

WIK observations regarding responses to the ComReg consultation on OTA provisioning

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Bad Honnef, 18.05.2022

Imprint

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1 Comments regarding the technical background

Stakeholder comment	WIK response
<p>Vodafone questions the necessity and rationale behind the integration of MNP and OTA switching described by WIK in paragraph 3.6.3 of the study. Vodafone further considers that SGP.31¹ and SGP.32 will simplify some of the complexity WIK describes in relation to the difficulties in M2M switching.</p>	<p>We observe in the study that MNP and OTA switching processes can be carried out independently, and that operators in the Irish market stated that they were satisfied with current processes. We note that a patent application has been submitted by Samsung for integrated MNP and remote SIM provisioning, and that this could enable faster or easier switching, but also observe that it is not possible to confirm whether this would be the case at present. We note the limited interest in this solution from network operators and the GSMA at present, and that suggest that integrated solutions could be further explored if interest emerges and if the current factors which may limit the applicability of this solution change.</p> <p>The analysis in our report is based on specifications that were in place in 2021. We take note that SGP.31 may simplify some of the complexity we identified in relation to IoT/M2M switching. SGP .32 had not yet been published as of beginning May 2022.</p>
<p>Mobilise agrees with WIKs description of the relevant technical matters and suggests further consideration of:</p> <ul style="list-style-type: none"> • Cloud Platform Systems, such as Amazon Web Service (“AWS”); • The role of OEMs in facilitating eSIM in-App provisioning • Electronic Know Your Customer (“eKYC”) services. 	<p>We have considered the role that could be played by OEMs in the context of eSIM, and in this context highlighted that OEMs could play a gatekeeper role, for example by influencing connectivity partners (see section 5.2.4 of the study). Preferencing of this kind could be implemented “out of the box” or via pre-installed applications. The soon to be adopted EU Digital Market Act contains provisions (Article 6(6)), which could be used to address issues of this kind.</p> <p>We have made reference to Electronic Know Your Customer services as a possible method of digital ID verification (See Footnote 197).</p> <p>With the introduction of 5G technology, there is a trend towards telecom operators cloudifying their mobile network architecture and services to meet 5G service requirements. As regards eSIM rollout, WIK does not expect that there will be a “specialized” AWS cloud platform system that offers or includes “only eSIM services”, However such platforms could be offered to third parties or eSIM facilitators in the context of cloud as a service. This is however unlikely to affect the main conclusions of the report.</p>
<ul style="list-style-type: none"> • Virgin Media submits that WIK’s technical description does not take into consideration that: • secondary device use cases are undermined by deficiencies in the current eSIM standards (e.g., a consumer requires a physical SIM to gain the benefits of 	<p>These points are addressed in various places within the report.</p> <p>We address in a number of places challenges linked to the imitation of current eSIM standards to support multiple enabled profiles. For example:</p> <p>Page 70 “Another challenge linked to the lack of support for simultaneous use of multiple eSIM profiles under the current GSMA consumer specification, is that, if consumers do not have a physical SIM card alongside the eSIM, they may</p>

¹ For eSIM Consumer and IoT specifications, please see <https://www.gsma.com/esim/esim-specification/>

Stakeholder comment	WIK response
<p>multiple enabled profiles)</p> <ul style="list-style-type: none"> standards do not yet support multiple profiles or multiple companion devices; operators will continue to require device entitlement server for companion devices; and there will be an impact on SIM delivery processes, including coexistence of SIM and eSIM. 	<p>need to manually deactivate and activate the different profiles in order to benefit from the different services”.</p> <p>We also note (page 78) that “Current eSIM specifications do not allow for multiple profiles to be active simultaneously via the eSIM. However, as the OTA switching process enabled by eSIM is an instantaneous process, some dual SIM use cases can be, at least to some extent, realized just with the eSIM itself. In addition, as the GSMA specifications are still evolving, future eSIMs may be capable of fully acting as dual SIM in the traditional sense with multiple active profiles”.</p> <p>We make multiple references to the need for entitlement services for companion devices (in particular for Apple devices) and associated challenges. For example:</p> <p>Page 12: “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.”</p> <p>Page 57: “The second consumer use case concerns secondary devices. In practice, this currently includes mainly wearables, and more specifically smartwatches, as well as cellular connectivity in computers (tablets/notebooks). This use case can be distinguished from the smartphones case as these devices do not require mobile number portability (with some exceptions) Secondary devices often involve a more complicated technical process for deploying profiles, as additional servers (entitlement servers) are necessary on the operator’s end”.</p> <p>Page 68:” The entitlement server has a direct connection with the customers equipment (smartwatch paired with smartphone). Other network components of the operator are connected with the entitlement server. The entitlement server authenticates the device, checks whether they are allowed to use the service, and facilitates the download of eSIMs to the secondary devices”.</p> <p>Page 69: “Apple, for example, requires operators supporting the Apple Watch to buy or develop such an entitlement server with certain specifications that acts as a gateway between the eUICC on the Apple Watch and the SM-DP+ server of the operator. Although a companion device is still needed for the communication between the entitlement server and the Apple Watch, the operator’s profile is delivered from the SM-DP+ to the Apple Watch.</p> <p>The need to invest in potentially different entitlement servers for different devices may serve to raise costs for MNOs and deter them from supporting a large range of different devices.”</p> <p>Also in Pages 133, 134,135, 136, 137, 138, and 142.</p>

2 Comments regarding use cases

Stakeholder comment	WIK response
<p>Vodafone agrees with the use cases and their groupings and notes as a particular use case of eSIM for M2M the ability to provide for global deployment, even in highly regulated markets.</p>	<p>The importance of eSIM for cross-border M2M provision is clearly highlighted in the study (see sections 4.3 and section 9.3.4 in the Annex).</p>

3 Comments regarding eSIM support in the Irish market

Stakeholder comment	WIK response
<p>Vodafone and Three disagree that eSIM support in Ireland is lagging, with Vodafone noting that the consumer use cases are developing and that eSIM support will be adopted “without question</p>	<p>In the study we note that the partial support for eSIM by MNOs in Ireland (see section 7.2) contrasts with more widespread support by MNOs in neighbouring countries (see section 6.2.1) and seems out-of-line with the otherwise advanced character of consumer hardware and cars available in the Irish market.</p>

4 Comments regarding forecasts for eSIM availability and take-up

Stakeholder comment	WIK response
<p>Three submits the forecasts to be reasonable, noting the early stage of deployment.</p>	<p>The diverging views concerning WIK’s forecasts for eSIM availability and take-up suggest that the central projection is likely to be realistic.</p>
<p>Mobilise submits that WIK forecasts for eSIM adoption in Ireland are conservative, given recent market developments indicating growing eSIM device penetration internationally.</p>	
<p>Virgin submits that the forecasts are likely to be optimistic, as they are likely to be impacted by a number of challenges identified by WIK, including a lack of eSIM support, consumer friendly OTA provisioning and low consumer awareness.</p>	

5 Comments regarding environmental impacts

Stakeholder comment	WIK response
<p>Vodafone notes the benefits of eSIM in reducing the use of plastic and carbon emissions.</p>	<p>The comments are consistent with WIK’s report, which notes (Section 5.3) that eSIM is likely to deliver environmental benefits, and that these will be greater than developments such as smaller SIM cards and EcoSIMs but that the benefits may take time to emerge and may be of limited scale in absolute terms.</p>
<p>Three consider that eSIM will bring environmental benefits, though it argues that much of those benefits identified by WIK are incidental</p>	

Stakeholder comment	WIK response
<p>Mobilise agree with the environmental benefits eSIM outlined by WIK. Mobilise notes that other solutions such as ECO SIM can bring some benefits, but that integrated or embedded SIMs (such as eSIM) bring the greatest reduction in emissions.</p>	<p>As new chips are increasingly installed in devices such as smartphones, tablets or smartwatches, as well as in larger consumer goods such as cars, there is a greater risk that consumers may experience malfunctions, including at the moment of delivery (“Dead on Arrival”). A malfunctioning eSIM chip could indeed render the device, smart meter, car, etc. useless and may call for extensive repair. However, this potential weakness needs to be weighed against environmental (and other benefits) that could be gained from using an eSIM instead of a plastic SIM-card. It should also be noted that there are no significant reports as yet that eSIM chips constitute a major source of device malfunctions.</p>
<p>Virgin Media considers that with the analysis demonstrates the environmental benefits of eSIM and OTA but states that the analysis of environmental benefits failed to consider Dead-on-Arrival</p>	

6 Comments regarding security

Stakeholder comment	WIK response
<p>Mobilise note a physical SIM requires in-store collection or delivery, which enables security checks either in-person or via confirmation of the customer’s address. Mobilise consider that such means of identity confirmation are not applicable to fully-digital OTA and that robust security checks are required in their absence to confirm device ownership, such as electronic Know-Your-Customer (eKYC).</p> <p>Mobilise note the wider importance of mobile security given its use as a backup confirmation by other industries such as banking. For example, if a user’s online mobile account is compromised, an eSIM could be issued and a number ported potentially providing access to a victims banking. Mobilise label this a new form of “SIM swap”. Mobilise seek further clarification and regulatory input in order to protect consumers trust in mobile security and banking.</p>	<p>We agree that proper ID verification is important in the context of fully digitised OTA provisioning and switching, and that the increasing use of mobile authentication to support authentication in other services reinforces the importance of ID verification.</p> <p>We have generally addressed security risks in Table 5-1 (see section 5.4) including risks relating to hacking, subscription fraud and SIM cloning.</p> <p>We have made reference elsewhere in this context to the importance of secure identification such as two factor authentication or eID and we make reference elsewhere to the potential use of eKYC (Footnote 197).</p> <p>We also note that the GSMA has established a Security Accreditation Scheme.</p>

7 Comments regarding the risk of lock-in

Stakeholder comment	WIK response
<p>Tesco asks ComReg to acknowledge and address lock-in concerns (including from OEMs), and investigate what remedies could be used to address these concerns under the EECC, competition law and upcoming DMA. Tesco notes that WIK describes lock-in concerns as significant and a key barrier, and seeks clarity on how these would be addressed.</p>	<p>SIM-locking has been a hotly debated issue even prior to the introduction of eSIM. The introduction of eSIM provides scope to switch provider in cases such as distributed IoT where switching may not have been previously possible for logistical reasons. At the same time the fact that eSIM could contribute to the proliferation of connected devices could increase the number of cases (besides primary consumer devices) where SIM locking could occur e.g. in relation to companion devices, IoT. The potential for OEMs to play a role in SIM-locking in eSIM-enabled devices is also explored in the report. As eSIM take-up is still at an early stage, it is not yet apparent to what extent eSIM-locking will be a problem in practice. However, we do note in the report some possible solutions to address lock-in challenges (see section 8.3.3). It is a matter for ComReg (and bodies at EU and/or international level) to consider whether and at which stage solutions of this kind should be pursued.</p>

8 Comments regarding proposed Actions to promote OTA provisioning and switching

Stakeholder comment	WIK response
<p>Action 1 – rationale and scope of a potential mandate for OTA provisioning and switching: Vodafone and Eir consider a mandate unnecessary as OTA will be driven by market developments. Vodafone and Three also submit that it is too early for ComReg to implement a mandate given the early stage of eSIM deployment in the market, while Eir questions the proportionality of a mandate and suggests that there is no evidence of market failure.</p>	<p>The WIK report highlights that Irish operators are behind operators in neighbouring countries as regards support for eSIM, and that this does not appear to be explained by reduced availability or demand for eSIM-enabled products in the Irish market (Sections 6 and 7). WIK highlights significant consumer benefits that could arise from OTA provisioning and switching (see Section 5.1). As regards recommendations (see Section 8.3.3.), WIK leaves it open as regards whether ComReg should mandate or set an objective for fully digital OTA provisioning and switching. WIK suggests that such a target or mandate should apply only to smartphones for the moment. WIK provides examples and recommendations regarding the means of OTA support (see Section 8.1.2), but notes that there is likely to be an evolution in the methods used and does not suggest that any specific solution should be mandated.</p>
<p>Action 1 – implementation period: Vodafone, Eir and Virgin states the proposed 12 month timeframe could result in sub-optimal OTA processes and therefore result in less desirable customer journeys. Vodafone, Eir and Virgin claim this timeline could raise the total cost of the investments and result in higher costs. Vodafone and Eir claim this</p>	<p>WIK notes (section 8.3.4) that ComReg <i>could</i> establish a target of 1 year from the relevant decision for MNOs to support eSIM and fully digital provisioning and switching processes for consumer devices. It does so noting that there are significant advantages for consumers linked to OTA provisioning and switching and that (as of May 2021 i.e. 1 year ago) all MNOs had launched eSIM support for smartphones in neighbouring countries including the UK, France, Germany and Spain. However, we also note (section 8.3.1) that OTA provisioning and switching should be made available in the shortest feasible timeframe, <i>while</i></p>

Stakeholder comment	WIK response
<p>timeframe would interrupt the planned investment cycle and could result in knock-on effects on other projects.</p> <p>Eir claim this timeframe effectively forces MNOs to adopt external solutions to support OTA. Eir consider there to be no reason for WIK to contradict the views of interviewees that such a process would take 18-24 months, which Virgin state aligns with its own experience in other markets.</p>	<p><i>providing sufficient time for MNOs to implement the relevant solutions.</i> In this context, we note that interviews with operators suggest that development or full integration of systems for eSIM management could take between 1.5-2 years, but that timeframes could be shortened by using solutions from eSIM management providers. It is for ComReg to determine what the relevant target period should be for implementation of eSIM support with OTA processes, taking into account implementation challenges (and the costs and benefits of using third party eSIM management solutions), alongside consumer benefits. A longer period, of around 18 months, could provide more scope for MNOs to implement in-house solutions.</p>
<p>Action 3 – MNP review: Twilio notes that the proposed MNP review is not solely OTA specific, while Virgin suggests that no MNP review is required</p>	<p>WIK notes that the MNP process in Ireland is efficient by international standards and is largely “OTA-ready” in that it is largely conducted without manual intervention (see Section 3.6.2). WIK also observes that the MNP process operates separately from (and consecutive to) switching between different profiles, and that this does not present a barrier to the vision for a fully digital customer journey. However, in view of the importance to consumers of MNP within the process of switching operators, it may be prudent to review the MNP process, particularly since the digitisation and acceleration of the process to switch service provider that is enabled by eSIM could serve to highlight any potential delays due to MNP that may previously have been obscured within a longer process overall.</p>
<p>Action 4 – M2M: Vodafone and Twilio submits that switching for M2M is too complex for a standardised approach. Furthermore, Vodafone states that country-specific rules can stifle innovation (e.g., local SIM requirements delaying eSIM deployment). Vodafone state that porting should not be extended to M2M, noting that the number is of no use to the end consumer and M2M use cases may use extra territorial numbers. Three supports action to ensure clear contractual terms, but not the mandating of eSIM for all use cases via contractual terms.</p> <p>Vodafone submits that contractual conditions are addressed under the Code and do not consider further regulatory intervention necessary.</p> <p>Twilio questions the benefit of an action on contractual terms. Twilio</p>	<p>WIK acknowledges that switching processes for M2M can be complex, and this is a key reason behind the proposal to differentiate recommendations for consumer and M2M OTA provisioning and switching. However, actions can still be taken. Specifically, WIK advocates action by the industry to support the adaptation of the consumer specification for M2M or simplification of the M2M specification to improve the switching potential for M2M (Section 8.3.3). Best practice guidelines could also be established regarding contractual terms, with a focus on the need for the contract to provide transparency regarding the switching process and associated costs and ensure the “best effort” collaboration of the donor operator in facilitating the switching process.</p>

Stakeholder comment	WIK response
<p>notes that the cost or duration of a M2M switch would be difficult to estimate in advance, depending on unknown factors such as the number of devices at the time of the switch or the portion of devices which may be switched. Twilio submits that any such estimate would entail uncertainty and therefore require caveating. Twilio notes that ComReg has not provided a draft of how this requirement would be drafted.</p>	
<p>Action 6 - MVNOs: Vodafone and Three agree with this action. Three state that MVNOs operate their own SIM provisioning and therefore a requirement for eSIM support to be extended to MVNOs is not required. SIM Local agree with this but expect ComReg to begin this monitoring soon, in time for the introduction of an eSIM only handset by a major device manufacturer.</p> <p>Virgin state it is unclear what Action 6 entails, and dispute whether this fits within the monitoring described by WIK and whether WIKs report indicates no MVNO requirement is necessary. Virgin considers that the proposed actions do not address the challenges faced by MVNOs in relation to the cost of eSIM adoption nor an MVNOs dependency on its host. Virgin notes that implementing eSIM support could impose costs on MVNOs and that an outline of the technical infrastructure and associated cost necessary to deliver a minimal “viable” eSIM solution would be useful</p> <p>Mobilise consider monitoring to be insufficient and regulation necessary to ensure no distortion to competition from delayed access for MVNOs to eSIM support. Mobilise note that any benefits from digital MVNOs will be delayed due to a lack of timely support.</p>	<p>WIK observes both risks and opportunities for MVNOs in connection with the introduction of eSIM and OTA provisioning (see section 5.2.2). Because costs of implementation could outweigh the benefits for MVNOs in the early implementation phase of eSIM, WIK suggests that MVNOs should not be included in any target deadline for eSIM support that may apply to MNOs. Nonetheless, we recognise that it will become essential for MVNOs to support eSIM at the stage where key consumer devices are launched without a physical SIM option. In cases where MVNOs compete for customers with their host, there might be incentives for MNOs to delay eSIM support for MVNOs. On the other hand, certain MVNOs operate their own SIM provisioning and there may be an incentive for MNOs to provide eSIM support for MVNOs which operate business models that could be complementary or additive to their own business. We consider that the risks and uncertainties warrant close monitoring by ComReg (see Section 8.3.3). However, as the market for mobile access and origination is considered to be effectively competitive, there is no remit for regulatory intervention at this time.</p>

Stakeholder comment	WIK response
Twilio consider there to be a contradiction between ComReg's expectation of greater competition between MNOs and MVNOs and ComReg's view that market forces alone should ensure the extension of eSIM support to MVNOs.	