

# **BEREC Report on the outcome of the public consultation on the draft Report on practices and challenges of the phasing out of 2G and 3G**



7 December 2023

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## Executive Summary

The Board of Regulators adopted the [draft BEREC Report on practices and challenges of the phasing out of 2G and 3G](#) (the “draft Report”) for public consultation at the 55<sup>th</sup> BEREC Plenary meeting (8 June 2023).

The draft Report sets out a high-level analysis of some of the main issues faced by different stakeholders or groups of stakeholders in 2G / 3G phase out, with a main focus on the potential impacts on end-users and an overall stakeholder analysis. The topic of 2G/3G phase out involves many stakeholders from many different domains; users (including vulnerable users and roamers), networks operators (including virtual operators), vendors, device and other manufacturers, competent national or European authorities, and standardization bodies. Sharing experiences, lessons learned, and common approaches will have positive effects on successfully phasing out 2G and 3G generations of mobile technologies in markets, while maximizing service continuity of high impact services that are currently still provided (partly) using 2G and 3G technology. Because the impacts on stakeholders are not always well communicated / understood due to the issue being at different stages in different markets, stakeholder engagement is a valuable tool for preparing for mobile technology phase out.

From 14 June until 15 August 2023, stakeholders were invited to comment on any of the material presented in the draft report, as well as they were asked to provide feedback on the following main consultation questions:

- Which other potential challenges/impacts would you identify?
- How urgently do you think the different challenges/impacts need to be addressed (time, priority)?
- What challenges/impacts have already been solved or can be considered minor?
- What stakeholders should initiate (more) efforts to meet the challenges/impacts?
- What stakeholders should be involved in efforts to meet the challenges/impacts? How should they contribute?

BEREC received 13 contributions (including one confidential contribution) from the following stakeholders (listed in the order in which they were received):

1. AOTEC – Telecommunications association from Spain
2. AIRE – Spanish telecommunications company, and wholesale operator
3. ETNO-GSMA (associations)
4. Confidential contribution
5. ECTA – Association of competitive operators
6. STS – Romanian Public authority (the administrator of the emergency communications systems in Romania)
7. ETSI – International Standards body



8. CRTV – Confindustria Radio Televisioni of Italy (association of commercial and public radio and television broadcasters)
9. Verisure – (provider of monitored security alarm systems – two submissions)
10. EENA – (European emergency number association)
11. KPN – (operator in the Netherlands)
12. BREKO (association of fiber network operators in Germany)
13. MVNO Europe (Association of virtual mobile network operators)

This report assesses and summarises the contributions.

### **Structure of this report**

The following sections set out some of the high-level comments, observations and recommendations received during the public consultation:

- **Chapter 1** sets out an overview of stakeholder comments & observations
- **Chapter 2** sets out stakeholders' views on the impacts / challenges arising from 2G 3G phaseout and BEREC's assessment and response to same.
- **Chapter 3** sets out a summary of the stakeholders' views on the consultation questions.
- **Chapter 4** sets out an overview of proposals from stakeholders about how the impacts and challenges of 2G 3G phase should be addressed
- **Chapter 5** sets out stakeholders' views that BEREC amend text in the final Report.



## 1. Overview of stakeholders' comments & observations

This chapter provides a short summary of stakeholders' general comments and relevant observations. The chapter concludes with BEREC's high-level assessment and response to same.

### *General comments*

In the main, respondents welcomed BEREC's draft report and some views can be summarised as follows:

- **ETNO and GSMA** set out that it [the draft Report] is balanced in describing the impacts on various stakeholders with the phasing out of 2G and 3G, a process that has already begun and will continue over the next few years. **ETNO and GSMA** also agree with the report's statement that the refarming of spectrum will contribute positively to efficiencies in spectrum and electricity usage as well as improved security in new generations of mobile networks.
- **ecta** warmly welcomes BEREC's initiative. **ecta** notes that the draft report primarily concerns 2G/3G shutdown and its consequences, by focusing primarily on the threats and opportunities of such phase-out, including the impacts on emergency communications and legacy systems. **ecta** believes that BEREC's draft Report, once finalized, could provide a useful contribution, in addition to the RSPG opinion on "Mobile Technology Evolution – Experiences And Strategies"<sup>1</sup> adopted on 15 February 2023, and to decisions that will be taken in relation with 2G/3G shutdown. **ecta** generally agrees with the overall picture provided in the draft report. **ecta** also considered that all listed examples of impacts in section 2 of the draft report as relevant.
- **KPN** (a member of both GSMA and ETNO) welcomes BEREC's work on the important topic of phasing out both 2G and 3G networks. It considers that the impact of the sunset of both these circuit-switched networks is considerable for a variety of users. Therefore, this phasing out must be planned studiously with considerable attention to all remaining user groups, informing them in a timely manner and offering them adequate (and usually superior) alternatives.
- **BREKO** supports many of the findings mentioned in the report.
- **MVNO Europe** expresses support for the contents of the draft BEREC Report, and considers that it:
  - Captures well what is at stake.
  - Provides a useful stakeholder analysis.
  - Recognizes Mobile Virtual Network Operators (MVNOs), and MVNO Europe specifically, as relevant stakeholders, and,

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<sup>1</sup>[https://radio-spectrum-policy-group.ec.europa.eu/system/files/2023-03/RSPG23-010final-RSPG\\_Report\\_on\\_Mobile\\_technology\\_evolution\\_%28with%20annexes%29.pdf](https://radio-spectrum-policy-group.ec.europa.eu/system/files/2023-03/RSPG23-010final-RSPG_Report_on_Mobile_technology_evolution_%28with%20annexes%29.pdf)



- Reflects input provided by MVNO Europe in response to BEREC's Work Programme 2023 consultation in Section 3.2.2.2.
- **EENA** commends BEREC on the draft report, which it considers is thorough in its analysis of the technical, economic, social and environmental issues associated with the phasing out of 2G and 3G technologies.

### *Relevant observations*

Respondents also set out to provide additional context on the status of 2G and 3G phaseout, and on the wider context in relation to some of the issues identified in the draft Report, as follows:

- **ETNO and GSMA** consider this [phaseout] technological transition as part of a process of continuous evolution of the sector. In particular, **ETNO and GSMA** do not consider a specific regulatory intervention in this process to be appropriate, since the operators are the main interested party in satisfying their customers' needs and ensuring that the transition is carried out as transparently as possible for them.
- **Verisure** notes that operators are responsible for granting service continuity to their end users, especially in those cases where continuity can affect provision of ulterior services such as utilities or private security.
- **ecta** underlines that the newer generations of mobile technology, such as 4G and 5G, provide significant advantages - increase spectrum and energy efficiency, ensure savings in network and maintenance complexity, improve communication security (better data encryption, authentication techniques), faster data speeds, reduce reserves of spare equipment and enable new use cases. These are all desirable benefits for operators and end-users. It is therefore a natural tendency for the M(V)NOs to go towards newer technologies as soon as possible. The evolution towards newer technologies by operators, on a voluntary basis and without imposition of deadlines, is therefore also positive from the point of view of regulatory authorities and administrations. In summary, **ecta** asserts that in general the 2G/3G phase out brings many efficiency gains for the operators and for users, and therefore, the 2G/3G phase-out should be a market driven process and should not be forced, imposed, or modified by institutions or regulators.
- In addition, **ecta** considers that the technology neutrality principle, and competition in all its forms, including infrastructure and service-based competition, are core enablers of innovation and investment in new technologies in telecoms markets, for the benefit of European society. In particular, it sets out that the RSPG identifies "Recommended MNOs' best practices" [in its report], and that these can be a very useful tool for dealing with the forthcoming 2G/3G switch-off cases. For example, **etca** claims RSPG identifies the following MNO best practices:
  - Transitional period



- Coverage matching what was previously offered
  - Reasonable formal notice period
  - A well-designed campaign involving direct targeting of affected customers, possibly assisted by the regulator
  - Upgrade incentives for customers.
- In relation to the above point, **ecta** requests BEREC to put greater emphasis on the full list of these best practices.

**ecta** also set out some comparisons between the draft Report and the recent RSPG report on mobile technology evolution as follows:

- **ecta** is happy to note that, similarly to RSPG, BEREC also reports “*the positive impact from technology neutrality and infrastructure competition towards evolution to newer radio technologies*” in its draft Report. **ecta** respectfully asks BEREC to include an equivalent statement as the one from RSPG “*it is up to mobile operators to decide on their best strategy according to the national situation/market*” in the final report.
- **ecta** kindly invites BEREC to put a greater emphasis in the final text, to the RSPG opinion which states, in relation to the expected lifespan of 2G/3G, that there is no need, from a spectrum regulatory perspective, for regulatory intervention to extend the lifespan of 2G/3G and to specify that BEREC agrees with this position.

## 1.1. BEREC’s assessment and response

BEREC would like to thank all respondents that offered their valuable insights on BEREC’s report about the 2G/3G phase out process. BEREC welcomes the opinion of the stakeholders that the report is thorough and captures well the different dimensions of the issue. BEREC agrees with stakeholders who support operators’ freedom to select the implemented network technology, aiming at efficiency and evolution. BEREC also agrees with the opinion expressed that it is the operators’ obligation to ensure service continuity and end user protection. However, BEREC considers that based on the consultation responses alone, there is insufficient evidence to completely rule out regulatory or policy interventions aimed at protecting consumers from the impacts of 2G / 3G phaseout. As a result, further analysis may be required on impacts to end-users, before coming to a final conclusion. BEREC believes that such additional analysis would be best made after there is more practical experience of 2G / 3G phaseout available. Even so, BEREC believes that it would be necessary to carefully distinguish between the possible types of interventions, and whether they could be regulatory or policy interventions as the responsibilities would reside with different stakeholders.

Regarding **ecta**’s claim that RSPG in its report identifies specific MNO best practices and its request to include these in BEREC’s report, BEREC would like to respond that these practices have not been identified and recommended by RSPG as optimum practices adopted in the



Member States.<sup>2</sup> These practices are included in chapter 3 “Some key points from stakeholder workshop” of the RSPG report where the main points introduced by participants in the workshop are presented. On the other hand, BEREC listed (at paragraph 1.2.7 of the draft Report) a summary of key practices implemented in different Member States, some of which have also been identified through responses to this consultation (please see section 4.1 of this report).

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<sup>2</sup> [RSPG23-010final-RSPG\\_Report\\_on\\_Mobile\\_technology\\_evolution\\_\(with\\_annexes\).pdf \(europa.eu\)](#)





## 2. Stakeholders' views on impacts identified by BEREC (as set out at pages 14-18 of the draft Report)

This chapter provides a high-level summary of stakeholders' views on the impacts identified by BEREC in the draft Report.

*Impact: Service availability/coverage*

**ETNO and GSMA** considers that many European MNOs have already started the transition from circuit switched to packet switched networks, and spectrum is being re-farmed for the roll-out of 5G networks and services to the benefit of consumers, businesses and society as a whole. In many countries' spectrum allocations have been fully technology neutral. They claim that altering the rules for how spectrum can be used, to oblige continuation of 2G or 3G technology retroactively, may be illegal.

**STS** claims that for access to services, including access to 112, at least the same coverage should be ensured by the 4G/5G networks. NRAs should pay special attention to this aspect.

According to **Verisure** for certain use cases M2M providers are still dependent in many geographies on 2G/3G technologies. For example, many voice calls still require 2G/3G technologies, as carriers in several geographies still do not support VoLTE for M2M use cases.

*Impact: Meter replacement before end of life*

**ETNO and GSMA** claims that, "end of life" should be based on availability of security updates or economic depreciation, whichever is shorter. In addition, they underline that "Continuity of services" must not mean indefinite support of legacy devices, as smart meters often are observed to operate on completely outdated software. *Therefore, disadvantages of legacy support for outdated devices should be taken into consideration when assessing the phasing out of services as well.*

**ECTA and BREKO** note that the 2G/3G shutdown would cause a total replacement of utilities (relying on 2G/3G technologies) e.g. M2M communication and, especially, smart electricity meters and other meters, which would imply not insignificant costs and likely difficult to justify.

Approximately 80% of all smart meters use 2G to communicate and would need to be fully replaced if 2G networks would be shut down. As these meters have a longer service life replacing them too early would lead to an increase in costs for the municipal service operators.

*Impact: Some older equipment may stop working unexpectedly*

**ETNO and GSMA** members consider generally that providers of IoT and M2M solution have been duly informed and notified about the closure plans of circuit switched networks in order to allow them sufficient time to consider their use and dependencies on circuit switched networks, and to ensure that their solutions and offerings can be duly upgraded.



**Verisure** is concerned about the level of awareness of IoT and M2M providers and points to the Annex I of the draft report which shows that in 15 out of 25 countries, operators have not yet started their transition or announced their plans to switch-off the 2G technologies. It claims that this fact is quite relevant and indicates the current lack of visibility about the actual operator's plans to migrate technologies. It considers that this is of utmost importance, to ensure service continuity to end users.

**Verisure** notes that even where VoLTE support exists, carriers cannot support VoLTE with roaming SIM cards, which is a particular challenge for M2M users, as many M2M devices that are installed across multiple geographies rely on "global" SIM cards that by design are meant to operate almost entirely via roaming.

Telecare alarms are effectively devices for seeking emergency assistance and need to continue to work or be replaced. **EENA** notes that 2G and 3G switch-off should not result in service unavailability for telecare alarms devices and this issue need to be urgently resolved.

*Impact: Vulnerable users cannot make phone calls or SMS*

**ETNO and GSMA** consider that operators providing transparent information to the customers and cooperating with NRAs and other stakeholders are sufficient to ensure the smooth shut down of older technologies. **ETNO and GSMA** conclude that in the case of Germany, 3G switch-off (cited in the BEREC report) demonstrates that legacy network switch-off can be achieved without negative consequences for customers.

**ECTA** agrees with BEREC when it considers that: "*every effort should be made by operators to minimize stress and worry for vulnerable users*". It believes that with the wider adoption of smart phones (GSMA predicts that, by 2025, smartphones will account for nearly 85% of mobile connections in Europe) even though will not solve those issues, will surely minimize them.

**KPN** emphasizes another constraint that needs to be lifted which stems from the e-Privacy directive. The Dutch telecommunication law restricts the ability of mobile operators to contact their customers in a targeted way. **KPN** knows from CDRs (call detail records) exactly which customers still use the 2G network. Despite **KPN's** best generic communication efforts, these customers may not be aware at all that their handset is unable to interoperate with the 4G and 5G networks and will find themselves 'suddenly' disconnected when 2G is switched-off. It would be helpful if these users (mostly the elderly) could be reached with targeted campaigns, pointing them directly towards suitable devices that can be purchased to continue using of the service.

*Impact: eCall in existing cars fitted with 2G modules stops working*

**STS** notes that despite advancements in the standardization of Next Generation eCall being made, IVSs (In-Vehicle System) for Next Generation eCall are still made just for test or pilot activities

**ETNO and GSMA** understand that the likely intention is for the European Commission to amend the Regulation 2015/758, which references the standards on which the technical



requirement for the approval of eCall systems in relevant categories of vehicles are based. The process is, however, already much delayed by the Commission even though lengthy exchanges between stakeholders have been conducted. It is extremely important that the Commission act rapidly on this matter to stop as soon as possible the legacy fleet (relying only on 2G/3G technologies for eCall) from increasing further, by allowing OEMs to support NG eCall in vehicles. In contrast, the regulatory requirement on mobile network operators (MNOs) to support eCall is technology neutral and operators are at liberty to progress towards NG eCall, which was confirmed by the RSPG in the “RSPG report on Mobile technology evolution – experiences and strategies”, which concluded that “no need has been identified for regulatory intervention to extend the lifespan of 2G/3G”.

**ecta** fully agrees with the RSPG’s position on e-Call, when RSPG states that “*in the future, a technology neutral approach is preferable to avoid the same debate for future technology migrations*” and kindly invites BEREC to confirm this in the final text.

**ecta** claims it agrees with what BEREC reports:

- “*it is urgent that the European Commission amend the EU Type Approval Regulation*”. In addition,
- “*in the transition period it is up to the automotive industry to quickly integrate 4G modules and find adaptive solutions for the existing fleet*”.

*Impact: Voice calls not always possible (a service continuity issue)*

**ETNO and GSMA** consider that the challenges related to VoLTE and VoLTE roaming are well described in the draft report. To solve these challenges, an industry-wide Task Force was established within GSMA in order to address all relevant issues.

**EENA** noted with interest the reference in the draft BEREC report to GSMA’s efforts to reduce the number of VoLTE profiles to ease the testing logjam on OEMs and MNOs<sup>3</sup>. Based on vendor feedback, GSMA proposes that the recommended six VoLTE profiles can be further narrowed down to just two, namely Profile #4 (supporting VoLTE and SMSoIP) and Profile #6 (supporting VoLTE, VoWiFi and SMSoIP). GSMA considers that this will promote commonality, facilitate interoperability and reduce the overall testing burden in the industry. **EENA** and the wider emergency services community expects that, after 2G/3G phase out, VoLTE, VoWiFi and SMSoIP will all be used to access emergency services (and convey caller location information) in a seamless way.

**KPN** recognizes the interoperability issues that the Berec report describes, and [it] is actively working on this issue both internally and with the GSMA. It is also concerned about the interoperability of its network with mobile devices that **KPN** does not sell and has not tested on its network.

*Impact: Emergency communication not always possible*

**ETNO and GSMA** note that their members are dedicated to fulfilling their social responsibility to support emergency communication services. Mobile operators are developing an all-IP

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<sup>3</sup> <https://www.gsma.com/services/blog/two-ims-profile-chosen-volte/>



based infrastructure to support next generation emergency services, yet the interconnection with emergency services operators is, in many cases, still based on circuit switched communication networks. For example, Public Safety Answering Points (PSAPs) in the EU should have the capability to receive and handle the most modern means of communications including IP-based 4G and 5G technologies. In this regard, ETNO and GSMA also understands from the European Emergency Numbering Association that for the Next Generation 112 (NG112), coordinated action is urgently needed to ensure standardised NG112 in Europe<sup>4</sup>. The risk is otherwise, that fragmented solutions are implemented across the EU27, which will impact all stakeholders and cause delays. It is acknowledged that the transformation speed towards IP based emergency solutions across EU differs. Therefore, 2G and 3G sunset plans may take place in some Member States as soon as 2025, while MNO's are still fulfilling all their legal requirements.

**ecta** considers that it is crucial to make sure that emergency communications are ensured before, during and after the process of shutdown. It takes positive note of the ongoing standardization work to create a limited set of VoLTE implementation profiles. This work would make it easier for device manufacturers to ensure that their devices will support VoLTE. However, it deems this not a sufficient condition to ensure that all devices supporting 4G are able to make emergency calls. These standardization efforts, while providing an improvement to the issue, cannot be considered sufficient to eliminate the risk of having 4G-capable devices without the correct configuration to call emergency numbers.

**ECTA** agrees with the RSPG when it states: *“given the public interest involved with the availability of emergency services, it may in the end be necessary to mandate relevant stakeholders to ensure that devices that enter the EU market and support 4G (or future generations) are able to call the emergency number, regardless of the network it is operating on”*. RSPG identifies the Radio Equipment Directive (RED) (2014/53/EU) as the most appropriate legal instrument.

**STS** notes that emergency calls over LTE or 5G are not [always] permitted by the national carriers. There are developments that still need to be made by both MNOs and the PSAP to ensure continuous access to the emergency system for voice calls and associated information, like the location information (e.g.: Cell-ID, E-CID, AML). This impact is being addressed at the moment by carrying out tests with some of the MNOs that are reconfiguring their networks and adapting the 112 system to process emergency calls from 4G networks.

*Impact: SMS authentication not always possible*

In addition to the need for authentication, **STS** notes that SMS services are also used to access emergency services for people with disabilities and by PSAPs to locate the caller. In Romania, the access to the emergency service for persons with disabilities is based on the SMS service. This service is ensured by default on all user devices and on all mobile networks using CS (circuit switched) technology because SMSoLTE and SMSoWiFi are not implemented by all the MNOs present in Romania and phasing out 2G/3G will limit the

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<sup>4</sup> <https://eena.org/our-work/eena-special-focus/next-generation-112/>



possibility of access to emergency services for people with health impairments. The PSAP also relies on SMS services to locate the caller using Advanced Mobile Location – AML (the mobile terminal sends AML location by using SMS) and sometimes using the Geolocation solution (which sends an SMS containing a link to the caller that conveys the device's location information to the emergency system). These features will be affected by shutting down 2G/3G networks.

Similar to STS, **EENA** also notes that the impact on SMS arising from 2G/3G phase is not limited to two-factor authentication only. **EENA** is aware that SMS-to-112 is a mainstream channel of access to emergency services in 23 European countries. In addition, the transmission of handset-derived location from smartphones (i.e. Advanced Mobile Location), relies heavily on SMS as does location provided using HTML5 (the link required to transmit device-based location to the PSAP using HTML5 is sent to the end- user in a SMS message). There is a strong expectation that SMS will continue to function correctly following 2G/3G phaseout. While **EENA** expects location information to be provided using the SIP protocol in the future (VoLTE, VoWifi, and SMSoIP are all based on SIP), the transition to an end-to-end SIP environment will not happen overnight. The pace of deployment will vary between Member States, ECN/ECS providers, enterprise networks and PSAPs. Consequently, the existing solutions for the provision of handset-derived location will need to remain in place for the foreseeable future.

*Impact: Competition issues for small MNOs and MVNOs.*

**AOTEC** and **Aire Networks** call attention to the issues and difficulties the MVNOs, or small MNOs may experience in putting forward preferred VoLTE, VoNR profile alignments in standards, and implementing them, as compared to bigger MNOs. **AOTEC** and **Aire Networks** agree that terminal equipment manufacturers have an important role in supporting VoLTE. Mobile devices must meet certain technical requirements in order to use the VoLTE service. These requirements include support for the communication protocol used (IMS), as well as for the radio frequencies used by the network. However, even when these circumstances occur in the equipment, the same VoLTE-compatible device may only work with some mobile communication operators and not with others, due to the specific network configuration required for each operator. Device manufacturers must ensure that they meet each carrier's requirements for their devices to work on their respective networks. Manufacturers with a significant market share (such as Apple or Samsung) negotiate these configurations with the operators. The manufacturers do it in exchange for the operators to advertise and sell a significant number of their terminals. In practice, this circumstance means that only large operators, specifically network operators, can access these benefits from equipment manufacturers. This circumstance is putting MVNOs against the ropes, regardless of their host operator.

**AOTEC** and **Aire Networks** believe that there are only two solutions to this problem:

- either the large mobile phone manufacturers are forced to guarantee the configuration of the MVNOs' phones,
- either host operators are required to include their own MVNOs in negotiations with equipment manufacturers when it comes to guaranteeing the correct operation of



VoLTE devices in all cases. (**AOTEC** and **Aire Networks** believe that this is the most effective solution)

**ecta** notes that today, in several EU Member States, there are structural problems related to an unbalanced spectrum portfolio between the large (early entrant) MNOs and the smaller MNOs who are generally late entrants. The challenger MNOs who are generally late comers hold much less spectrum than their competitor incumbents, especially in the low bands and more generally also in all bands below 4 GHz, and this creates significant competitive problems. **ecta** considers that the competition issues for small MNOs which create problems, inter alia, during and after the 2G&3G phase-out, should necessarily and urgently be solved through policies which should ensure a more equal and fair spectrum allocation between the smaller operators and the bigger/incumbent operators. If the measures mentioned by BEREC in the draft Report (*having similar coverage levels of 4G prior to 2G/3G switch-off and recognizing that frequencies used for 2G/3G can be used for other technologies*) will be complemented by those structural policies, then there would not be a service availability/coverage issue. If this issue will not be solved in a structural manner at the first available spectrum renewal process, it will create real problems not only for 2G/3G phase out but also will create even bigger competitive flaws and will obstacle the effective take up of 5G and introduction of 6G technologies in selected EU markets.

**MVNO Europe** particularly welcomes the part of Section 2.1 of the draft BEREC Report entitled: 'Competition issues for small MNOs and MVNOs'. It is important that the text in this section is maintained in the final BEREC Report. MVNO Europe therefore urges BEREC to resist any potential requests from other stakeholders to amend or delete it.

**MVNO Europe** notes that some (Full) MVNOs encounter difficulties in obtaining adequate support from the mobile communications ecosystem (particularly, but not limited to, the case of MVNOs using their own IMSIs) with regard to the provision of Voice over LTE (VoLTE) and Voice over New Radio (VoNR). The same inadequacies and difficulties with regard to support for VoLTE/VoNR occur in some cases in roaming scenarios. The situation regarding VoLTE/VoNR compatibility of mobile handsets is in some cases deeply problematic (devices without the required compatibility, devices with VoLTE not switched on by default, manual settings buried deep in complicated menus, and SOC vendors (System on a Chip), like ARM, Huawei, Qualcomm, Samsung and MediaTek blocking such services in the baseband software for unknown IMSIs).

The concern from the perspective of **MVNO Europe** is that some (Full) MVNOs are being discriminated based on the (limited) size of mobile service provider and/or the commercial relationship between the smartphone manufacturer and the mobile service provider. It is well known that the mobile operators which have concluded a so-called 'carrier partner agreement' with Apple (which typically involves commercializing iOS devices) receive a 'carrier bundle' (some share this with the (light) MVNOs they host), whereas other mobile service providers are relegated to using the 'unknown carrier bundle', which results in certain iOS features and hardware/software capabilities not being enabled. In practice, the situation is such that even 4G and 5G-capable handsets may not work properly in some cases where a (Full) MVNO is the mobile service provider. This is especially the case for Full MVNOs that operate under their own Mobile Network Code and IMSI range and operating their own IMS VoLTE core. MVNO Europe emphasizes that the problem is not only occurring with older handsets (so the solution is not simply "buy a new handset" or "governments could take measures to encourage



swapping old handsets for new ones”) but also with very recent and 5G capable devices that lack the proper carrier bundle/configuration for the applicable (Full) MVNO, or where the ‘unknown carrier bundle’ does not enable VoLTE by default.

## 2.1. BEREC’s assessment and response

BEREC has considered stakeholders’ views on the impacts identified at the public consultation. In the main, stakeholders agreed with BEREC’s analysis. Next below, BEREC sets out its assessment and response to some of the points raised.

Firstly, BEREC notes that regarding the service accessibility and coverage, many European MNOs have already started the transition from circuit switched to packet switched networks, and the associated spectrum refarming to facilitate the roll-out of 5G networks and services, and that this is done on the basis of technology neutrality. BEREC is, however, mindful that the key issue is not when either 2G or 3G is phased out but when both technologies are phased out, as no fallback options remain at all. BEREC considers therefore, that many impacts might be latent impacts, and that some of impacts might only be realized in the future when both 2G and 3G technologies are unavailable.

Secondly, BEREC takes into consideration the need to ensure the same level of access to services, including access to 112, by having at least the same coverage for the 4G/5G networks as older generations. BEREC also understands that in several geographies not all carriers support VoLTE for M2M use cases, so the issue may be different on a case-by-case basis.

BEREC also notes in some cases, the potential need for a total replacement of devices in the utilities sector, where relying on 2G/3G technologies (e.g. telecare alarms devices, utilities M2M communications and, especially, smart electricity meters and other meters) and that this may result in significant replacement / switching costs. BEREC also believes that 2G / 3G phase out should not result in service unavailability for these utilities and attention is needed by the connectivity providers / operators to best address their customer needs, particularly in line with any contractual obligations they may have entered into. BEREC will add the remark of Verisure about ‘global’ SIM cards in a footnote in the report.

Thirdly, BEREC supports efforts to minimize the stress and the worries for vulnerable users. Wider adoption of smart phones may enhance the user experience for some vulnerable users, but there may be gaps, as not all vulnerable users can easily adapt to new technologies / device features. In most Member States, there are specific training supports for vulnerable groups, typically run at local level rather than at national level, helping users adapt to digital services. Those outreach supports could become irrelevant in case that the actual quality of service (e.g. not being able to make emergency calls) is degraded. As a result, BEREC agrees



with stakeholders that this is a main issue which is unresolved as yet, and it is therefore appropriate that the issue maintains prominent in the Final BEREC report.

*Other points: eCall, service continuity; SMS authentication and competition issues*

BEREC observes that the issue of eCall received widespread attention<sup>5</sup>, however, there were no new points to be added under the impacts section in the draft Report. For example, BEREC was invited to confirm that it too agrees the RSPG's position on e-Call, "*in the future, a technology neutral approach is preferable to avoid the same debate for future technology migrations*". BEREC's position in support of service and technology neutral licensing is well documented elsewhere and we do not see any need to amend the draft Report to address this point.

The service continuity issue is expressed by MNOs which mention that after 2G/3G phase out, VoLTE, VoWiFi and SMSoIP will all be used to access emergency services. BEREC notes also the industry-wide Task Force, established within GSMA in order to reach consensus and implement practical solutions to ensure service continuity and BEREC mentions this in the final Report.

In relation to the impact to SMS authentication, BEREC agrees with stakeholders that, not only is there an impact to two-factor SMS authentication but also to SMS services used by PSAPs to locate callers in emergencies. BEREC will therefore update the relevant description of this impact in the final report accordingly, as there is potential for serious impacts if location cannot be given by new technologies. BEREC considers that failures in providing location information as a result of phaseout would provide a strong argument for policy makers to call for older technologies to be retained, or for phaseouts to be postponed out until such a time as emergency caller location impacts are overcome. BEREC also agrees with stakeholders about emphasizing adequate testing of solutions in this regard.

In relation to stakeholder views on potential competition impacts, BEREC would observe that Article 101 (1) TFEU sets out that agreements that restrict competition are prohibited. BEREC does not propose to conduct a competition analysis about above stakeholders' claims in this report on 2G / 3G phaseout. Stakeholders may wish to explore options with relevant competition authorities, in line with competition law, in relation to their views on potential anti-

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<sup>5</sup> BEREC is aware that the EC is advancing its thinking about two aspects on the eCall issue, with recent publications on: (1) adapt the specifications of emergency call centres receiving and handling eCalls to 4G/5G telecommunications networks ([https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/13191-Automatic-emergency-112-eCall-by-onboard-vehicle-systems-EU-wide-interoperability-specifications\\_en](https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/13191-Automatic-emergency-112-eCall-by-onboard-vehicle-systems-EU-wide-interoperability-specifications_en)) and (2) update standards for the transition of eCall to 4G and 5G networks ([https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/13845-Vehicle-safety-updated-standards-for-in-vehicle-emergency-call-systems-eCall\\_en](https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/13845-Vehicle-safety-updated-standards-for-in-vehicle-emergency-call-systems-eCall_en))





competitive or restrictive effects regarding the enablement of VoLTE / Vo NR features, including for roaming customers. It seems to BEREC that some of the MVNO issues raised, could have serious impacts on certain classes of consumers, which if left unaddressed could require interventions, though it is too early to consider what they might be, or whether they could be regulatory or policy interventions.<sup>6</sup>

Furthermore, BEREC does not agree with the claim that in some markets there are *structural problems related to an unbalanced spectrum portfolio between the large (early entrant) MNOs and the smaller MNOs who are generally late entrants*. Asymmetry in spectrum holdings is the result of competition in markets, and regulators must have regard to their functions, objectives, and duties, as set out in national laws, to mitigate against distortions to competition.<sup>7</sup>

#### *Stakeholder inaccuracies when quoting from RSPG*

BEREC observes that respondents have referred to text set out in RSPG's report, but in isolated cases, text has been selectively quoted, and the context is not correct as a result. For the avoidance of doubt, in the draft Report, BEREC set out that stakeholders at the RSPG workshop had views that, "*it is urgent that the European Commission amend the EU Type Approval Regulation*" and not RSPG [emphasis added]. In addition, it was stakeholders who considered it necessary to stop, as soon as possible further deployment as it creates a legacy fleet of cars with eCall, and that these efforts/measures would ease the smooth shut down of the in Vehicle Systems relying on eCall.

Similarly, RSPG set out that (see page 16 of the RSPG report) "*From a spectrum regulatory perspective, no need has been identified for regulatory intervention to extend the lifespan of 2G/3G...*" [emphasis added]. BEREC agrees with the RSPG's spectrum regulatory perspective, but BEREC is also of the view that protecting quality of service, such as protecting access to emergency services, must be provided for. If there is an impact to access to emergency services, and if the market cannot deliver solutions, measures / interventions may be required to be taken. Presently, the consultation does not conclude on this matter, and BEREC notes the point from the stakeholder that it agrees with the RSPG view: "*given the public interest involved with the availability of emergency services, it may in the end be necessary to mandate relevant stakeholders to ensure that devices that enter the EU market and support 4G (or future generations) are able to call the emergency number, regardless of the network it is operating on*" [emphasis added].

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<sup>6</sup> In addition, BEREC is aware of similar competition points being raised by stakeholders as set out in the Study on mobile connectivity, trends and issues for emerging mobile technologies and deployments see here [BEREC \(europa.eu\)](https://www.berec.europa.eu)

<sup>7</sup> BEREC considers that spectrum portfolios of different sizes have given rise to benefits for consumers in terms of price and choice, and better innovations in markets.



In summary, BEREC has considered stakeholders' views on the impacts set out in the draft report and finds that save for a few additions as set out above, the main impacts have been described reasonably accurately by it.



### 3. Stakeholders' feedback in response to the consultation questions

In addition to inviting comments on any of the issues set out in the draft report, BEREC also asked stakeholders to provide feedback on the following questions:

- *Which other potential challenges/impacts would you identify?*
- *How urgently do you think the different challenges/impacts need to be addressed (time, priority)?*
- *What challenges/impacts have already been solved or can be considered minor?*
- *What stakeholders should initiate (more) efforts to meet the challenges/impacts?*
- *What stakeholders should be involved in efforts to meet the challenges/impacts? How should they contribute?*

Many stakeholders set out that the entirety of their submissions should be considered as answers to the questions, so they did not comment on individual questions *per se*.

BEREC would invite readers therefore, to consider all of the submissions received alongside reviewing this chapter. Nevertheless, views can be identified and these are summarized under the particular question headings below.

*Question: Which other potential challenges/impacts would you identify?*

According to **STS**, another aspect is that security should be taken into consideration as 5G is gaining more traction. It considers that security vulnerabilities can be exploited by having easy access to high speed, low latency mobile connections, and given that the 5G environment unlocks new capabilities, and new services, [creating] a wider attack surface. To provide a unified minimum layer of security for both 4G and 5G communication, it considers that NRAs should enforce a set of requirements that will be implemented at the MNO level that will minimize the risks for all involved, vulnerable parties.

From **MVNO Europe's** perspective, it is key for BEREC, and all stakeholders involved, not to focus only on supporting emergency calling, mobile international roaming, and proper functioning of M2M/IoT, but also on competitive distortions which arise from the phasing out of 2G and 3G. Issues with emergency calling are only a symptom of a broader problem with VoLTE/VoNR/VoWiFi being withheld on some devices from some mobile service providers (in particular (Full) MVNOs), in some cases for outright commercial reasons.

*Question: How urgently do you think the different challenges/impacts need to be addressed (time, priority)?*

**MVNO Europe** notes that ensuring VoLTE support by default, standard out of the box for all devices, and an update (OS/firmware) pushed by the OEM or OS provider to all existing VoLTE capable devices, without any user interaction, is critical and should be addressed as the highest priority.

**ecta** considers that the main challenges to be solved should be ranked according to the following priority list (1 - having the higher priority):



1. competition issues for small MNOs/MVNOs and problems regarding emergency communication and voice calls which cannot always be made in a scenario of 2G and 3G phase- out.
2. Meter replacement before end of life, some older equipment may stop working unexpectedly, Vulnerable users cannot make phone calls or SMS, eCall in existing cars fitted with 2G modules stops working

**SES** considers that VoLTE interoperability problems (including for roamers) involving chipset producers, mobile network operators and device manufacturers should be prioritized, to ensure seamless access to the emergency systems across Europe for all citizens. All stakeholders should actively get involved in testing all compatibility aspects.

**EENA** focuses its attention to the challenges and issues that are important and urgent to be addressed for the need of continuation of access to emergency services. EENA's views in more details are presented in Section 1 of this summary report (titled addressing the impact on coverage, equipment, eCall, emergency communication and SMS), but in summary the following challenges/issues can impact the access to emergency services and need urgent actions:

- High level of geographical coverage is crucial for emergency communications;
- Technical solutions for VoLTE compatibility/interoperability must be implemented before 2G/3G is completely phased out;
- The need for changes in the regulatory framework for eCall is urgent;
- There is a need to deploy an alternative solution for the SMS based access to emergency services (including the provision of handset-derived location via SMS), so the SMS will continue to function correctly following 2G/3G phase out. EENA expects location information to be provided using the SIP protocol in the future;
- Telecare alarms are devices for seeking emergency assistance and need to continue to work or be replaced.

**KPN** draws attention to the urgent need of a policy change to actively stimulate car manufacturers to start equipping cars with future proof "Next Generation" eCall devices. Parallel to stopping this problem from growing, a solution is needed for the millions of cars that drive throughout Europe with these soon-to-be outdated eCall devices.

**ETNO and GSMA** consider the main challenge which needs urgent action is the need to ensure that Car Original Equipment Manufacturers (OEM)s have the regulatory requirement in place for the support of Next Generation eCall (NG eCall) in vehicles. OEM's current requirement to support eCall is not technology neutral, and to progress towards NG eCall, OEMs need regulatory certainty.

*Question: What challenges/impacts have already been solved or can be considered minor?*

From an emergency communications/emergency services perspective, **EENA** strongly believes that that none of the challenges/impacts identified have been adequately solved yet nor are any of these challenges/impacts considered minor.



No other stakeholder explicitly expressed a view on this question, but it can be assumed from their responses that they do not consider any challenges/impacts to be trivial.

*Question: What stakeholders should initiate (more) efforts to meet the challenges/impacts?*

One stakeholder considers that EU Commission should adopt the ban of sale of terminal equipment without the VoLTE and /or VoNR feature (End-Of-Sale for 2G chipset) and End-of-Service date for 2G as soon as possible to let start the clock of 2G phase out. Incentives for the replacement of metering equipment that has already overtaken the 80% of their lifetime could make the replacement of 2G meters quicker.

**EENA** notes that following stakeholders should initiate (more) efforts to meet the challenges/impacts:

- The European Commission should set out its plans for the transition to Next Generation eCall as soon as possible so that certainty can be provided to concerned stakeholders on the timeline for implementation, the duration of legacy support and/or plans for retrofitting of vehicles with legacy eCall in-vehicle systems.
- MNOs need to engage closely with their customers and national regulatory authorities on their respective 2G and 3G phase out plans. These plans should include cost-effective solutions aimed at encouraging end-users to upgrade end-user devices that rely on legacy technologies. **EENA** underlines that continuity of access to emergency services should be a central theme in any such plans.
- MNOs should also support MVNOs relying on their respective networks in the transition to VoLTE and VoNR. There may be a need for National Regulatory Authorities to coordinate on this matter at the national level to ensure that there are no adverse effects experienced by any MVNOs with regard to continuity of access to emergency services.
- Network equipment providers, handset manufacturers and handset operating system providers need to continue to work together closely, and in conjunction with 3GPP, ETSI and GSMA, to resolve network-handset compatibility, interoperability and configuration issues in a 4G/5G environment.

**MVNO Europe** notes that following stakeholders should initiate (more) efforts to meet the challenges/impacts:

- It seems inexplicable that proposed revisions to the eCall Regulation and a RED Directive Implementation Act (based on Art. 3.3 (b) and (g) of the Radio Equipment Directive) have not formally been put forward by the European Commission so far.
  - i) RED directive 2014/53/EU: It is imperative that a European Commission Delegated Act, in application of Art 3.3(b) and 3.3(g), mandates that all new devices support and enable VoLTE 'out of the box' for all IMSIs of all M(V)NOs on a formally standardised basis (avoiding the current wide variations in the way VoLTE is implemented). This should be done in a way to ensure formal standardisation of all forms of usage of VoLTE (and VoNR) (not solely for emergency communications).
  - ii) Regulation 2018/858: It is urgent for this Regulation to be updated, to cover packet-switched eCall on a formally standardised basis (avoiding variations, and ensuring



a long- term approach to avoid problems occurring again when future generations of mobile technology replace the anterior generations).

- 3GPP/ETSI should do more to ensure that all devices are able to use VoLTE by default as a bare minimum. The GSMA's NSX should be made mandatory through the standardisation bodies.

**ETSI** sets out that since 2015, the standards have matured further and are now fully stable, enabling manufacturers to open up the functionality even to networks that have not been unilaterally tested. In addition, [**ETSI** claims that] whilst it is true that discussions in 3GPP sometimes lead to optionality, 3GPP is the organization to provide solutions to different requirements, and it is up to the user organizations to select which of the requirements to be the minimum global requirement [emphasis added].

According to **KPN**, more effort is also needed from the European Commission on drafting the correct regulation so that the automotive sector is incentivized to take immediate action on soon-to-be outdated eCall devices. Mobile network operators throughout Europe (and the world) will continue to switch off circuit switched networks, rendering the current eCall solution useless.

*Question: What stakeholders should be involved in efforts to meet the challenges/impacts? How should they contribute?*

**Verisure** considers that the regulators have a key role to play in helping to ensure that the sectors that rely on 2G/3G connectivity for their services, including the health, energy and transport sectors, are aware of the change and can prepare accordingly.

**ecta** underlines that the issue of VoLTE interoperability depends substantially on the device manufacturers, mobile operating systems, and chipset vendors, which should comply with the 3GPP standards. Ensuring the interoperability of devices with VoLTE for emergency communications is a technical task that only device producers can undertake.

In **EENA's** view BEREC correctly does not assign the responsibility of addressing the challenges/impacts of 2G and 3G phase out on any individual stakeholder or stakeholder group for solving all problems. Nevertheless, there are certain stakeholders who have a specific responsibility as EENA detailed above. **EENA** considers the successful phasing out of 2G and 3G and the seamless transition to 4G/5G/nG requires close cooperation and collaboration. In this regard there is a coordinating role for the European Commission, BEREC and the national regulatory authorities. Further, there is also a role for industry and end-user representative bodies too in supporting this coordination. For example, ETNO, ECTA, GSMA, BEUC and indeed EENA. **EENA** is available to assist stakeholders on ensuring continuity of access to emergency services during and after the phasing out of 2G and 3G technologies.

**KPN** agrees with BEREC that the phasing out of 2G and 3G concerns many stakeholders from different domains. A multi-stakeholder approach is needed. We believe government cannot lean back and only get involved when complaints or confusion arises; it has an important role to play up front. We believe member states should actively support the sunset of these network technologies and take a role in educating the larger public of its implications; such as the need to use a mobile phone that is VoLTE capable and interoperable with the



mobile networks, and the need to keep up with software updates for this device. National government can start campaigns to highlight the importance of VoLTE capable mobile device, indicating a mobile device is fit for use on the national 4G and 5G mobile networks.

**MVNO Europe** considers that BEREC's final Report could usefully suggest that European Commission should take the opportunity of the RED Directive Delegated Act to promote (for instance in the accompanying Explanatory Memorandum) an important extension to Advanced Mobile Location (AML). The current AML standard (ETSI TS 103 625 V1.2.1) only enables transmission via SMS or HTTPS, thus requiring a functioning SMS Switching Centre (SMSc) or a working data connection with the end-users' device, also while the end-user is roaming. This is not always the case: an SMSc may fail, or fail to be reachable, and a data connection may not be available, e.g. if there is no working SIM card, if the user has turned off data while roaming, if prepaid credit has expired or if the user has been cut off for whatever reason, etc. If the AML standard were (mandatorily) extended by European mandate, e.g. to NG.112 TS 103 479<sup>8</sup>, to organize signaling via SIP/IMS, this would have major advantages (provided that modernized PSAPs are able to receive and process it), enabling AML to function even when no SIM card/active eSIM is in the handset, in case no data connection is available with the end-users' device, and removing a potential point of failure, which is the provider's SMSc or the roaming provider's SMSc. If AML relying on signaling via SIP/IMS would be (mandatorily) implemented, the information will always be relayed over the local SOS emergency APN of the VPLMN, which is able to deliver messages to the local PSAPs. In sum, introducing/mandating AML signaling via SIP/IMS would significantly boost the reliability of mobile caller location, removing failure scenarios that are widespread in the current AML implementations.

**MVNO Europe** also sets out that smartphone manufactures have responsibilities that include the need to ensure the availability of VoLTE and VoWiFi without discrimination, on all capable devices, and for all use cases (not only in the context of emergency communications). It claims it is necessary for BEREC to include, in its final Report, an explicit call on the EU institutions to take measures to:

- Require the entities controlling Operating Systems (and chipsets and firmware) not to discriminate between providers of mobile services.
- Require the entities controlling Operating Systems (and chipsets and firmware) to push updates to all capable existing devices to support and enable VoLTE and SMSoIP by default for all IMSIs (all networks and all SIM cards, regardless of the MNC and IMSI used).
- Mandate that all new devices support and enable VoLTE 'out of the box' for all IMSIs of all M(V)Nos. This should be done in a way to ensure formal standardisation of all forms of usage of VoLTE (and VoNR) (not solely for emergency communications), avoiding the current wide variations in the way VoLTE is implemented.

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<sup>8</sup> NG.112 TS 103 479 specifies the high-level architecture of all-IP PSAP infrastructure and specifically opens the option of the LIS receiving via AML-1 and AML-2 (SMS and HTTP) but also location requests/reports via SIP signalling.



### 3.1. BEREC's assessment and response

BEREC observes that in most cases stakeholders did not answer the specific questions, but set out answers in a more holistic manner throughout the entirety of their submissions.

One stakeholder set out that security might be an issue to be added to the list of impacts. Information provided by other stakeholders seems to counter/contrast with this view. For example, some stakeholders consider that security would be improved by retiring older equipment (rather than increasing the threat area). In particular, it is claimed that network and service compatibility with older devices frequently requires the support of outdated protocols and insecure functions, which, in fact, poses security risks. As such, BEREC does not consider adding security as a new challenge / impact to the draft Report, but BEREC will continue to have regard to the latest security information provided by competent authorities, including relevant information related to security of essential and telecoms infrastructures.

In answering the question on whether there are new or additional challenges/impacts, one stakeholder highlighted that competitive distortions could be added, but BEREC observes that this is already incorporated in the draft Report and no further amendment is required.

In relation to the question of urgency of challenges and impacts, BEREC considers that most stakeholders only provided views consistent with their own business sectors. This is not unexpected. For example, MVNOs and competitive telecoms service providers viewed challenges facing smaller players as urgent, whereas other stakeholders considered interoperability and testing as urgent, and yet another set of stakeholders consider continuity of emergency communications as urgent and/or addressing eCall as a priority. The variety of information received seems to reinforce that this is an interconnected issue, with many different competing stakeholders involved.

BEREC therefore considers that the 2G and 3G phaseout topic will be on stakeholders' agenda for some time, albeit with differing levels of priority, particularly as most challenges / impacts are linked only to when both 2G and 3G networks would be retired, i.e. in the timeframe towards the end of the decade. As a result, BEREC might like to return to this issue in year's time (possibly 2025) as by then, the landscape will be clearer and we can engage with stakeholders on particular challenges, impacts or even explore specific proposals (see next chapter) in detail. Even if BEREC does not have a public deliverable on this work item in 2024, it can continue expert dialogue with for example the RSPG, under the auspices of its working arrangements with RSPG. To be clear, BEREC does not have competence on profile settings and interoperability testing, but it seems that more time is needed by relevant stakeholders to agree on common settings, which may mitigate some of the identified challenges/impacts.

Interestingly, no stakeholders considered any challenge/impact to be minor. In addition, no stakeholders considered that any issue is resolved so far. As a result, it seems to BEREC that progress towards addressing the challenges / impacts is an ongoing matter, and more clarity will come to light as stakeholders lobby for relevant resolutions to their own challenges. It is BEREC's view, it is important that challenges and impacts, such as those highlighted in





the draft Report, are appropriately understood and highlighted. The final BEREC Report will also be a useful input for institutional stakeholders and regulators, even if they do not have a direct role in technology phase out they may have roles to protect consumers. In short, BEREC considers that a key benefit of the Report (and taken together with this summary report on the outcome of the consultation) is that all of the known challenges / impacts are set out in one place, which should improve stakeholders' understanding of the topic.

By asking the questions about the following

- *which stakeholders should be involved,*
- *what should those stakeholders be doing, and*
- *which stakeholders should do more [to address challenges / impacts],*

BEREC was hoping to build a comprehensive stakeholder map. BEREC is aware that views to these answers were sensitive and at times political. Stakeholders have suggested roles for governments, device manufactures, standards bodies, MNOs, regulators, and the European Commission. BEREC considers that no one stakeholder has the urgency, legitimacy and power to address all the challenges / impacts, but is very important that all stakeholders engage on this topic. BEREC is mindful that this can also be a symptom of in-action, as stakeholders might wait for other stakeholders to fix challenges and address impacts. As a result, it is worth monitoring what progress will be made in the next year. Overall, BEREC is pleased with the level of engagement to the consultation, but actions by all stakeholders will be needed to ensure that 2G and 3G phaseout is smooth in Europe. BEREC considers that it has provided useful information about the practices in Member States to date, and this could be reviewed and updated with more real-world experiences in due course.



## 4. Overview of stakeholders' suggested proposals to address identified challenges

Some stakeholders set out proposals or actions on how stakeholders should address the challenges of 2G and 3G phaseout, and this chapter summarises their proposals.

In some instances no details were provided by stakeholders, so it is not clear if their suggestions could be characterized as concrete proposals. For example,

- **STS** sets out that *the measures that would need to be taken at the European level in order to ensure the future functioning of eCall on PS (packet switched) technologies should not induce costs on the citizens, nor on the car manufacturers that are now implementing the service by complying to current regulations*. So while the details of the measure are not set out, it seems clear that whatever the proposed measure is, **STS** considers that no costs should be passed to citizens or car manufacturers.
- Another respondent set out that additional measures specifically addressed to vulnerable customers should be the responsibility of Member States, who should foster the migration to newer technologies to ensure continuity of service with vouchers or other forms of public funding (e.g. one-time subsidy in Hungary). There was however no further detail about how such measures might operate (e.g. vouchers etc).
- Another stakeholder proposed that a suitable informative campaign for all EU citizens should be promoted by the EU institutions to inform EU citizens.
- **EENA** sets out a general point that all technical solutions must be implemented and tested before 2G/3G is completely phased out. EENA also notes that the issue of VoLTE compatibility/interoperability is well-documented for EU citizens roaming outside of the EU. While some of these issues can be resolved through network and handset configuration, there is also a need to define new specifications. In several other examples, the draft Report already highlighted a measure or action that was being implemented in Member States or countries (e.g. service availability / coverage matching measures happening in the UK), so some of stakeholder's suggestions are not new.



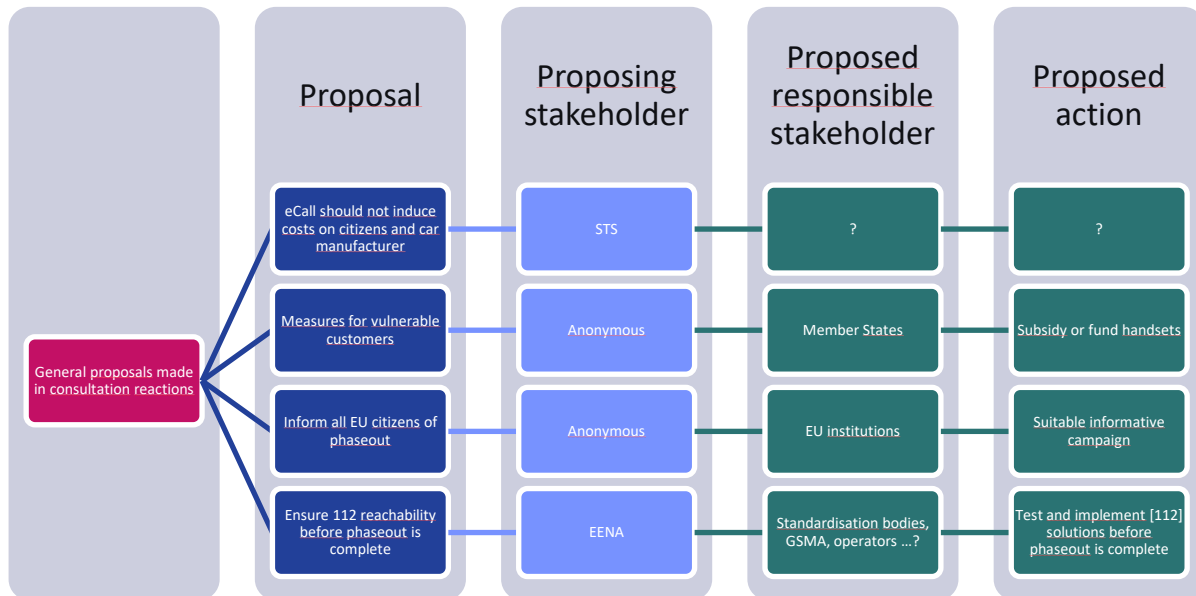


Figure 1: Overview of general proposals of stakeholders in consultation reactions

The more detailed proposals are listed below, grouped in six proposal categories:

- 1) *Implementation of demand side measures (e.g. upgrade incentives)*
- 2) *Minimising negative effects (where older equipment stops working unexpectedly)*
- 3) *More transparency on the operators' 2G/3G phase out plans*
- 4) *Service availability/coverage matching*
- 5) *Addressing eCall in existing cars fitted with 2G modules*
- 6) *Addressing voice call issues, and location information for emergency services*

**Proposal 1: Implementation of demand side measures (e.g. upgrade incentives)**

**ecta** considers that demand side measures such as selected upgrade incentives for specific type of users (consumers, business users, utilities, automotive OEMs, etc.), which are reluctant to migrate, can be truly useful to complete the migration of the users and to enable in such way a truly smooth phase-out of 2G/3G in Europe. **ecta** asks for more emphasis in the final text on the upgrade incentives for customers.



**STS** lists some systems that may stop working after 2G and 3G are phased out: some medical equipment that relies on 2G/3G communication (like defibrillators on mobile resources), POS devices, security and monitoring systems, parking fee payments etc. **STS** states that the costs for replacing the terminals could be covered either by the MNOs or by national programs, to not overburden some vulnerable segments of the population.

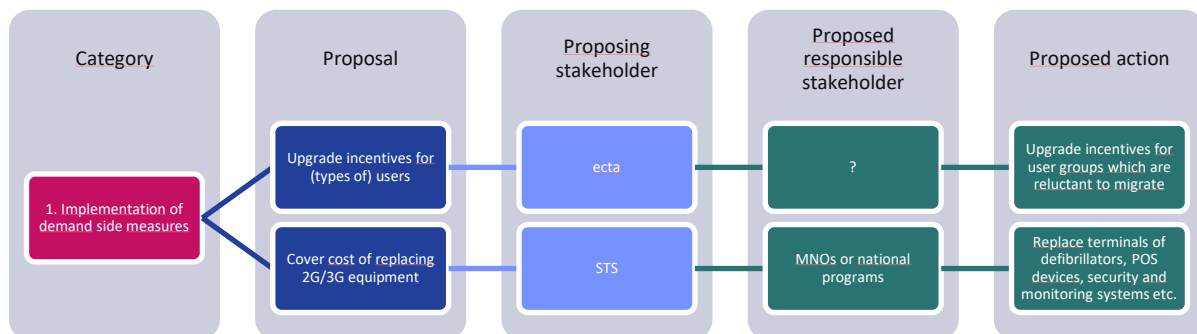


Figure 2: Overview of stakeholders' proposals on implementation of demand side measures

*Proposal 2: Minimising negative effects (where older equipment stops working unexpectedly)*

Similar to the demand side measure proposals, another stakeholder suggested imposing end of sales as a means to minimize certain negative effects, as follows:

One respondent emphasizes that the migration to 4G chipset for IoT services should be promoted in a more courageous way, considering that e.g. the metering market has quite long replace time (rounding ten years). In their view one of the most effective solutions to trigger the migration to 4G (or higher) technologies would be the imposition of an END OF SALES for 2G chipset and related retail terminal equipment at EU level. EU Commission should adopt the ban of sale of terminal equipment without the VoLTE and /or VoNR feature. Following this decision, an End-of-Service date for 2G would also have to be defined at EU level, to be established taking into account the interests of all stakeholders (e.g. utilities and telecommunications companies). Such a prohibition could be integrated with incentives to facilitate adoption of 4G (or higher) technologies.

**ECTA** therefore calls on BEREC to indicate explicitly in the final Report that device producers should initiate and make a special effort for the continuity of voice calls and of emergency communications.

One stakeholder considers that phasing out of 2G technology seems couldn't be done before that all EU Member States have moved their emergency call handling from circuit switched to packet switched technologies.

This stakeholder adds that electricity, water, and gas supplier currently using 2G technologies on their metering equipment, should be requested to move their infrastructures to the newest

technologies like NB-LTE (or NB - IoT), seen that very often metering equipment are already equipped with NB-IOT technologies.

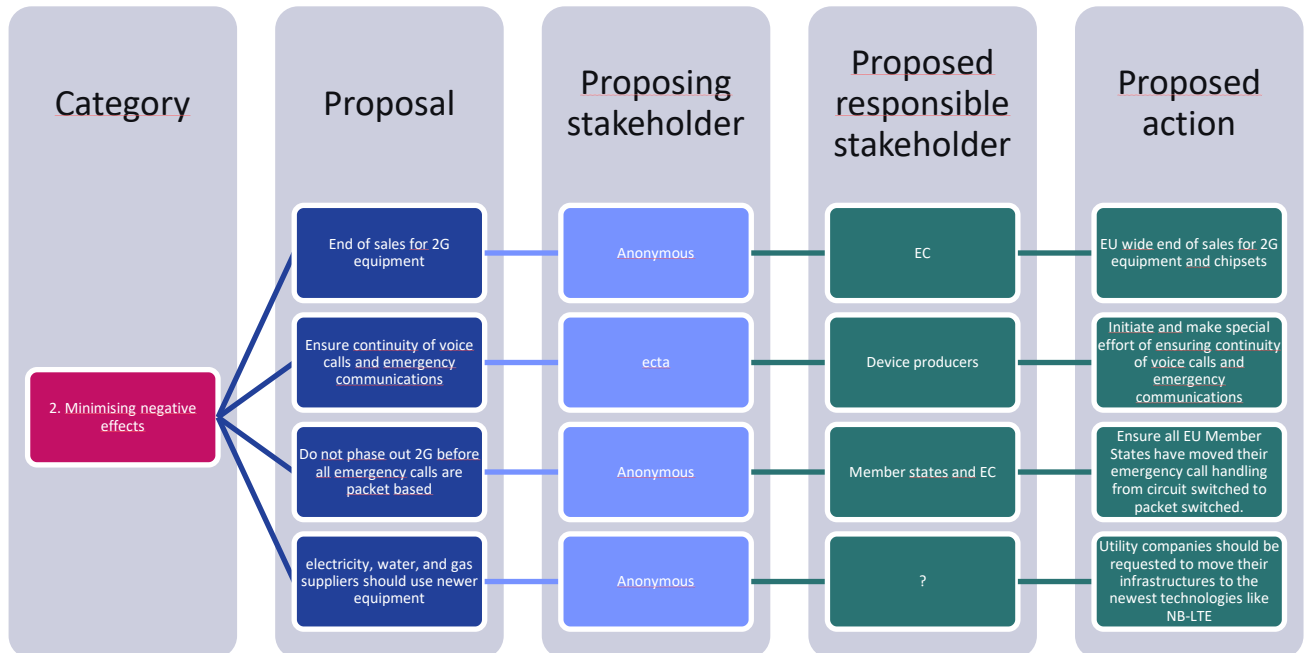


Figure 3: Overview of stakeholders' proposals aiming to minimise negative effects

### *Proposal 3: More transparency on the operators' 2G/3G phase out plans*

**STS** asks for more transparency on the plans of the MNOs to shut down 2G/3G networks, enforced by the NRA, to allow informing the public on the soon-coming changes. This will diminish the impact and costs on the citizens and businesses, allowing them to adapt to the new services and adopt the new technology.

In addition, **ETNO and GSMA** believe that BEREC members shall proactively assist in information sharing around 2G and 3G closing down, as this would also minimize negative effect of equipment stopping to work unexpectedly. By carrying out joint efforts to inform users negative effects can be proactively mitigated.

**ETNO and GSMA** believe that when both 2G and 3G networks are decommissioned in some Member States, BEREC members shall support PSAP in their work of sharing awareness of this to end-users. This is to prevent that such information is only received while end-users enters into a new country with a device that will not support emergency calls.

**Verisure** believes that there should be a requirement on the mobile network operators to provide shutdown visibility in advance to be able to design a cost and functionality efficient migration and secure service continuity to customers, and that regulatory have a role to play here. It is essential to continue requiring the maintenance of the 2G technology until at least



2028 and ideally until after 2030. Annex I of the draft report shows that in 15 out of 25 countries operators have not yet started their transition or announced their plans to switch-off the 2G technologies. This fact is quite relevant and indicates the current lack of visibility about the actual operator’s plans to migrate technologies. This is of utmost importance to ensure service continuity to end users, and with it continuity of the services that companies such as **Verisure** are providing to their customers.

Therefore, visibility of any change impacting the service provided should be informed accurately with at least five years in advance. **Verisure** also sets out that, as a result of the above, there is a strong case for a postponement of a full 2G/3G shutdown.

**Ecta** sets out that all the activities to be performed before the switch off of 2G should be listed, and for each of them a proper schedule should be foreseen at EU level.

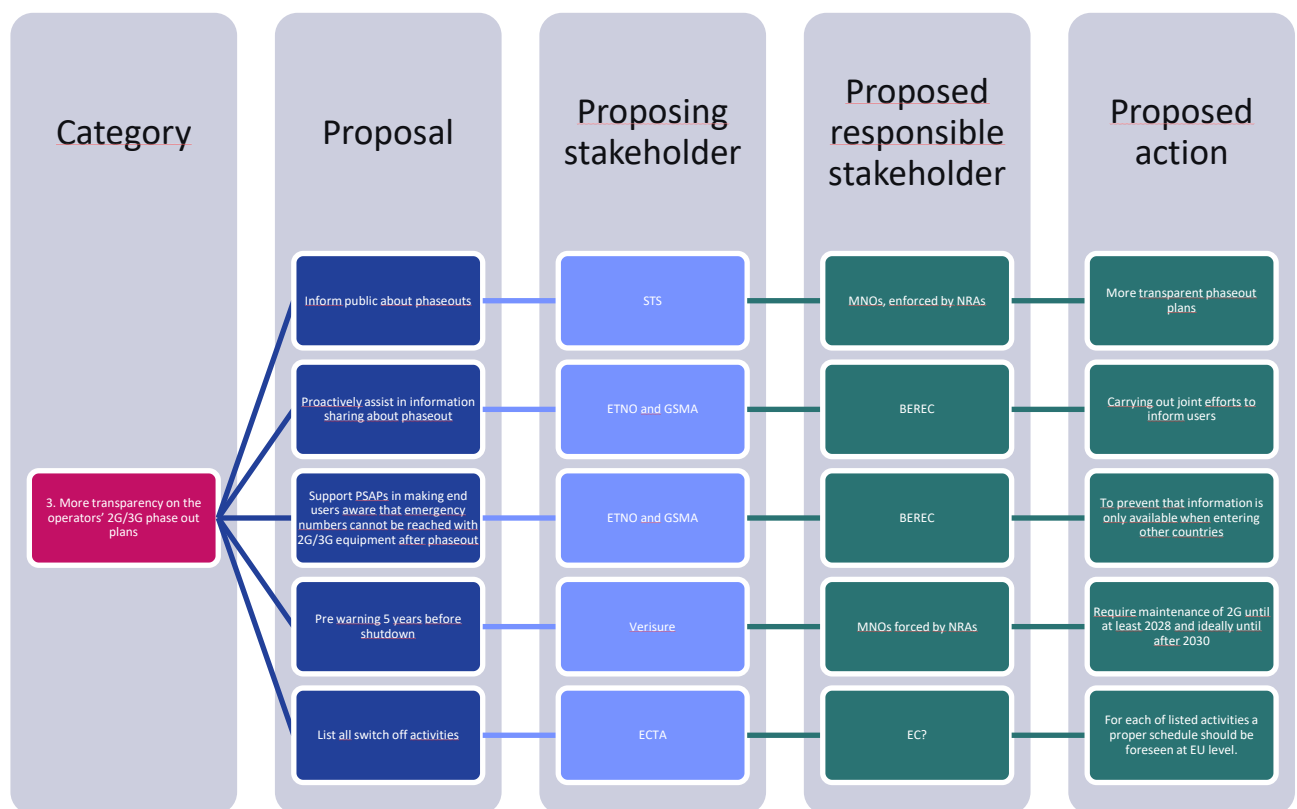


Figure 4: Overview of stakeholders’ proposals about providing more transparency on the operators’ 2G/3G phase out plans

*Proposal 4: Service availability/coverage matching*

**EENA** notes that high levels of geographic coverage is crucial for emergency communications as often high-profile emergency incidents happen in remote areas such as on mountains and



lakes, in forests and offshore. One of the key characteristics of circuit-switched mobile networks is the very high levels of geographic coverage achieved since 2G was rolled out in the early 1990s. Further, the facility to connect to any available network (i.e. national roaming) to make an emergency call when service from the home network is not available has served to maximise coverage for citizens in distress to the greatest extent possible. This national roaming facility must be maintained during and after 2G/3G phase out which will require compatibility/interoperability issues to be resolved between 4G/5G networks and devices.

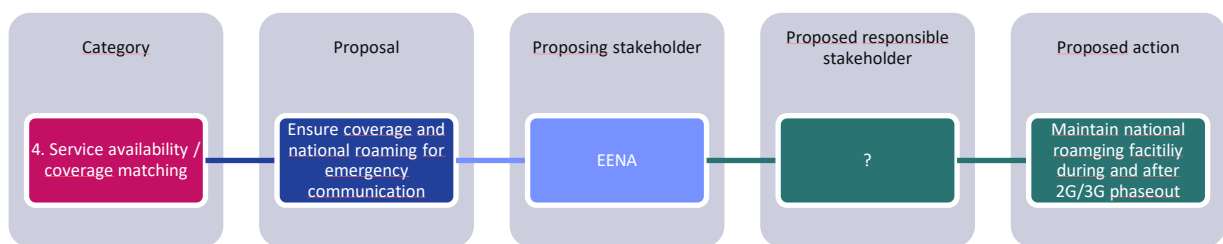


Figure 5: Overview of stakeholders' proposals concerning service availability and coverage matching

#### *Proposal 5: Addressing eCall in existing cars fitted with 2G modules*

According to **CRTV**, it is essential to move on a technology neutrality approach for Emergency Calls and eCalls. Adopting outdated mandatory technology for eCall services now makes it extremely difficult to move away from the old technologies as far as an emergency service is concerned. Solution to this problem is to reserve for an adequate timeframe a small portion of the 2G band for eCall emergency services only.

**EENA** calls for a plan, including timeline to be put in place that will address the introduction of Next Generation eCall and support for, or retrofitting of, legacy eCall devices. This will require changes to the regulatory framework for eCall before any technical work is carried out. eCall currently relies exclusively on 2G/3G technology.

**GSMA and ETNO** The principle of technology neutrality is extremely important for the industry, and we call on BEREC to defend this principle, as deviations have proven counterproductive in the past. The non-technology neutral approach for OEMs only demonstrates too well why it is so important to maintain a technology neutral approach in all legislation (see also section 2 above, *Impact: eCall in existing cars fitted with 2G modules stops working*).

**KPN** draws attention to the urgent need of a policy change to actively stimulate car manufacturers to start equipping cars with future proof "Next Generation" eCall devices. Parallel to stopping this problem from growing, a solution is needed for the millions of cars that drive throughout Europe with these soon-to-be outdated eCall devices.

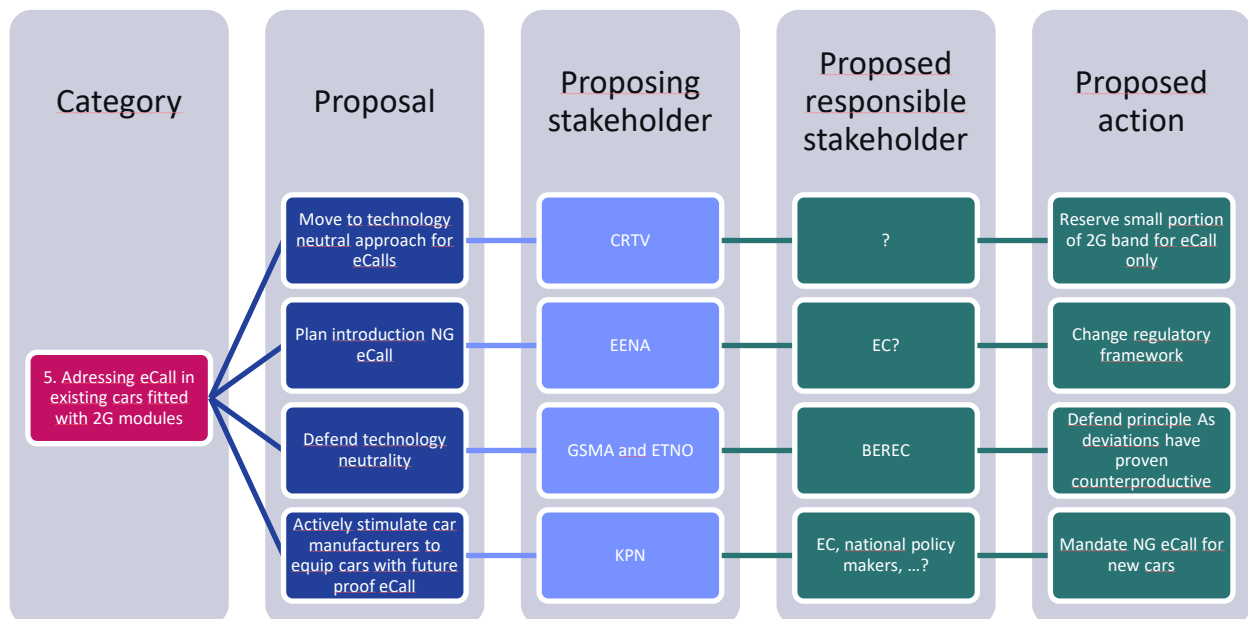


Figure 6: Overview of stakeholders' proposals on addressing eCall in existing cars fitted with 2G modules

*Proposal 6: Addressing voice call issues, and location information for emergency services*

**KPN** sets out that European regulation may alleviate interoperability issues. New regulation may attempt to obstruct the sale of 'unsuitable' mobile devices that cannot interoperate with European 4G and 5G networks. **KPN** sets out that one option is to mandate (for example in the Radio Equipment Directive) that all mobile devices in Europe should be VoLTE capable. A simple sticker with a certificate (like 'VoLTE ok') that is easily recognizable for users may encourage user to buy appropriate devices.

**ecta** sets out that standardisation efforts might not be a sufficient condition to ensure that all devices supporting 4G are able to make emergency calls. It claims that these standardization efforts, while providing an improvement to the issue, cannot be considered sufficient to eliminate the risk of having 4G-capable devices without the correct configuration to call emergency numbers.

**ecta** respectfully invites BEREC to call on the need of a concrete coordinated action by the institutions to make sure that a) all devices are enabled and correctly configured to ensure VoLTE interoperability for emergency communications and b) the minimum setting is pushed on the device through a software update by the device producer or operating system provider.

**ecta** asks the final text of draft report be amended in a way to make sure that BEREC suggests the Commission to proceed with preparing and adopting a Delegated Act to the RED, in order to introduce the obligation that devices entering the EU market support 4G or future generations and are enabled to call emergency numbers regardless of the network on which they operate.





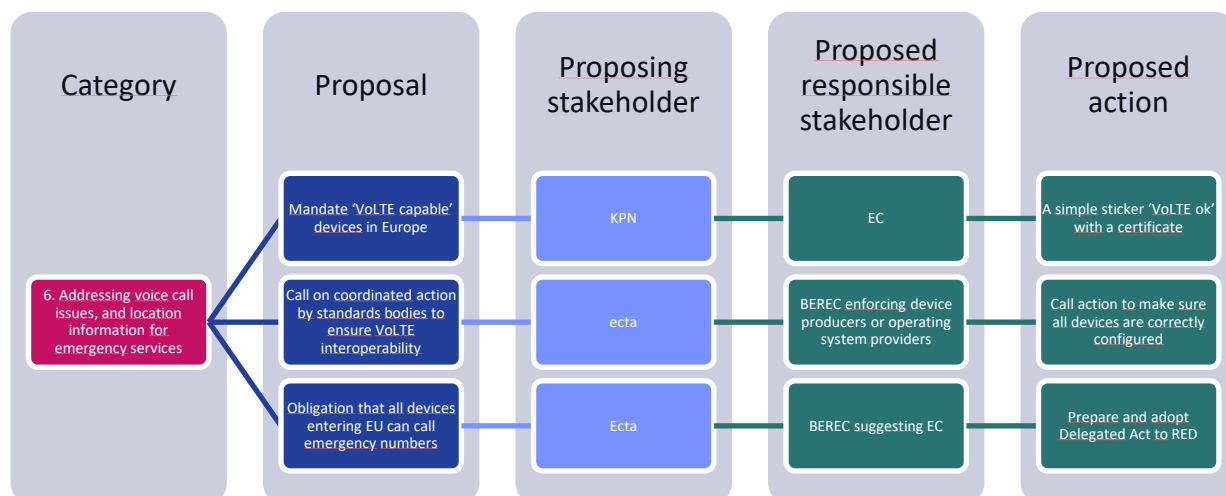


Figure 7: Overview of stakeholders' proposals addressing voice call issues, and location information for emergency services

#### 4.1. BEREC's assessment and response

BEREC thanks all the stakeholders who provided proposals on how to facilitate and address the challenges that emerge from the phasing out of 2G and 3G networks. It is very important to start the conversation about ways to cope with the identified challenges. However, BEREC is not, at this point, addressing the proposed approaches. BEREC will include these in a separate section in its final Report, denoted as supplemental information and mentioning that these originate from the contributors in the public consultation. As mentioned above, BEREC might like to return to this issue in year's time (possibly 2025) as by then, the landscape will be clearer, and we can engage with stakeholders in order to explore specific proposals in detail. Even if BEREC does not have a public deliverable on this work item in 2024, it can continue expert dialogue with for example the RSPG, under the auspices of its working arrangements with RSPG.

In the following paragraphs, BEREC attempts a first examination of the proposals that were submitted in the context of the public consultation.

At the outset, readers will recall that BEREC has included in its report a list of practices that were adopted by several BEREC members in relation to the 2G-3G switch off issue (see page 11 of the BEREC report). One of them was the support to affected users, where in some cases, the service operators supported the affected consumers by providing assistance with the replacement of old legacy mobile devices with other mobile devices that can operate with the new technologies. Another identified practice was the use of notice periods so that stakeholders can make relevant preparations. BEREC observed that in BEREC member-

states, the announcement of clear notice periods is a practice used by most MNOs and it is obviously very important so as to allow the relevant stakeholders to timely prepare for a controlled, well managed phaseout. Some stakeholders identified in their proposals, a role for BEREC members to proactively support MNOs and PSAPs in the dissemination of information to end users about the phase out. BEREC in its report identified that in some countries NRAs have published information and guidance notes on their websites regarding the phase out. In some countries also media coverage has been given to the phasing out of 2G and/or 3G. In some cases, NRAs have cooperated with MNOs, in a form of a public consultation or regular meetings in order to ensure service continuity for consumers during and after the phaseout and that adequate information is disseminated to affected stakeholders timely. At this point, BEREC does not intend to promote or give emphasis to a specific solution/(s), but only identifies the already adopted practices.

Imposition of End of Sales to equipment with 2G chipset and related retail terminal equipment at EU level is a proposal addressed at EC level and, although BEREC sees its merits, also acknowledges the difficulties of its implementation. On the other hand, BEREC also notes the request of some stakeholders that the maintenance of these equipment continues until at least 2028 and ideally until after 2030, in order to ensure service continuity for end users.

BEREC acknowledges the importance of maintaining the coverage level and the service availability especially for emergency calls after the 2G-3G phase out. In its report BEREC has referred to this important issue in chapter 2 (see page 13 “Service availability/coverage“ and page 16 “Emergency calls not always possible”). BEREC welcomes EENA’s proposal to ensure that national roaming facility is maintained during and after 2G/3G phase out. In addition, in the section of identified practices of its report BEREC included that in some countries National Regulatory Authorities, in contact with Ministries and Other Competent Authorities have provided recommendations related to coverage matching what was previously offered (a recommended MNOs’ best practices). BEREC may assess further this proposal as well as its implementation in its future work.

Several stakeholders emphasized the need to address the problem with cars equipped with eCall devices supported only with 2G/3G technology. Some proposals ask for a technology neutral approach while at the same time, proposing a very technical solution. All stakeholders that expressed their views in the public consultation agree that the 2G mandatory technology should be removed from legislation. One 'last resort' option proposed was that of keeping a small portion of the 2G band for eCall emergency services only. BEREC has also identified this issue in its report (“eCall in older cars stops working”, see page 14) and has acknowledged that although BEREC is aware that the European Commission is working on addressing next



generation eCall, however this may not address the legacy issues associated with existing cars<sup>9</sup>.

Some stakeholders suggest that EU legislation should be introduced to enforce the use only of VoLTE capable equipment within the EU. BEREC acknowledges the importance of ensuring that all devices are enabled and correctly configured to ensure VoLTE interoperability especially for emergency communications. BEREC may assess relevant aspects of the proposals in its future work. For example, it seems to BEREC that not all stakeholders are convinced about the ongoing standardization efforts, and therefore the proposal for a sticker / badge ('VoLTE capable') to be implemented would need detailed investigation by relevant stakeholders. Such 'stickered' devices should be able to make and receive voice calls (and send and receive SMSs) on ALL mobile networks in Europe, to enable roaming and changing operator subscriptions. On the one hand, one stakeholder sets out that while providing an improvement to the issue, standardization might be insufficient to eliminate the risk of having 4G-capable devices without the correct configuration to call emergency numbers. On the other hand, yet another stakeholder sets out that whilst it is true that discussions in 3GPP sometimes lead to optionality, 3GPP is the organization to provide solutions to different requirements, and it is up to the user organizations to select which of the requirements to be the minimum global requirement. [emphasis added]. BEREC considers that if interoperability / handset configuration issues create problems for users contacting emergency services in practice, the resultant impact would be quite serious (see also section *Impact: Emergency communication not always possible – at page 11 above*). Presently, BEREC is not aware of the extent of the potential handset configuration issues, but it might become clearer after the practical implementation of phaseout occurs in the coming years.

Figure 8.0 below sets out a high-level summary of some the relevant contents of this chapter. BEREC includes this in the final Report as supplemental information, which is intended to add to the overall information gathering exercise conducted in this consultation.

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<sup>9</sup> BEREC is aware that the EC is advancing its thinking about two aspects on the eCall issue, see footnote 5. However the published proposals do in its current form not yet solve the service continuity issue of eCall equipment built in existing cars.



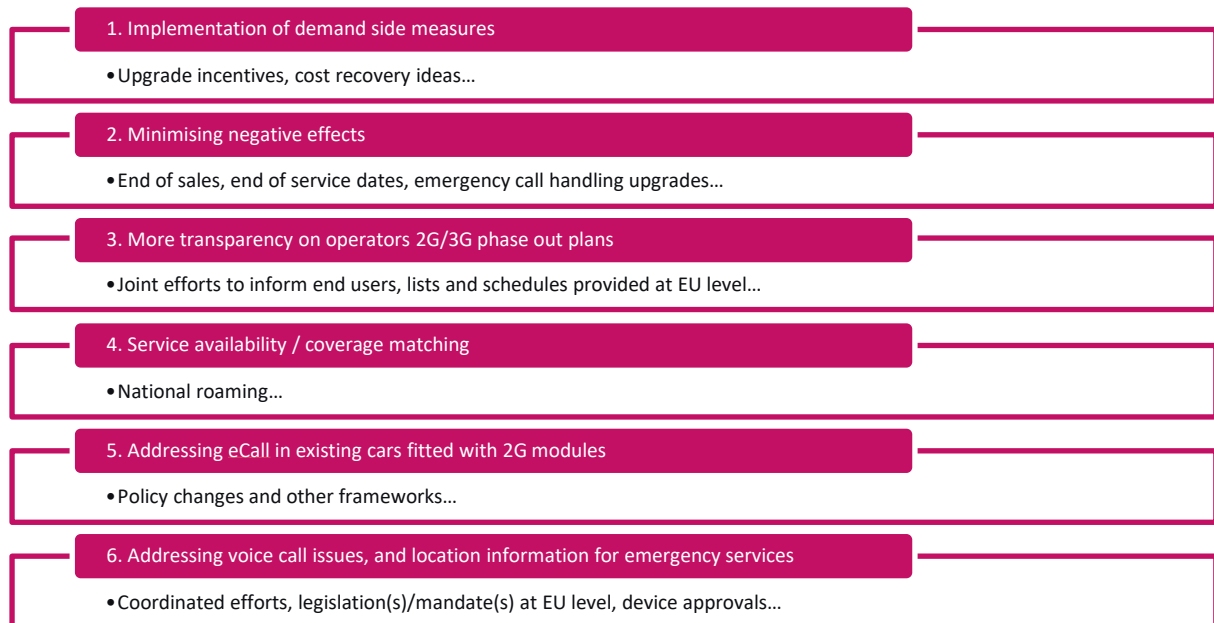


Figure 8.0 High-level summary of stakeholder's proposals on addressing the impacts and challenges from 2G and 3G phaseout (copied to Chapter 4 of the Final Report).



## 5. Specific comments requesting BEREC to amend text

This chapter provides a summary of specific comments requesting BEREC to amend text at various sections of the report.

### *Amendment at introduction (section 1)*

According to **ETNO and GSMA** BEREC report relies on 2021 data provided by GSMA to assess the share of subscribers linked to 2G and 3G technologies, concluding that this share is significant. As a result, **ETNO and GSMA** considers that the report does not give enough relevance to the impact of operators' legacy network shutdowns already underway in several Member States, as well as the natural uptake of new technologies by customers in the last two years.

### *Amendment to country case – France (section 1.2.1)*

**ETNO and GSMA** make a point that the statement made on page 6 of the draft report, “*site sharing between one operator willing to switch-off and another willing to keep this technology operating*” should instead read “active network sharing...”, as with passive site sharing, there is no issue.

### *Amendment at meter replacement (section 2.1 and 3.2.1.2)*

**ETNO and GSMA** propose to supplement the part of “meter replacement before end of life” (p.14 from the draft report) with the following aspects (see also chapter 1.1 above). Technical lifetime not only implies the most basic functioning of the device, but also the safety and security of the device, including not endangering network integrity. Thus, “end of life” should not mean “preferably decades” (p.25 from the draft report), but be based on availability of security updates or economic depreciation, whichever is shorter.

### *Amendment at NRA information (section 2.1.1, CRC Bulgaria notes)*

**ETSI** proposes to reword the following text from the draft report:

- “*lies is the lack of VoLTE standardization and its impact on voice calling. Current 4G/5G Voice over LTE (VoLTE) standards do not ensure interoperability between networks and devices.*” with the following:
- “*lies in the past implementation not adopting some of the VoLTE standards features and impacting voice calling. Some 4G/5G voice over LTE implementations do not ensure interoperability between networks and devices.*”

**ETSI** explains that it is not because of the lack of VoLTE standardization that there are difficulties with voice calls or SMS while roaming, but because of the past implementations. IT sets out that there are two major causes of the failing roaming calls (and emergency calls) in the past implementations of VoLTE. First, it can be the device settings, where some of the manufacturers have disabled VoLTE functionality for networks that they have not unilaterally (one-to-one) tested. It was only recently (in late 2021) that VoLTE functionality was enabled for all networks. Second, it can be the operators' settings, where no roaming agreements



between operators automatically led to disabling VoLTE calls. Nevertheless, **ETSI** considers that emergency calls should have worked according to the standards.

*Amendment at stakeholder analysis (figure 4)*

**MVNO Europe** asked to be added as a relevant stakeholder association in Figure 4, at the bottom of column 2 in the final BEREC Report.

*Amendment at stakeholder analysis (Emergency services, Section 3.2.1.4)*

**ETNO and GSMA** invite BEREC to give evidence in the report of the reassurances provided by telecom operators to EENA (page 27) with regard to the transparency of information provided to customers roaming in areas where 2G/3G networks are no longer available, as the report indicates that *“the organization aims to ensure that end-users are well aware of this issue, so that they may prepare accordingly”*.

*Amendment at stakeholder analysis (MNO, Section 3.2.2.1)*

**ecta** recalls its contribution to the BEREC public consultation on BEREC 2023 Work Programme on the 2G/3G phase-out. **ecta** invites BEREC include information it previously provided BEREC during the initial public consultation on the BEREC 2023 Work Programme<sup>10</sup>:

*Amendment at stakeholder analysis (GSMA, Section 3.2.2.3)*

**MVNO Europe** considers that the role of standardisation bodies is relatively understated in the draft Report. There are clearly opportunities to leverage standardisation for better outcomes in the context of the phasing out of 2G and 3G, while enabling smooth and effective transition to newer generations of mobile technology, in the interests of all involved. The GSMA Network Settings Exchange (NSX)<sup>11</sup> is not mentioned in Section 3.2.2.3 where BEREC recognizes the GSMA as an important stakeholder. The GSMA NSX is a tool to streamline the implementation of settings relevant for (among others) enabling VoLTE and VoWiFi. As such, the NSX is a crucial potential solution for improving VoLTE and VoWiFi enablement. Unfortunately, it is not used to its full extent by smartphone and other device manufacturers. Participation in the GSMA's NSX Settings Exchange by Original Equipment Manufacturers

<sup>10</sup> The text ecta requests to include is as follows:

*“ecta is aware that concerns have emerged, notably relating to VoLTE-based emergency calling while roaming and eCall, in the context of planned shut-downs of 2G and 3G networks. BEREC’s attention to the topic is welcome, as is the fact that a public consultation will be held on a draft BEREC Report as soon as Plenary 2 2023. However, ecta wishes to emphasise that the answer to certain challenges is not to delay shutdowns. The answer is to decisively ensure:*

- *VoLTE interoperability, and notably to require all handset manufacturers to support VoLTE-based emergency calling by default;*
- *That companies that embed mobile connectivity in hardware (e.g. in the connected mobility sector) include forward-looking technology in their products and carry out the upgrades to 4G/5G that have been known to be necessary for a decade (eCall, M2M/IoT).*
- *That mobile network operators, customers, and society at large are not held back from reaping the benefits from a long-planned transition to more efficient technologies, including in terms of improvements to environmental sustainability”*.

<sup>11</sup> <https://www.gsma.com/services/nsx/>



(OEMs) is not universal and not mandatory, and is thus insufficient to ensure that all MNO/MVNO and OEM combinations function appropriately. Smaller MNOs and MVNOs can benefit from the NSX if they are not able to reach agreement with handset manufacturers on the implementation of appropriate settings on a bilateral basis, but it would provide a comprehensive solution if all ecosystem participants used it.

**MVNO Europe** asks BEREC to include key messages in its final Report, specifically addressed to standardization organizations 3GPP and ETSI, urging them to work actively on the issue of phasing out of 2G and 3G, and declare mandatory the use of the GSMA NSX for all handsets and other devices.

*Amendment at stakeholder analysis (3GPP, Section 3.2.3.1)*

**ETSI** proposes to reword the following text from the draft report:

- *“Until recently most interoperability problems were invisible due to successful backwards compatibility and co-existence of newer and older technologies. There was always an older, more stable version of a service available that was automatically used when not all equipment involved in a new variant proved to be interoperable. 3GPP is a very diverse organization and consensus in some cases leads to newer standards with too many degrees of optionality, causing interoperability issues. Other ...”* with the following:
- *“There have been issues with some features of VoLTE standards in the initial VoLTE deployments since 2012. However, industry inputs have stabilized the standards, and they have already provided enough interoperability for the basic services. Especially in emergency calling, it already had little room for interpretation and would operate well if implemented accordingly. 3GPP is indeed a very diverse organization, and consensus in some cases leads to newer standards with too many degrees of optionality. To compensate for this, other...”*

**ETSI** clarifies that there were indeed some issues with VoLTE standards with fragmentation and maturity in the initial deployments in 2012. However, since the deployments, many stakeholders gathered in industry fora, such as the GSMA and the SDOs in 3GPP, to work out solutions to fragmentations, and this enabled the world's first VoLTE interconnection in 2015.

*Amendment at stakeholder analysis (Smartphone manufacturers, Section 3.2.4.3)*

**MVNO Europe** welcomes BEREC's attention to the role of Operating Systems (alongside chipsets and firmware), but considers that the description of the issues that arise is too limited. **MVNO Europe** provides more insights about smartphone manufacturers' role in the issues related to the proper functioning of VoLTE, especially the case for Full MVNOs that operate under their own Mobile Network Code and IMSI range and operating their own IMS VoLTE core, which are presented in the “Competition issues for small MNOs and MVNOs” of this summary report.

For example, **MVNO Europe** sets out that BEREC's final Report should contain a strong and explicit call on major smartphone manufacturers to take their responsibilities relating to the phasing out of 2G/3G (see also Chapter 4 above for MVNO Europe's view on this).



## 5.1. BEREC's assessment and response

### *Amendment at introduction (section 1)*

BEREC will amend the document on p.4 by not mentioning the values provided by GSMA. Published values have a limited time of tenability and are replaced by updated versions at a fast pace, therefore the paragraph will be amended as follows:

*“According to the GSMA Mobile Economy Europe 2021 report, some operators in Europe still had significant shares of subscribers linked to 2G and 3G technologies. However, due to time passing and recent phase out of 3G in many countries, the corresponding values are subject to timely modifications..”*

### *Amendment at country case – France (section 1.2.1)*

BEREC will amend the document on p.6 by deleting *site sharing* and replacing by *active network sharing* as follows:

*“From an operational viewpoint: 2G (then 3G) switch-off is expected to be led at once over the whole territory. One issue remains though: active network sharing between one operator willing to switch-off a technology and another willing to keep this technology operating.”*

### *Amendment at meter replacement (section 2.1 and 3.2.1.2)*

BEREC will amend the document on p.14 by deleting the focus on *meters* and replacing it by *M2M devices* and adding the fact that these devices are still dependent on 2G/3G technologies and, due to the phase out, are to be replaced before the originally expected end of life, as follows:

*“M2M device replacement before end of life*

*Many older M2M devices such as meters do not support 4G and later mobile technologies and are still dependent in many geographies on 2G/3G technologies. Depending on the connectivity solutions installed in these devices, to address this issue may involve installing whole new units before the originally expected end of life, because the radio device is in many cases an integral part and cannot be replaced separately.”*

### *Amendment at additional NRA information (section 2.1.1, CRC Bulgaria notes)*

BEREC will amend the document on p.18 by replacing...

*“CRC (Bulgaria) notes that, regarding the problem with ensuring customer capability to make emergency calls, the provision of voice calls and text messages over 4G and 5G in general, or complaints regarding difficulties with voice calls or SMS when roaming and issues regarding eCall support, ~~lies is the lack of VoLTE standardization and its impact on voice calling. Current~~*





4G/5G Voice over LTE (VoLTE) standards do not ensure interoperability between networks and devices lies in implementations not adopting some of the VoLTE standards features and impacting voice calling. Some 4G/5G voice over LTE implementations do not ensure interoperability between networks and devices. 112 calls and eCall are in that cases not guaranteed, particularly when roaming. Operators may demand 2G/3G for 112 and block VoLTE emergency calls.

*Amendment at stakeholder analysis (figure 4)*

BEREC will amend the figure in the document on p.23 to include *MNVO Europe* in the column of Service Providers & Associations.

*Stakeholder analysis (Emergency services, Section 3.2.1.4)*

BEREC understands that ETNO and GSMA point out that operators have provided information to EENA regarding informing customers about roaming areas where 2G/3G are no longer available. We can indicate by the end of the paragraph: “Telecom operators reassured EENA to guarantee as much as possible transparency to customers regarding roaming areas where 2G/3G are no longer available.”

*Stakeholder analysis (MNO, Section 3.2.2.1)*

the following text is included in the report:

In a reaction to the BEREC work item for this report ecta states: “*ecta is aware that concerns have emerged, notably relating to VoLTE-based emergency calling while roaming and eCall, in the context of planned shut-downs of 2G and 3G networks. BEREC’s attention to the topic is welcome, as is the fact that a public consultation will be held on a draft BEREC Report as soon as Plenary 2 2023. However, ecta wishes to emphasise that the answer to certain challenges is not to delay shutdowns. The answer [according to ecta] is to decisively ensure:*

- *VoLTE interoperability, and notably to require all handset manufacturers to support VoLTE-based emergency calling by default;*
- *That companies that embed mobile connectivity in hardware (e.g. in the connected mobility sector) include forward-looking technology in their products and carry out the upgrades to 4G/5G that have been known to be necessary for a decade (eCall, M2M/IoT).*
- *That mobile network operators, customers, and society at large are not held back from reaping the benefits from a long-planned transition to more efficient technologies, including in terms of improvements to environmental sustainability”.*

*Stakeholder analysis (GSMA, Section 3.2.2.3)*

Response: The NSX initiative will be referenced within the report, as it is a good medium for small OEMs to get a network configuration guaranteeing VOLTE functionality and for small MNOs/MVNOs to get guarantee of having their configuration embedded within every terminal. In the GSMA stakeholder engagement paragraph, we will add: “The GSMA NSX is a tool provided by the GSMA to streamline the implementation of settings relevant for (among others) enabling VoLTE and VoWiFi. This can be used by relevant stakeholders to implement these configurations for handsets and other devices in order to streamline the adoption and interoperability of VoLTE (and other services such as VoWiFi)”.

*Stakeholder analysis (3GPP, Section 3.2.3.1)*



BEREC suggests no change, because the original message is broader than the new proposal, the proposal omits the observation that until now fall back to older standards generations and its implementations were possible, and after phaseout of 2G and 3G that will no longer be possible anymore.

*Stakeholder analysis (Smartphone manufacturers, Section 3.2.4.3)*

The issue has been introduced in the “competition issues for small MNOs and MVNOs” section. BEREC suggests no change in this section, but it sets out further details on MVNO Europe’s view under the *Question: What stakeholders should be involved in efforts to meet the challenges/impacts? How should they contribute?* Stakeholders should note that BEREC does not have a competence on device manufacture settings, when considering MVNOs Europe’s views.

