

“Another important challenge for MVNOs is the cost of investing in eSIM solutions. Interviews suggest that established consumer MVNOs may make the transition later than MNOs and are likely to do this only as a defensive mechanism, once the transition towards digital subscriptions via eSIM is complete. This problem was also observed in a 2018 market study by the Australian regulatory authority ACCC89 which identified that the delay in MVNO support for eSIM was caused by the need for investments in IT platforms for MVNO use, which need to be developed together with the hosting MNO. This issue is also likely to be relevant for European MVNOs.”

- (vi) It might have been useful also for Chapter 3 to outline the technical infrastructure (and associated order of magnitude of investment) in order to deliver a minimum viable eSIM solution.

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?

- (i) What we see in the WIK report are known use cases. New use cases will most likely emerge over time. However, it seems that while the known use cases are documented, it is not clear how they can all be delivered.
- (ii) P9 (section 9) of the consultation document calls out that *“Consumers are also likely to have an increased requirement for secondary services (e.g. multiple numbers per handset)”*. However, given the incomplete standardisation, that requirement cannot currently be met by eSIM alone (and will only be properly met through eSIM if a consumer can have two profiles active simultaneously). Consequently, a dependency remains on Physical SIM to satisfy consumers requirements per handset (Physical SIM for one or both numbers or Physical SIM for one number and eSIM for the other).
- (iii) Furthermore, it is important to note that while page III of the WIK report describes that connectivity in secondary devices is part of the main consumer use case for eSIM, page IX of the same document calls out that the necessary standards aren't there to support this use case :

“Further development on standards should also be encouraged to support simultaneous multiple profiles and standards for entitlement servers to support choice in connectivity for secondary devices as well as improved switching processes for M2M.”

This deficit in agreed standards is acknowledged through the WIK report and summarised on Table 8-1 (p133) addressing Challenges and associated harm for consumer eSIM and OTA.

Should device OEMs prepopulate ESIM with potential MNOs per country to select from when booting the device. Smaller MNOs and more likely MVNOs will have a significant disadvantage compared to market leaders as they likely will have significant leverage to get OEMs to list them first on a device.

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?

(i) eSIM requires a huge investment on the behalf of operators both in technical investment and in business process reengineering. We note that according to the WIK report Interviews conducted for this study suggest that a timeframe of between 18 months to 2 years may be needed for MNOs to establish their own eSIM solutions. While it is suggested that faster solutions maybe available through eSIM management providers, it is preferable to support operators in finding the solution that works best for them and for their customers taking into account the end to end customer journey and business processes needed to support that journey. eSIM is coming but operators should be supported in delivering it at the pace that suits them and their customers rather than risking forcing MSPs to deliver 'faster solutions' via eSIM management providers, that may in turn generate a sub-optimal customer journey.

(ii) Furthermore, while multiple profiles can be stored on an eSIM, the current GSMA specification allows only one eSIM profile to be active at any one time. This is a barrier to adoption and as noted in the WIK report (p97) :

"...Customers with eSIM enabled phones today typically rely on the physical SIM for their primary connection. Most owners of eSIM equipped smartphones do not activate the eSIM but instead use the physical SIM card. Where eSIM is used, this is typically to add one or multiple eSIM profiles as secondary subscriptions"

(iii) As long as the GSMA specification only allows one eSIM profile to be active at a time, consumers will most likely keep subscribing to physical SIM in the case where a customer requires separate lines for different purposes. Users will meet their objective by toggling between either eSIM and Physical SIM or Physical SIM and Physical SIM (in the case of Dual SIM). This is likely preferable to going through the hassle of deactivating one eSIM profile in order to use another (there is also likely a cost associated with activating and deactivating profiles).

(iv) Also, a big advantage of eSIM and OTA is the ability to support multiple companion devices but the standards are not developed to support those. So that opportunity is missed or certainly not taken sufficient advantage of.

(v) Virgin Media would again reiterate our point made in response to question 1 above there is a high technical complexity for IT systems, requiring significant time and investments in addition to the introduction of ESIM backend infrastructure.

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

- i. For MVNO operators the M2M use cases are largely irrelevant as this sector has very high barriers to entry and therefore any benefits of ESIM for M2M use cases are flawed when taken in MVNO context.

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?

- (i) The lack of standards including (ref Table 8-1 page 133 of WIK report) : Lack of support for Multiple Enabled Profiles ; Lack of fit-for-purpose industry standards on device entitlement services and Lack of adherence to a reasonable common standard for eSIM needs to be acknowledged, the forecast outlined appears to assume that these issues will be resolved, which is not necessarily the case at least within the short timelines assumed for implementation.
- (ii) The challenges to implementation (lack of support, lack of user-friendly OTA provisioning, poor awareness, limited industrial support, lack of standards to support multiple companion devices and ability to use multiple profiles simultaneously) will all impact reaching these forecasts.
- (iii) Under WIKs base case scenario, around 28.3 million devices in Ireland will be equipped with eSIM in 2030, and 27 million will have been activated. This is a 1.4% share of all eSIM devices in the EU and anticipated rates of growth above the EU average (from the current low base). The assumptions around the activation levels are highly ambitious given the challenges outlined, many of which are outside an operator's control, especially around the lack of standards that will impact growth in eSIM usage and development of the use cases outlined.
- (iv) ComReg p9 (section 9) Consumers are also likely to have an increased requirement for secondary services (e.g. multiple numbers per handset). That requirement will only be properly met if can have two profiles active which the standards do not currently support.

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?

- (i) No, Virgin Media does not agree for the following reasons. While it may benefit competition between Mobile Service Providers there is a high risk that with the deployment of a solution as complex and expensive as this, will result in MVNO's being left behind and therefore the important competitive impetus that MVNO's have brought to the market will be diminished. There is also a risk that customers will jump from one operator to another without fully thinking through their decision and may subsequently look to move back to their previous provider.
- (ii) MVNO's are very much disadvantaged in what ComReg is putting forward particularly given the proposed tight timeframe for implementation. To deliver an ESIM solution

requires substantial investment and is a disproportionate cost when considered against scale of MVNO's in the Irish mobile market place and this timeframe. Costs involved are the same for an MVNO as they are for an MNO, making OTA an uneconomic . This sentiment is also copper fastened by ComReg's comment that no action will be required of MNPs to ensure eSIM support for MVNOs.

- (iii) ComReg is proposing that MNOs implement over the air provisioning by quarter two 2023, likely consequence being limiting the ability of MVNO's to compete as the proposed solution is MNO driven and MVNO's given costs and complexity are very unlikely to be in a position to offer over the air provisioning within such a short period of time.
- (iv) It is noted that the potential creation of 'out-of-the-box' offerings present a downside that could hinder competition (WIK Report p129):

“The device comes pre-installed with connectivity from a certain provider. “Out of the box” connectivity solutions might in particular be offered with certain wearable devices or consumer IoT solutions . However, it should be noted that while connectivity “out of the box” may support ease of use initially, this solution could present lock-in problems for the end-user, if there is no easy way for the consumer to switch his provider. This may be the case particularly if the interface on the device concerned does not allow for switching, or makes it challenging to execute, and if it is also not possible to switch the connectivity provider via another device”

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

- (i) There is a threat to the positioning of Mobile Service Providers who are likely to be more distanced from their customers with OEMs wedging themselves in the middle between the customer and the MSP. Notwithstanding this, it is important that customer retain their relationship with their operator in order to ensure that they get the customer service that they need. However, If the role of the traditional operator is diluted this generates a risk of operators not being able to compete in the same way as they did before – which will reduce choice and competition. Greater consideration needs to be given to impacts that the device manufacture will have preferring certain MNO's to others and leverage that larger operators will have with manufacturers.

Environment

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

- (i) The analysis clearly demonstrates the environmental benefits of reducing the use of Plastic SIM cards and of the fact that eSIMs have a smaller environmental footprint through reduced packaging, logistics and sales activities and through enabling smaller device sizes. However it fails to take account of another use case such as Dead on Arrival (DoA) which would require an entire replacement of the device rather than a SIM swap like in the past, which likely will have adverse environmental benefits.

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

- i. No, there is no reference to any negative environmental impacts associated with the digitalisation associated with eSIM and these need to be considered.

Security

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

- i. Some of the obvious issues associated with physical SIMs are eliminated by eSIM but as outlined in the report new forms of Fraud and security issues may arise over time.
- ii. Timelines for eSIM must also cater for a complete security analysis to ensure that what is developed is a secure solution to ensure secure delivery of ESIM credentials to customers which are tested and meet cyber security standards.

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

- i. This question is not clear? What ComReg and industry must ensure is that eSIM is developed in as secure a manner as possible. Security should not be compromised by swift timelines for implementation of a solution where high testing of processes and systems must be put in place to ensure no security weaknesses. Security professionals need to be engaged to ensure a full end to end review.

Vision

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

- (i) Overall the 8 principles in the vision make sense and outline how the benefits of eSIM can best be unlocked for MNOs, however these need to look at impact on MVNO's in more detail and should be reconsidered with MVNO's in mind.
- (ii) The huge level of investment and business process re-engineering required to deliver eSIM on the part of MSPs should be acknowledged and MSPs need to be allowed sufficient time to deliver eSIM according to the guidelines. They should not be forced to launch eSIM according timeline that risks delivering sub-optimal OTA processes as a result of the rush to get a solution launched by a mandated deadline.
- (iii) We repeat points made in response to question one above re necessary standards being in place (please refer to paragraph i. of our response under question 1). This is a critical step in order for the vision to be realised.
- (iv) Security – needs to be a key consideration in eSIM delivery. This needs to be one of the overarching principles, current reference is to should /rather than must.

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

- (i) The 8 factors show how the benefits of eSIM can be unlocked but the level of investment and business process re-engineering required by MSPs to deliver on this vision must be taken into account and the timetable for implementation needs to fully consider complexity involved. Virgin Media again refers ComReg to our points made at Section 1 above where we document difficulties for MVNO's around costs, complexity and market dynamics. We would urge ComReg to give these issues due consideration to ensure that ComReg's overall vision delivers in a way that best meets the needs of all end users.
- (ii) Delivery of ESIM credentials must be safe and secure likewise OTA provisioning must (not should) be safe and secure.

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

- (i) The delivery of standards to support multiple companion devices and potential to use multiple profiles simultaneously.
- (ii) Further consideration needs to be given to what are incomplete standards at this time and those that are in place are immature.

(iii) Impacts for MVNOs needs to be considered further, failure to do so could have very adverse consequences for MVNOs.

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?

- (i) The potential challenges exist for a myriad of reasons. For example, in identifying "Lack of eSIM support by MSPs or insufficient choice of providers" it must be acknowledged that delivery of eSIM requires a huge investment in both technology and business process reengineering on behalf of MSPs. In parallel, the current physical SIM solution has served consumers very well and will continue to do so as long as the standards aren't in place to leverage the full benefits of eSIM (e.g. standards to support multiple companion devices and potential to use multiple profiles simultaneously).
- (ii) Given that there are guidelines documented and international benchmark solutions in place for the delivery of user-friendly OTA provisioning and/or switching options it is hard to see that there is a potential challenge here, other than that MSPs risk delivering sub-optimal user journeys (and supporting back end processes) if put under too much time pressure to deliver OTA/eSIM too quickly.
- (iii) Poor awareness of OTA and eSIM is not necessarily a challenge now given that there is so little use of eSIM in Ireland. Once MSPs start to roll out eSIM it is our belief that awareness levels will accelerate.

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

The 8 factors show how the benefits of eSIM can be unlocked but the level of investment and business process re-engineering required by MSPs to deliver on this vision must be taken into account and the timetable for implementation needs to fully consider their views and requirements. This is in the interest of delivering upon the factors in a way that best meets the needs of all end users and as mentioned throughout Virgin Media's submission does not counter the positive role that MVNO's have brought to the market.

Q17: Are there further factors ComReg should consider in its Vision for Over-the-Air provisioning?

OTA requires a level of teck-saavy among consumers. There will always remain a cohort of consumers who will not want to sign up or switch via OTA. Therefore, even when the standards are eventually in place fully support eSIM, processes will likely need to remain in place in parallel to support the continued use of eSIM.

Actions

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

Action 1 : Require fully-digital Over-the Air customer journeys for consumer mobile.

- (i) The timelines being imposed via this action are not taking sufficient account of MSPs concerns. According to the WIK report Interviews conducted for this study suggest that a timeframe of between 18 months to 2 years may be needed for MNOs to establish their own eSIM solutions. The delivery of eSIM requires significant investment in both technology and business process re-engineering and mandating an earlier timeframe risks suboptimal customer journeys being developed. The delivery of eSIM should not have to be rushed in order to meet an unrealistic timeframe. Solutions for eSIM are based on highly complex network and IT delivery requiring significant changes on IT with huge investments associated. Based on experience from other countries this requires a minimum of 18 – 24 month to deliver.

Action 2: Develop guidance on OTA provisioning³ for Consumer Mobile

- (ii) This is welcome but full and final guidance needs to be provided before Action 1 can be mandated. This guidance must be delivered before the design work kicks off for the development of fully-digital Over-the Air customer journeys for consumer mobile. Otherwise, MSPs risk find themselves in a position where, in order to meet a mandated timeline, they have started to design a fully-digitised OTA customer journey that does not adhere to the guidance because the guidance is not provided in a timely manner. This can lead to unnecessary cost and delays if the MSP has to subsequently re-design. Clarity is therefore required as to whether the guidance provided in Section 5.3 of the consultation document is full and final and won't be subject to change. Virgin Media recommends that any guidance published by ComReg should be done following this consultation with interested parties being given a further opportunity to comment.

Action 3: Requiring the industry MNP Committee to review existing MNP processes.

- (iii) The WIK report identified that the MNP processes in Ireland are “OTA-ready” as they already operate without manual intervention and could work with an eSIM just like they do with regular SIM cards. They note also that *“in the future, MNP processes could in theory be combined with profile switching, but there does not seem to be any significant demand for this solution at this time”*.

It therefore seems that requiring the existing MNP process to be reviewed within 6 months of any decision is putting an unnecessary burden on the industry. The need for any such review should be evaluated at a later stage. This is a process that works well and therefore it does not make sense to revisit it.

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

- (iv) See Virgin Media’s comments re M2M for MVNO’s above in response to question 4.

Action 5: ComReg to launch an awareness campaign promoting eSIM to industry, organisations and consumers.

- (v) This is a good idea if done in line with when all MSPs are ready to launch eSIM provisioning. .If it is done earlier it could give an unfair advantage to operators who already have eSIM, in addition you could see increased number of care contacts

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

(vi) We would like to understand exactly what is meant by this monitoring. It is noted that “the action will be conducted in line with ComReg’s ongoing monitoring of the competitive dynamics in the Irish mobile market, as specified in Information Notice 21/101”. This information notice highlights two concerns where monitoring may be warranted but these relate to data services rather than OTA.

- Where future competition in the high data volume bundles part of the market is not sustained, in particular as 5G services expand; and
- Where there is evidence that MNOs collectively are unwilling to agree to terms and conditions for MVNO access that allows MVNOs to compete in the high data volume bundles part of the market

We note also that on page 37 of the ComReg consultation (section 93) that ComReg states, with reference to p136 of the WIK report, :

“In relation to MVNOs, ComReg agrees with WIK’s view that, at present, no action is required to ensure eSIM support be provided by MNOs to MVNOs as eSIM support is not yet required to effectively compete in the market (noting eSIM only devices are not yet widespread)”.

However, we can find no such statement on P136 of the WIK report. We note that p136 of the WIK report states that :

“As Ireland is lagging its European neighbours in embracing eSIM technology, ComReg could usefully.... monitor the availability and take-up of eSIM as well as the conditions under which MNOs provide eSIM support to MVNOs.”

We note also that page 137 of the WIK report states that :

“The targets of the obligation to provide OTA provisioning and switching for consumer use cases, which should include all MNOs in the first but not yet MVNOs in view of MVNOs’ dependence on eSIM support from their hosts and the high level of investments required in relation to their customer-base”

We cannot, from this, conclude that it is WIKs view that “no action is required to ensure eSIM support be provided by MNOs to MVNOs *as eSIM support is not yet required to effectively compete*”.

It is noted by ComReg and WIK that MVNOs may need MNO support to deliver eSIM, and it is clearly a priority of ComReg to ensure that eSIM is rolled out in Ireland in order to promote competition. Yet in the above statement ComReg draws the conclusion that eSIM support is not required for MVNOs to effectively compete. If all MNOs in Ireland deliver eSIM, and MVNOs need support from MNOs to deliver eSIM and that support is not forthcoming, then MVNOs will not be able to compete on a fair playing field as they will not benefit from the advantages of eSIM as outlined in both the Consultation Document and the WIK report.

Furthermore, if MVNOs are expected to deliver eSIM according to the timeline outlined in the Consultation Document and if those MVNOs are dependent on support from MNOs to do so, if that support is not forthcoming in a timely manner, then, due to circumstances outside of their control, it will be impossible for MVNOs to deliver on that requirement.

Action 7: ComReg to gather information and data on eSIM adoption and activation

(v) No comment.

Action 8: Promote consideration of OTA by BEREC/CEPT

(vi) This would be useful in the Consumer space, if it would help address the challenges presented by the lack of standards to support multiple companion devices and potential to use multiple profiles simultaneously.

Action 9: Future review and evaluation of developments in OTA provisioning.

(vii) More information on how this review and evaluation would be carried out would be helpful.

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

(i) The timelines specified in Action 1 are excessively tight. MSPs that were interviewed by WIK outlined a necessary timeline of up to 2 years to deliver eSIM. This is therefore a more realistic timeline. It is not clear also if MVNOs are bound by this timeline but if, as acknowledged, in the report there is a dependency on MNOs then the timeline outlined is going to be very difficult for MVNOs achieved.

- (ii) Furthermore, while Action 2 is justified and likely welcome, clarity is needed as to whether that guidance is considered by ComReg to be already provided via this consultation paper.
- (iii) Action 3, feels overly burdensome when the MNP process is already seen to be working well. It does not feel justified at this time.
- (iv) Action 5 would be welcome once all MSPs including MVNOs have eSIM as to do it any earlier would give an unfair competitive advantage to those operators who have launched.
- (v) It is not clear exactly what Actions 6 and 9 will involve. More information is needed on this.
- (vi) Regarding Action 7, depending on how the data is used it may be justified.
- (vii) Action 8 would be useful if it helped deliver the required standard.

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

- (i) The timelines being imposed for Action 1 are not taking sufficient account of MSPs concerns. According to the WIK report Interviews conducted for this study suggest that a timeframe of between 18 months to 2 years may be needed for MNOs to establish their own eSIM solutions. The delivery of eSIM requires significant investment in both technology and business process re-engineering. Mandating an earlier timeframe risks suboptimal customer journeys being developed. The delivery of eSIM should not have to be rushed in order to meet an unrealistic timeframe.
- (ii) Furthermore Action 2 needs to be delivered upon in advance of Action 1 being mandated. This guidance, if provided, must be delivered before the design work kicks off for the development of fully-digital Over-the Air customer journeys for consumer mobile. Otherwise, MSPs risk find themselves in a position where, in order to meet a mandated timeline, they have started to design a fully-digitised OTA customer journey that does not adhere to the guidance because the guidance is not provided in a timely manner. This can lead to unnecessary cost and delays if the MSP has to subsequently re-design.
- (iii) Regarding Action 3, it seems that requiring the existing MNP process to be reviewed within 6 months of any decision is putting an unnecessary burden on the industry when they need to prioritise focusing on implementing OTA itself. The need for any such review should be evaluated at a later stage.

Q21: Are there further actions which ComReg should consider?

- (i) Further consideration should be given as to how to drive agreement on international standards to support multiple companion devices and potential to use multiple profiles simultaneously in order to support the use cases identified for which eSIM will deliver much consumer benefit. Is this something that ComReg can assist in?

Guidance

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

- (i) Given the complexity of processes involved, it would be prudent for ComReg on foot of responses to this consultation, to consider responses received and thereafter publish its findings and ask interested parties for further comment.

Q23: Are there any additional matters relating to Over-the-Air switching which ComReg

Not that we are aware of at this time.

10 Vodafone Ireland Ltd



Vodafone Response to Consultation

ComReg Strategy to promote Over-the-Air provisioning

Reference: ComReg Doc 21/114

Version: [Non-Confidential]

Date: 17/12/21

Introduction

Vodafone acknowledge the opportunity to respond to ComReg Doc 21/114 calling for inputs on ComReg's overarching strategy for Over-The-Air (hereinafter 'OTA') provisioning. This approach of early stakeholder engagement to understand OTA use cases for different target customers, the ecosystems involved, the benefits and challenges for stakeholders is to be welcomed. We have provided detailed answers to consultation questions below.

In summary:

- **With two important exceptions Vodafone agree that most of the actions are consistent with the requirement under the EECC to promote OTA provisioning.**

Vodafone broadly agree with proposals on guidance, the proposal that the MNP committee should review switching (however timing proposed should be extended), the proposal on awareness, the plans to monitor OTA, the proposal to gather eSIM adoption and activation data, if this is not overly complex, the requirement to promote consideration by BEREC and CEPT and the plans for future review.

However,

- **ComReg should not require or 'mandate' fully digital OTA consumer journeys.**

This is proposed to occur within 12 months of ComReg's finalised action plan. Irish industry has demonstrated its willingness to innovate in OTA M2M services. It is premature to suggest that there could be a delay or elimination of some or all the benefits of OTA for Irish consumers. The ecosystem supporting eSIM in consumer markets is developing rapidly at a global level and is extending to Ireland without question.

Vodafone will be a lead operator in deployment of OTA for consumers as is already the case in many of our markets, including Ireland. Vodafone Ireland provides eSIMs now having launched eSIM activation delivery profiles to eSIM devices over the air in July 2021.

Vodafone are happy to discuss OTA plans further in confidence with ComReg.

[CONFIDENTIAL TEXT REMOVED]

- **A more pragmatic approach is required for M2M**

We would urge against any porting requirement for M2M as the number is of limited or no value to the individual end-user. In addition, many M2M services provided in one country will consume numbering resources from other member states and porting requirements would not apply. On standardised switching for M2M the network is just one component of what are more complex end to end customer solutions and the aspiration of a standardised process, over and above that which is facilitated by existing GSMA standards development, is not warranted or indeed achievable.

Consultation Questions

Technical Background

Question 1: 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?

Vodafone Comment: It is important in promoting OTA that the technical detail can be translated into detail that end-users can understand. This should inform awareness initiatives, guidance etc. Customers may hear different terms Over-the-air or Remote Sim Provisioning ('RSP') or eSIM and it is important to be clear in this regard.

In relation to the key take away regarding two different GSMA specifications it should be noted a third set are in development (SGP .31/SGP .32).

A further important technical matter in the promotion of OTA is the promotion of standards for MNO platforms ensuring interoperability with other MNOs and MVNOs in running OTA campaigns.

Regarding porting the WIK paper states

'In the future, from a technical perspective MNP processes could be combined with profile switching, using a mechanism whereby the MNP handler and SM-DS are combined, but operators have not as yet expressed a need for such a solution'

We are not clear at this stage if this would be required and would question the technical rationale given the eSIM provisioning systems are subsystems to an operator's BSS and HLR which would assign the subscriber data to the MSISDN.

Vodafone Ireland already support embedded eSIM having launched eSIM activation delivery profiles to eSIM devices over the air via QR Code in July 2021. The statement that there is a lack of MNO support is not accurate in the context of this release and further enhancements ongoing.

Use Case

Question 2: 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?

Vodafone agree with use cases listed. In relation to the M2M switching complexity new standards SHP.31 SGP.32 will eliminate some complexity as migrate in/migrate out will be simplified and smaller IoT customers will gain access to eSIM services as complex integration between SM-DP and SM-SR is no longer required.

A further use case to note for M2M eSIM is the ability for global customers to deploy global solutions which include highly regulated markets such as Brazil and China. eSIM can facilitate more seamless switch to local providers where needed as part of one global customer solution.

eSIM deployment and activation in Ireland

Question 3: 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?

Vodafone Comment: Ireland is not lagging. There is clear MNO support in Ireland for OTA M2M use cases. The consumer use cases are also developing, and Ireland will adopt eSIM without question. The priority at this time should be to harmonise with developing standards so as not to increase costs and raise challenges around cooperation and interoperability of different solutions and platforms, which could hinder uptake.

It is appropriate for the Irish telco sector and the promotion of OTA that we monitor closely ongoing developments, bearing in mind OTA use cases and the potential impact on inter-operator processes. As part of the EU Code the industry is engaged on switching processes focussing on Internet Access Services, and developments in OTA will need to be considered as part of this process.

Vodafone support ComReg engagement on OTA with a comprehensive study which clearly promotes adoption in Ireland. Notwithstanding that fact, this is very much a developing EU and global market it is far too early for Ireland to consider in isolation any mandate in consumer markets for the following reasons:

- There is a high investment required by MNOs which requires planning.
- A regulatory mandate may act as a barrier to entry for some MNOs/MVNOs.
- The device market, in particular the high-end consumer device market is already now moving now towards OTA and consumer demand will drive adoption.
- The global rollout of eSIM has been staggered with an initial focus on larger markets that deliver the scale to justify the significant investments required from MNO's, MVNO's OEMs, solution developers, retailers, customers etc.

OTA is in the market in Ireland and its further promotion can take care of itself, providing there are no technical, competitive or regulatory obstacles. Vodafone support embedded eSIM having launched eSIM activation delivery profiles to eSIM devices over the air via QR Code in July 2021. The statement that there is a lack of MNO support is not accurate. [CONFIDENTIAL TEXT REMOVED]

Question 4: Is the deployment and activation of eSIM for M2M use cases in Ireland ahead of that in comparable countries? Why/why not?

Vodafone Comment: Ireland was proactive in the deployment of eCall which was implemented in a short timeframe, based on a collaborative approach, adopted by industry with the regulator and

government. That project highlights the innovation in short term that can be actioned when there is a common direction of travel and clear standards. The use of eCall in Ireland is growing as the car market evolves. The market is moving on OTA and measured promotion of OTA as opposed to intervention is important in this context.

Forecasts

Question 5: 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?

Vodafone Comment: Vodafone is of the view 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.

Competition

Question 6: 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?

Vodafone Comment: The competitive effects in M2M could also include the benefit of being able to avail of multiple connectivity options at the same time rather than the customer being limited to a single connectivity provider. This will ensure greater resilience.

In addition, eSIM also allows global customers to deploy global solutions that include highly regulated markets such as Brazil and China. eSIM can facilitate more seamless switch to local providers when needed as part of one global customer solution.

Question 7: Does the description of the competitive effects of eSIM and Over-the-Air consider all relevant impacts? If not, what should be included?

Vodafone Comment: The promotion of OTA and any competitive assessment should consider the pivotal role of the network and the need for fair return on investment for network providers. The network is essentially the platform that brings together the device manufacturers, end-users and content and application providers. In this broader market an MNO/MVNO must be able to justify the investment across network and operating systems and maintaining control of timing and prioritisation of investment is important. A staggered or slow rollout of OTA is not an indication of a competition issue.

An operator should also retain control of timing and deployment of eSIM/OTA in customer journeys to ensure it is optimised to deliver the best customer solution. This ensures a customer journey that is simple and easy across the lifecycle from activation, porting, change of eSIM profile, handset replacement, deactivation, handset/secondary device lost or stolen etc. The requirement to meet a

set regulatory deadline will inhibit the operator's ability to optimise its investment, to align with group development cycles and to deliver the best digital solution.

There are significant regulatory demands on the investment cycle for the coming years (EU Code, ECSMs, 5G etc) and further mandates are not required especially when evidence shows the market is moving in the right direction.

Environment

Question 8: Do you agree with the analysis of the environmental effects of eSIM and Over-the-Air?

Vodafone Comment: Vodafone has committed to halving its environmental impact by 2025 and the introduction of eSIMs also eliminates the need to manufacture and ship the associated plastic, thereby reducing carbon emissions.

Question 9: Does the description of the environmental effects of eSIM and Over-the-Air consider all relevant environmental impacts?

Vodafone Comment: The telco sector will play important role in achieving national objectives to halve carbon emissions over the current decade. The Irish government has stated its intention to use 5G technologies to drive a greener more Innovative Ireland and they will use 5G to enhance connectivity and service provision. OTA is already a core component in the M2M solutions that will assist the government in achieving its plan. For example, the national recovery and resilience plan has allocated €55m to decarbonisation of enterprises, foreign and indigenous owned, which includes incentives on the installation of Energy Metering and Monitoring Control Systems.

Security

Question 10: Do you agree with the analysis of the security of eSIM and Over-the-Air provisioning standards and processes?

Vodafone Comment: The sector will need to be vigilant to any new forms of fraud and collaborate to address promptly.

Question 11: Does the analysis of the security of eSIM and Over-the-Air provisioning standards and processes?

Vodafone Comment: No comment

Vision

Question 12: Do you agree with the Vision for Over-the-Air provisioning proposed by ComReg?

Vodafone Comment Vodafone agree in principle with most of the vision with some exceptions, specifically on M2M. The role of ComReg in promoting OTA should be to ensure an open and competitive ecosystem. In time, some intervention may be required if issues are identified but as it stands the experience for the customer is aligned, and indeed enhanced, with that experienced on a physical SIM.

Furthermore, our view is that measures already in existence will ensure this vision can be achieved. For example, consumers will get all information necessary as provided for under the EU Code, switching should be safe and secure, provisioning will enable new forms of devices, activation and switching will be as fast and easy as possible, as is already the case in Ireland.

Porting: A concern does arise around portability for M2M. It is clear that MNP should not apply to M2M. A consumer eSIM solution will comprise 1 customer with 1 activation of 1/2/3 devices whereas a business M2M solution could be 1 customer with hundreds of thousands of devices across many countries.

Usually numbers are not recognised by the end-user or the OEM. The number will play a role for certain services such as e-Call but there is no value to the individual end-user.

This has been acknowledged in ComReg Document 18/46 (Par.93-96):

'Number portability may not be relevant to switching service providers in an M2M context. This is partly due to the broader set of actors present in the M2M value chain as compared with P2P value chain, i.e. the existence of M2M service providers and M2M users (such as car manufacturers or electricity suppliers).'

And in relation to OTA that

'ComReg notes the broad agreement that over the air (OTA) provisioning is relevant, and remains of the view that industry is best placed to decide on the appropriate technological solution to develop for switching.'

A further consideration is that M2M services in Ireland might be provisioned based on extraterritorial numbers (e.g. numbering resources from the Spanish numbering plan) or might be provisioned based on global (ITU) numbering resources. In both cases, an obligation to port in and to port out these numbers within Ireland would not apply. We therefore suggest ComReg align with 18/46 and exclude M2M services from MNP considerations.

Switching: We must avoid the creation of barriers around switching and acknowledge the inherent complexity in some solutions. It is impractical to suggest a massive switching project must be established between gaining and losing operators when the level of integration behind corporate end to end IOT solutions are so complex.

There is also a greater degree of complexity in switching in B2B M2M services and prescriptive intervention in the absence of a competition issue must be avoided. Many B2B M2M solutions will be bespoke and will involve tailored connectivity and customers side features. This will include features such as country footprint, differences in quality (such as availability of various networks), differences in security and APN configurations.

Switching from one M2M connectivity provider to another provider therefore is a highly complex process, since the customer might request slightly different features from the receiving carrier,

compared to the services the customer obtains from the giving carrier. This can be very different to a consumer mobile scenario, where the products are more inter-changeable.

It should be acknowledged that bespoke solutions required considerable investment to put capabilities in place for customers and these costs must be recovered by MNOs and switching processes should not undermine this investment.

Question 13: Do you consider the 8 factors to be well specified?

Vodafone Comment: Please see comments above

Question 14: Are there further factors ComReg should consider in its Vision for Over-the-Air provisioning?

Vodafone Comment: The vision could be somewhat focussed on OTA from a process perspective. The customer experience is critical, and the customer perspective is not related to OTA, it is that they get connectivity in an efficient and effective way. It is important therefore that connection is easy, simple, digital and customer friendly and the customer needs to have full visibility of connected devices, the ability to add/remove devices and to have full overview and control.

Challenges

Question 15: 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?

Vodafone Comment: The challenges as presented may be potential in theory but don't practically exist at present. As outlined above there is clear support in the sector in Ireland for OTA. It is well established in M2M and launched in consumer. All Vodafone European markets support eSIM and markets are constantly working to improve eSIM capability.

We note there will be needs to consider OTA as part of existing industry practices. In terms of actions raised below we support the review by the MNP committee, albeit within a longer timeframe. We would also suggest consideration at other industry forums including the Internet Access Switching industry collaboration that will be needed as part of Code implementation and other appropriate forums.

For example, clear guidance should be provided on interaction with Emergency services on secondary devices. These matters can be discussed at the appropriate ECAS forums where capability and requirements can be aligned.

Question 16: Do you consider the 8 factors to be well specified? If not, please explain how your views differ.

Vodafone Comment: Please see answer to Question 12

Question 17: Are there further factors ComReg should consider in its Vision for Over-the-Air provisioning?

Vodafone Comment: The vision must support sustainable industry investment and cost recovery by MNOs.

Actions

Question 18: Do you agree with each of the Actions proposed by WIK which ComReg is minded to adopt?

Vodafone Comment: We address each of the actions below

Action 1: Require fully digital Over-the Air customer journeys for consumer mobile within 12 months of ComReg's finalised Action Plan

We do not agree with this action mandating a specific timeframe for 'fully digital' OTA.

As evidenced in M2M the market will deliver OTA solutions and industry must align to global industry standards and ensure a harmonised approach to take account of developments in other Member states. For reasons of scale, Ireland may be at a later stage in the development cycle for consumer OTA however the trends cannot be avoided. The concern driving this action is stated to be support by MNOs however Ireland has launched consumer journeys and all operators must position to support developments in the device and consumer wearable market to compete.

The position regarding 'fully digital' OTA journeys is not specified, and, in our view, this exists already for Vodafone Ireland. Consequently, no mandate is required. Early intervention in this way could undermine the end-user, innovation and competition objectives as operators are forced to work to a regulatory target as opposed to a development cycle. We must note complexities that arise in different countries which need to be factored into central development programmes and mandates on timing can mean Ireland is limited in its ability to avail of group solutions.

There are requirements across all Member States that need to be taken into account and Ireland feed into this process. This complex process is ongoing, and mandates have the potential to limit opportunities at a national level. For example, in some countries when switching from one provider to another, it is not only the inter-provider process, that determines the user journey. In various EU and EEA countries, there is also other regulation that has an impact. In particular, the KYC processes that apply to mobile services, which can involve in some countries complex processes about ID verification (in-shop ID processes or video ident processes). This can impact or limit the benefits of a mandated OTA process.

Action 2: ComReg to develop Guidance on OTA switching for Consumer Mobile

Whilst maintaining the view of no requirement to mandate we agree that guidance is useful and specific topics will need to be addressed, such as the example on Emergency call treatment in Ireland, potential fraud topics etc. Vodafone remains ready to engage with ComReg as needed and our group experts are always available to bring our broader opco experience to this discussion. The guidance detail provided as part of this consultation is somewhat broadened to detail include wider policy areas such as handset locking, and separate industry engagement is warranted on these matters.

Action 3: MNP Committee to conduct MNP Review within 6 months of the ComReg's finalised Action Plan.

Vodafone agree an MNP review is warranted and would request a longer timeframe for the review. We should afford a 12-month timeframe for this review as there will also be discussions ongoing on Internet Access Switching and GNP to ensure Code compliance in parallel. Vodafone agree the MNP committee should engage ComReg as required as part of this review.

Action 4: Potential actions for NRAs to facilitate M2M switching

This warrants much deeper consideration and a standardised process for M2M OTA switching is not appropriate currently. A cautious approach is needed as solutions develop. When rules are embedded in specific countries this can stifle innovation. For example, in certain countries local SIMs have been made mandatory which means solution changes, extended lead times and added costs for customers rolling out in that country.

The complexity of a solution on the end customer side cannot be accounted for in a standardised switching process. Furthermore, many customers may look to develop multi profile solutions for resilience and cost reasons. This already delivers seamless customer-controlled switching.

We would urge ComReg to hold the pragmatic position in document 18/46 that industry is best placed to decide on the appropriate technological solution to develop for switching. A broader switching discussion is also taking place at industry level in the context of the Code.

Regarding customer contracts these are already provided for under the Code and further layers of intervention are not required at this time.

Action 5: Launch an awareness campaign promoting the benefits of eSIM to industry and consumers

Vodafone agrees with this action as educating the customer of the benefits of eSIM will be important to fuel uptake. For less technology savvy customers, it will be a new concept to learn and adapt and it's important that the onboarding of eSIM is fast and easy. If consumers struggle with the set up and usage of eSIMs, the adoption of the technology will slow down. Hence, education of customers is important.

Action 6: Monitor MVNO access to OTA provisioning

Vodafone agrees with this action.

Action 7: ComReg to gather data on eSIM adoption and activation

Vodafone agree with this action provided it is a reasonable data collection requirement and is integrated with existing reporting requirements.

Action 8: Promote consideration of OTA by BEREC/CEPT

Vodafone agree with this action and advocate a standards-based approach.

Action 9: Future review of issues

Vodafone agree that to promote OTA ComReg should keep matters highlighted under review and that this action as opposed to Actions 1 and 4 are more appropriate at this stage of the development cycle for OTA in Ireland.

Question 19: Do you agree with the justification given by ComReg for each of the Actions proposed by WIK which ComReg is minded to adopt?

Vodafone Comment Please see response to question 18. We support ComReg engaging and promoting OTA but do not agree with mandates proposed in Action 1 or standardised switching processes for M2M in Action 4. We would urge against any prescriptive intervention at this time.

Question 20: Do you agree with the envisaged timeline for each of the Actions proposed by WIK which ComReg is minded to adopt?

Vodafone Comment: Please see response to question 18. Vodafone do not agree with a mandate or 12-month lead time. In addition, we would suggest a longer lead time for MNP review in Action 3.

Question 21: Are there further actions which ComReg should consider?

Vodafone Comment: As above specific issues will need to be raised at different industry forums and or discussion groups including the Internet Access Switching industry group and the ECAS forum.

Guidance

Question 22: Do you agree with the Guidance for Over-the-Air provisioning proposed by ComReg?

Vodafone Comment: This document should form part of a further consultation, taking into account this consultation inputs. Issues of broader policy such as Handset locking views seem to be coming into the promotion of OTA dialogue and more detailed engagement is required.

Question 23: Are there any additional matters relating to Over-the-Air switching which ComReg..

Vodafone Comment: No Comment

ENDS