Body of European Regulators for Electronic Communications

BEREC

BoR (20) 131

BEREC input on EC's request for the preparation of the legislative proposal for the new roaming regulations

30 June 2020

CONTENTS

Executive summary and main findings

The Body of European Regulators for Electronic Communications (BEREC) hereby submits its input to European Commission's (EC) request for additional expert views in the preparation of the impact assessment and the legislative proposal for the new Roaming Regulation. This input is complementary to the two documents, the BEREC opinion on the functioning of the roaming market as input to the EC evaluation[1] and the BEREC supplementary analysis on wholesale roaming costs[2], which BEREC submitted in 2019 to the EC.

BEREC bases its input mainly on the data collected via a joint EC/BEREC survey among Mobile Network Operators (MNO), Mobile Virtual Network Operators (MVNO) and National Regulatory Authorities (NRA) that was carried out in April 2020. In addition, BEREC also sought input from NRAs on 112 number and Value Added Services (VAS).

BEREC considers that the Roaming Regulation and the introduction of Roam Like at Home (RLAH) is a clear success for the end-users and a substantial contribution to the further completion of the single market. Nevertheless, BEREC identified a few issues for improving the Roaming Regulation, that are analysed below.

Regarding quality of service (QoS) in roaming, BEREC concludes that the review of the Roaming Regulation should consider further measures both at the retail and wholesale level. In particular, at the retail level it must be made clear that the home operator does not alter the conditions during roaming in the European Economic Area (EEA). At wholesale level, the regulation should ensure that a request for access to mobile technologies that are offered by the domestic operator to its customers and which are technically available from the visited network, should be considered as a default to qualify a reasonable request. Article 3 of the Roaming Regulation and the wholesale caps should be consistent with any QoS requirements that might be introduced in order to allow operators to comply with requirements in a sustainable way.

BEREC also examined value added services (VAS) and identified a lack of transparency both at the wholesale and retail level related to calls to VAS in roaming situations. This intransparency could lead to an unpredictable situation for end-users and mobile operators and in some cases to bill shocks. BEREC assessed a number of measures that could be considered but would also like to point out that for most of the proposed measures a more detailed cost-benefit analysis is needed. However, in order to improve regulatory certainty, BEREC believes that there is a need for more clarity in the roaming regulation with regard to VAS. In addition, BEREC considers that the issue of VAS in roaming scenarios has to be tackled in a broader regulatory approach, taking into account the overall legal framework.

As regards the sustainability of RLAH, BEREC provides a more detailed analysis of the measures proposed in its June 2019 Opinion. In addition, it includes more information on the

[1] https://berec.europa.eu/eng/document_register/subject_matter/berec/opinions/8595-berec-opinion-on-the-functioning-of-the-roaming-market-as-input-to-ec-evaluation

[2] https://berec.europa.eu/eng/document_register/subject_matter/berec/opinions/8756-berec-supplementary-analysis-on-wholesale-roaming-costs

complementarity to Article 3 of the Roaming Regulation, the impact, the effectiveness and the efficiency of the proposed measures.

Machine to Machine (M2M) and Internet of Things (IoT) services were further analyzed in BEREC's input. BEREC concludes that in general more clarity concerning permanent roaming for M2M and potentially IoT in the Roaming Regulation would be beneficial to both established market players as well as market entrants. BEREC suggests that the EC evaluates whether some provisions should be introduced in Article 3 of the Roaming Regulation to include amendments about permanent roaming for M2M connectivity services. In addition, for the review of the Roaming Regulation it is not sufficient to take into account permanent roaming only for M2M connectivity services. Also the impact of permanent roaming on IoT connectivity services needs to be analysed given the great variety of services that will be available . Finally, regarding the possible charging mechanisms BEREC is convinced that there is a need to revise the existing regulated charging model that is based on volume alone. The currently available cost model should be updated in order to cover this type of services as well as 5G.

The EC also asked for BEREC's input on the enforcement of emergency services. According to BEREC's analysis, the EC may clarify in the Roaming Regulation which Member State (MS) (home or visited) must exercise its competences for supervising the obligations following Article 109 (6) of the EECC in roaming scenarios, both at the retail level and wholesale level. Although there seem to be no customer complaints at the retail level and no disputes at the wholesale level, a clarification about bearing costs at the wholesale level would give more regulatory certainty especially for NRAs. For free–of-charge calls to emergency services (retail obligation) BEREC considers it reasonable that the domestic NRA of the roamer's home MS should be responsible to supervise and enforce this obligation as the home operator bills its roaming customers and not the visited operator. For directing the call to the most appropriate PSAP and free-of-charge (wholesale obligation), BEREC is of the view that the NRA of the country where the emergency traffic is transferred to (i.e. in a roaming scenario from the visited network in the visited country) should be responsible to supervise and enforce this obligation. As regards charges for supplying and directing caller location information to the most appropriate PSAP, BEREC considers that this should be settled between the network connecting or providing access to the PSAPs and the party responsible for the PSAPs.

Finally, regarding the impact of the recent COVID-19 pandemic measures, BEREC considers that these measures have a significant impact on the roaming market. However, BEREC is of the view that the recommendations proposed for the review the Roaming Regulation in this document will not be affected by the pandemic. BEREC expects that the negotiations on the Roaming Regulation to not be finished before the end of travel bans due to the COVID-19 crisis.

1. Introduction and objectives of the document

On 24 April 2020, the BEREC received a letter from the EC asking for additional expert views in the preparation of the impact assessment and the legislative proposal for the new Roaming Regulation. This request is in addition to the inputs already provided to the EC in 2019 – the "BEREC opinion on the functioning of the Roaming market as input to the EC evaluation"[3] (hereinafter "BEREC Opinion"), as well as the "BEREC supplementary analysis on wholesale roaming costs"[4]. Furthermore, BEREC also collects numerous data about the roaming market from both operators and NRAs. These data are analysed and published in the BEREC international roaming benchmark reports (twice a year) as well as the BEREC Report on transparency and comparability of roaming tariffs (once a year).

With this new request the EC requests more detailed information about the costs/benefits of the Roaming Regulation, Quality of Service (QoS) in roaming, value added services, the sustainability of RLAH, as well as about M2M services and permanent roaming. Last, but not least, the EC is also interested in information about the monitoring of free-of-charge access to emergency service 112 and whether the COVID-19 crisis will impact the EEA International Roaming market. BEREC's input is anticipated by the end of June 2020.

The data used for the additional analysis is from a joint EC/BEREC survey among MNOs, MVNOs and NRAs that was carried out in April 2020. All together BEREC received answers from 87 MNOs, 106 MVNOs and 28 NRAs.

In addition, due to the detailed questions of the EC directed to BEREC, on short notice, BEREC has also conducted several internal questionnaires mainly answered by its members in order to get a complete picture of the issues raised in the EC request.

[3] See, https://berec.europa.eu/eng/document_register/subject_matter/berec/opinions/8595-berec-opinion-on-the-functioning-of-the-roaming-market-as-input-to-ec-evaluation

[4] See, https://berec.europa.eu/eng/document_register/subject_matter/berec/opinions/8756-berec-supplementary-analysis-on-wholesale-roaming-costs

2. Overall performance of the RLAH rules

In its letter to BEREC, the EC is requesting information about the overall performance of the RLAH rules. Following questions were addressed to BEREC:

- *In BEREC's view, to what extent has the RLAH reform achieved its objectives of (a) development of the internal market and (b) promotion of the interests of EU citizens?*
- *How would BEREC assess the efficiency (cost-benefit relation) of the RLAH rules, as regards the administrative and regulatory costs (a) borne by BEREC and the NRAs and (b) borne by the operators (taking also into consideration the input received in the 2020 joint Commission BEREC survey)?*
- *Has BEREC identified any part of the Roaming Regulation where there is room for improvement in terms of simplification, elimination of regulatory burden or reduction of associated costs?*

The following subchapters are providing answers to three questions above.

2.1. To what extent has the RLAH reform achieved its objectives?

As BEREC already stated in its opinion published in June 2019, the abolition of retail roaming charges in the EEA that marked the introduction of RLAH in June 2017 has proven to be a clear success and a substantial contribution to the further completion of the Single Market. The compliance with the Roaming Regulation was very high and consumers could benefit from RLAH and a Fair Use Policy (FUP) without delay. This is backed by the fact that usage of regulated roaming services has significantly increased since June 2017, especially regarding data roaming services. Before the introduction of RLAH, roaming was perceived as an expensive service by end-users and a significant number of customers switched off data roaming while being abroad, using alternatives such as WI-FI instead. This behaviour seems to have completely changed. In fact, the EEA average roaming consumption of data services increased by 800 % from Q3 2016 to Q3 2019 (from 60 MB per month to 540 MB per month per roaming subscriber).

In the legislative process of the Roaming Regulation negotiations including RLAH, many stakeholders, including BEREC, voiced concerns about the potential impact on domestic and rest of world (RoW) roaming prices. However, as the BEREC analysis shows the introduction of RLAH had no major impact on prices or consumption patterns for both domestic and RoW services.[5] Furthermore, there is currently no indication that RLAH has any serious impact on the availability of domestic offers,[6] which is further corroborated by the evidence available to BEREC that the overall domestic tariff structure in most cases remains unchanged. In addition,

[5] Apart from the BEREC opinion, see further information in the published BMK reports (for example https://berec.europa.eu/eng/document_register/subject_matter/berec/reports/9031-international-roaming-berec-benchmark-data-report-april-2019-8211-september-2019). As described in Annex I of this report, there are some constraints in analysing and obtaining conclusions on the evolution of prices of mobile domestic services.

[6] This might also be because of the safeguard mechanisms introduced in the Roaming Regulation with the aim to address potential waterbed effects.

as BEREC has observed, operators across Europe have in most cases not raised prices for domestic mobile service or reduced the volume of services included in their tariff plans. However, BEREC notes that there have been some changes to domestic tariff plans after the introduction of RLAH - although the price evolution also depends on other additional factors.

2.2. Assessment of the efficiency of the RLAH rules

With regard to the first part of the question, i.e. the benefit of RLAH rules, BEREC refers to the answer in question 2.1. Hereinafter, BEREC focuses on the costs borne by BEREC, the NRAs and operators. The results are based on the feedback to the joint EC/BEREC survey.

2.2.1. NRAs regulatory costs

The analysis of the regulatory costs of NRAs is split into i) the monitoring of the implementation of the regulation, ii) resources for formal proceedings and iii) efforts due to sustainability procedures.

Ad i) In total, BEREC received 27 responses from NRAs about the effort for the monitoring of the implementation of the regulation. The result of the survey shows that the situation is quite heterogeneous. NRAs spent between 10 and 365 person days for monitoring the implementation of the Roaming Regulation (see Figure 1). This includes the reporting (e.g. benchmarking and other questionnaires), but excludes formal proceedings and work on derogations. According to the data, 4 NRAs spent up to 20 person days, 13 NRAs up to 40 days, 2 NRAs up to 60 days and 8 NRAs more than 60 person days in the monitoring of the roaming regulation.

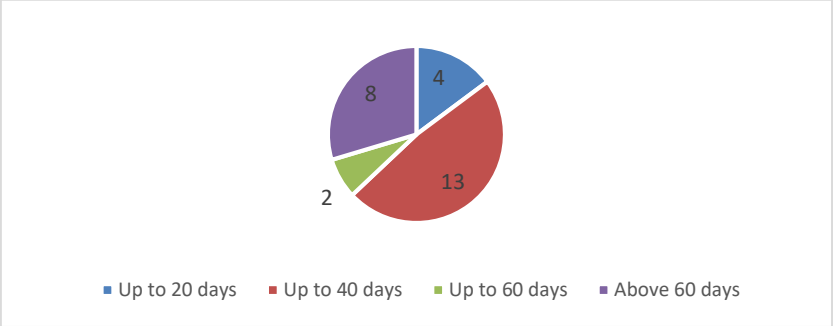

Figure 1: Number of person days spent per NRAs in 2019 for monitoring the implementation of the roaming regulation, including reporting (Answers from 27 NRAs included

Ad ii) In total, BEREC received 24 responses regarding the amount of person days spent for formal proceedings regarding violations of the Roaming Regulation (see Figure 2). While 4 NRAs did not provide any feedback, 12 NRAs (out of the 24 NRAs that provided an answer) did not spend any resources. This could imply that those NRAs did not have any formal proceedings. With regard to the other 12 NRAs, 5 NRAs invested up to 20 person days, 3NRAs up to 40 person days, 2 NRAs invested up to 60 person days and 2 NRAs more than 60 person days. On average, an NRA needs about 17,9 person days per formal proceeding (see Figure 3).

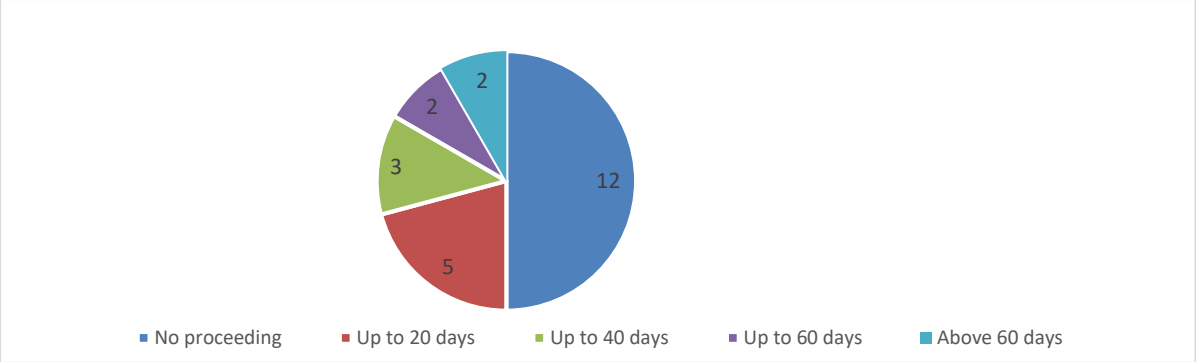

Figure 2: Number of days spent per NRA in 2019 for formal proceedings for violations of the roaming regulation (answers from 24 NRAs included)

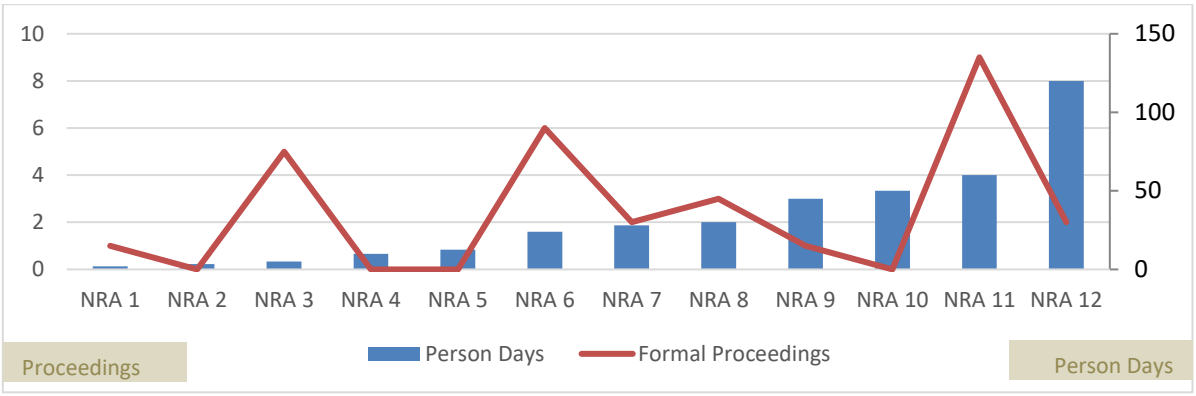

Figure 3: Effort put in person days from NRA in 2019 for informal proceedings in relation to number of formal proceedings (answers from 12 NRAs included)

Ad iii) In total, 10 NRAs dealt with sustainability derogations and the person days spent was between 8 and 427. The number of person days are to a large degree dependent on the number of applications. On average, NRAs spent about 28 person days per derogation.

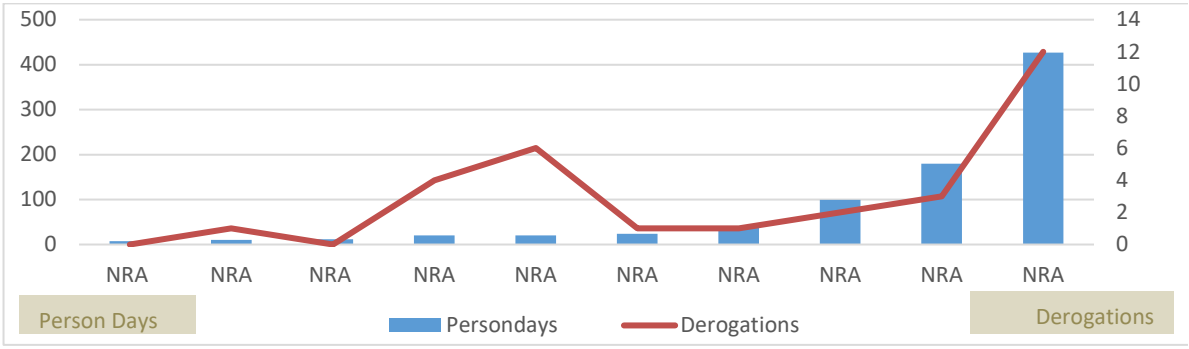

Figure 4: Person days spent per NRA in 2019 for examining sustainability derogations (answers from 10 NRAs included)[7]

[7] There are two NRAs that had efforts, but no derogations were in place at the time of drafting this report. This might mean that these NRAs had an application for sustainability derogation, but in the end no sustainability derogation came into effect.

2.2.2. BEREC's regulatory costs

The Agency for Support for BEREC (BEREC Office) provides administrative and professional support to BEREC. In previous years an average of 353 person days per year was dedicated to the Roaming WG support. In 2019, the Roaming WG held eight meetings which were attended by 132 experts and generated costs of about 38,000 EUR.

2.2.3. Analysis of MNOs regulatory costs

The analysis of the MNOs' data provided to the question regarding the effort (in person days) that were put during 2019 into reporting on the implementation of the roaming regulation (e.g. benchmarking report, on line survey, other administrative reports) shows the following picture (see Figure 5): In total, BEREC received 87 replies from MNOs. While 16 MNOs did not provide any data, 31 MNOs responded that they spend up to 20 person days per year, 26 MNOs up to 40 person days and 14 MNOs more than 40 person days (the maximum was 500 person days).

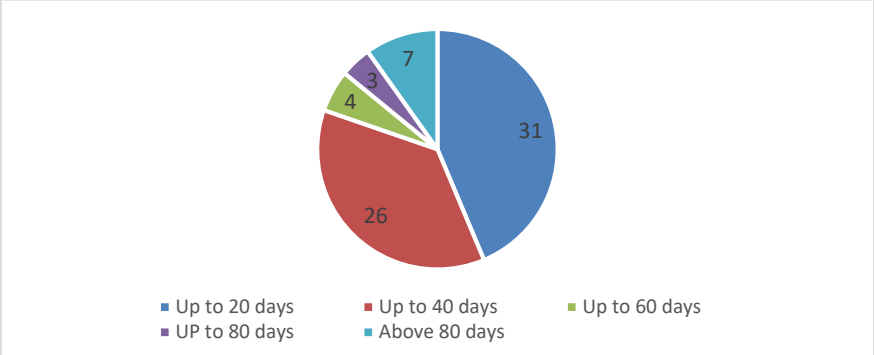

Figure 5: Person days spent per MNO during 2019 for reporting on the implementation of the roaming regulation (answers from 71 MNOs included)

With regard to the question regarding the cost of running (not implementing) the transparency obligations included in the Roaming Regulation the responses were far less than those to the question regarding the efforts for the implementation of the regulation (see Figure 6). From the 87 responses received only 31 MNOs provided data. The data provided various between 0 Euro and 1,000,000 Euro, so a quite heterogenous picture.

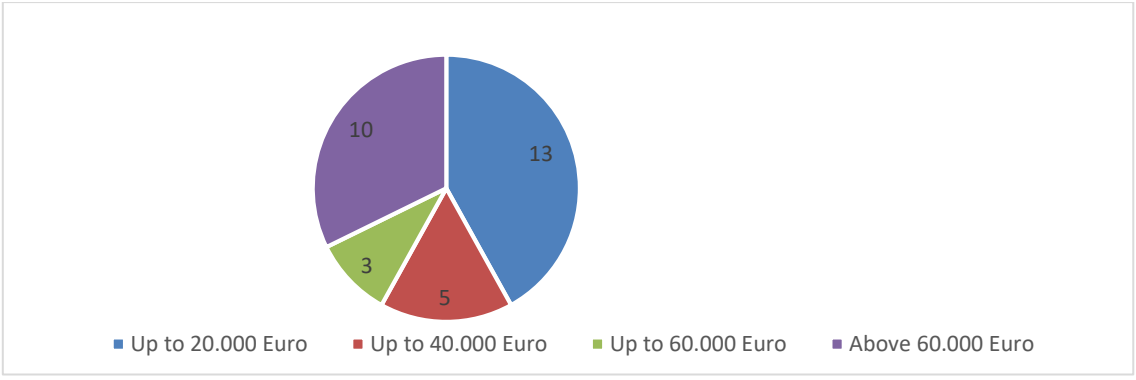

Figure 6: Estimate of the cost of running (not implementing) the transparency obligations per MNO (answers from 31 MNOs included)

From the question regarding an estimate of the effort that were put during 2019 for applying for sustainability derogations BEREC's analysis shows that out of the 14 MNOs that applied for sustainability derogations, 7 MNOs spent up to 20 person days, 2 MNOs up to 40 person days, 2 MNOs up to 60 person days and 3 MNOs more than 60 working days (see Figure 7).

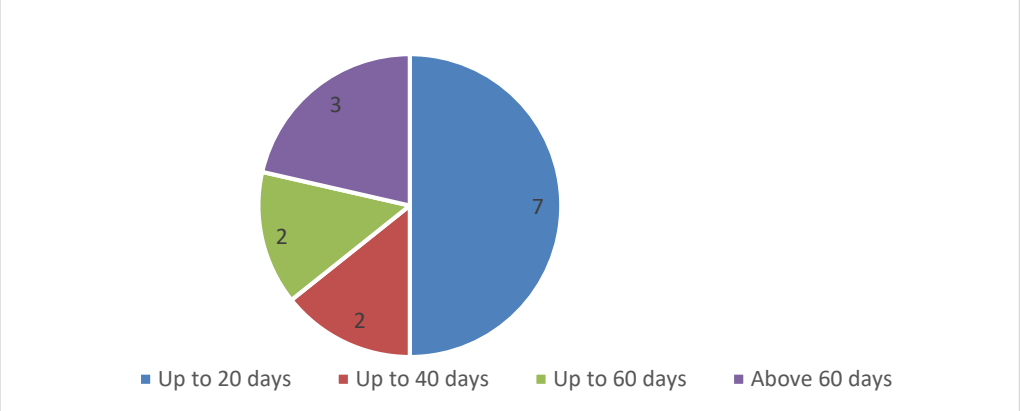

Figure 7: Estimate of the effort (in person days) that MNOs spent during 2019 for applying for sustainability derogations (answers from 14 MNOs included)

The MNOs were asked to provide an estimate of the effort that were put during 2019 for running (not implementing) the FUP provisions included in the Roaming Regulation. Out of the 87 answers BEREC received (38 did not reply), 18 MNOs reported that they need up to 20 person days, 14 MNOs need up to 40 person days, 3 MNOs up to 60 person days, and 14 MNOs more than 60 person days (the maximum is 1,000 person days). (see Figure 8).

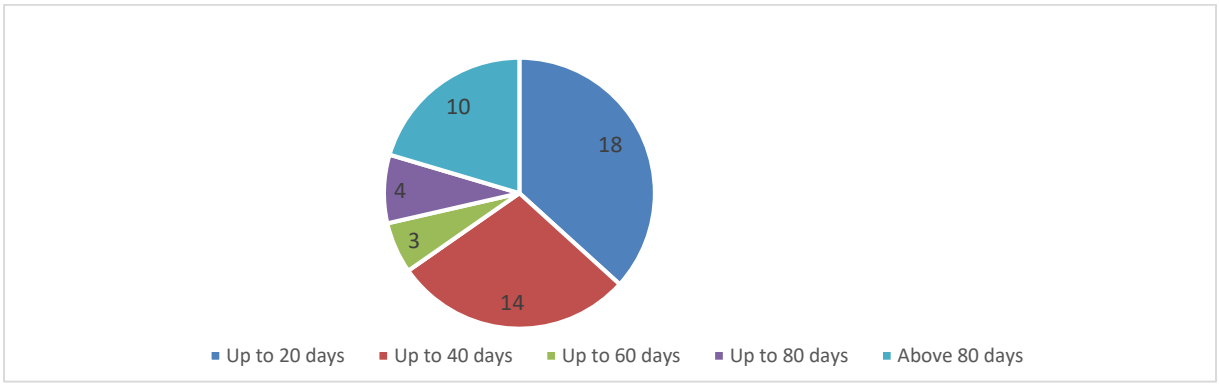

Figure 8: Estimate of the cost of running (not implementing) the transparency obligations per MNO (answers from 31 MNOs included)

2.2.4. Analysis of MVNOs' regulatory costs

The analysis of the MVNOs' data provided to the question regarding an estimate of the effort (in person days) that were put during 2019 into reporting on the implementation of the roaming regulation (e.g. benchmarking report, online survey, other administrative reports) shows that of the 106 MVNOs that participated in the joint EC/BEREC survey (35 MVNOs did not provide any data) 49 MVNOs reported that they need up to 20 person days, 15 MVNOs up to 40 days, four MVNOs up to 60 days and 3 MVNOs above 60 person days (up to the maximum of 100 person days) (see Figure 9).

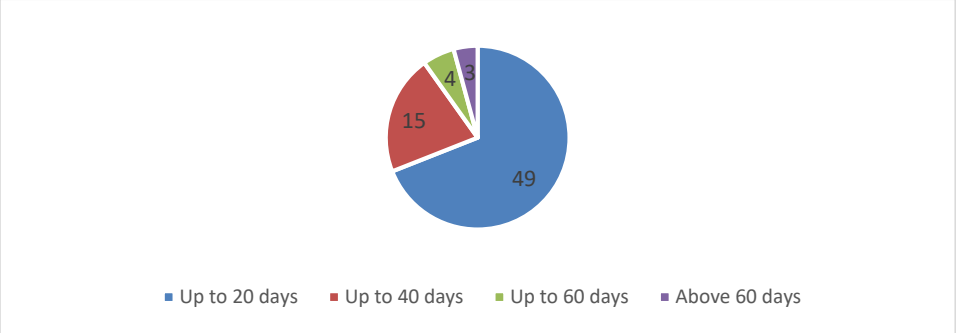

Figure 9: Person days that MVNOs put during 2019 for implementation of the roaming regulation (answers from 71 MVNOs included)

As regards the answers to the question on the estimate of the cost of running (not implementing) the transparency obligations included in the roaming regulation only 44 MVNOs out of 106 MVNOs provided an answer. The cost for these 44 MVNOs varies between 0 Euro and 500,000 Euro. 6 MVNOs report to have no costs, 20 MVNOs have up to 10,000 Euros, 7 MVNOs up to 20,000 Euros, 6 MVNOs up to 40,000 Euros and 5 MVNOs above 40,000 Euros (the maximum is 500,000 Euros) (see Figure 10).

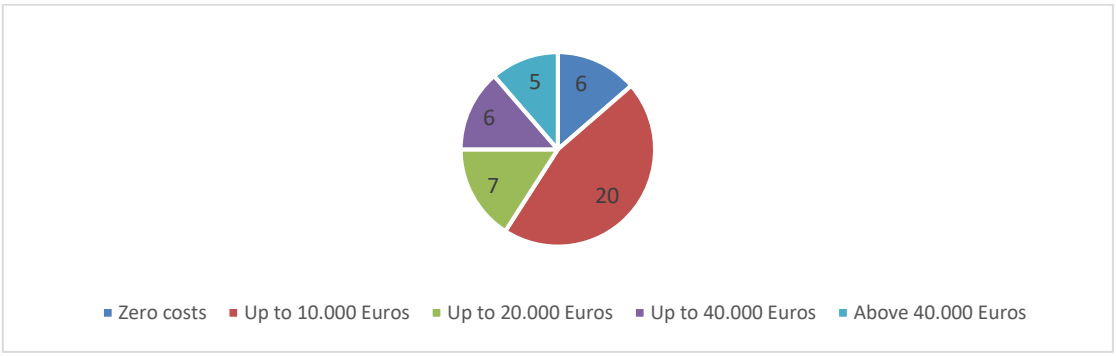

Figure 10: Estimate of MVNOs cost of running (not implementing) the transparency obligations included in the roaming regulation (answers from 44 MVNOs included)

As for the question regarding an estimate of the effort (in person days) that the MVNOs put during 2019 for applying for sustainability derogations the data shows that 24 MVNOs had a workload of up to 10 person days and 5 MVNOs reported a workload of more than 10 person days (up to the maximum of 30 working days) (see Figure 11).

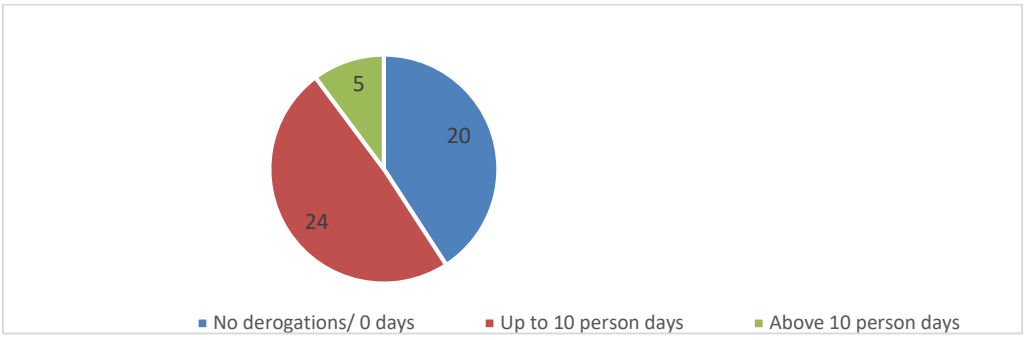

Figure 11: Estimate of person days spent during 2019 for applying for a sustainability derogation (answers from 49 MVNOs included)

The MVNOs were also asked to provide an estimate of the effort that they put during 2019 for running (not implementing) the FUP. Out of the 106 answers received (49 did not respond), 32 MVNOs put an effort of up to 20 person days, 7 MVNOs up to 40 person days, 15 MVNOs up to 60 person days and 3 MVNOs more than 60 person days (up to the maximum of 215 person days) (see Figure 12).

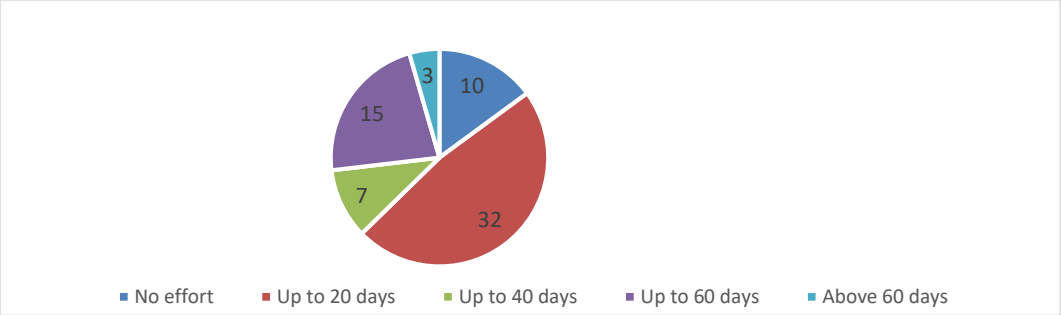

Figure 12: Person days spent per MVNO during 2019 for running (not implementing) the FUP provisions (answers from 67 MVNOs included)

2.3. Has BEREC identified room for improvement of the Regulation?

In addition to the measures proposed in the following chapters targeting the specific areas identified (e.g. VAS, QoS), as well as the recommendations already provided in the BEREC opinion, BEREC considers that these should also be addressed in the Roaming Regulation review:

- *Reduction of Regulatory burden*: The Roaming Regulation foresees a surcharge for incoming calls based on the weighted average MTRs. The value is laid down by the EC in an implementing act after receiving input from BEREC. This implementing regulation might not be necessary with the the single maximum mobile voice termination rate across Europe. The Roaming Regulation could refer to the Delegated Act on the single weighted average MTRs directly. If this is included, a BEREC input is no longer required.

- *Reduction of Regulatory burden*: In order to further reduce the regulatory burden for operators, NRAs and BEREC, BEREC proposes to remove the obligation to publish the yearly report on transparency and comparability of roaming tariffs. BEREC is of the view that the required parts of this report could be covered by the international roaming benchmark report and respective questionnaire.

- *Clarification of regulatory provisions*: With regard to Article 5 (1) of the Commission Implementing Regulation (CIR) BEREC identified some room for improvement and further specifying this provision. The article could mention details to be included in a notification and should also provide provisions about the timing.

- *Implementing act* (IA) *on structural measures*: The still applicable Implementing Act[8] on structural measures includes the Single-IMSI measure, even though this possibility was removed in the latest Roaming Regulation.

Apart from the above mentioned measures BEREC considers further measures necessary for better consumer protection:

- *Roaming in networks onboard ships and planes[9] that automatically connects users due to roaming agreements with the users' home networks*: The current Roaming Regulation does not cover roaming on such networks, which results in a number of complaints registered by NRAs about bill shocks. Therefore, BEREC recommends for any review of the regulation to extend the Regulation to cover these networks with regard to transparency measures. This will entail that as a means to avoid bill shock, operators would have to inform customers of the prices that apply once they are connected to networks onboard ships and planes, and to cut off the service when a specific financial limit is exceeded.

- *Cut-off limit*: The previous revision of the Roaming Regulation amended the provisions of the cut-off limit. While initially it was foreseen as an opt-out mechanism for customers, it is now an opt-in possibility. This leads to the situation that a significant number of customers not opted-in are therefore not protected and can be confronted with bill shocks. While this is not a relevant problem for roaming in the EEA due to RLAH, it is much more sensitive when roaming outside the EEA as prices are much higher.

- *Personalised pricing information*: BEREC recommends to amend the provision regarding the personalised pricing information in a way that, in addition to the price to be paid, any pontential fair use limits etc., customers should also be informed about whether a cut-off limit applies at all, and which one. This would be especially helpful for roaming outside the EEA or on networks onboard ships and planes. As the personalised pricing information included in the "welcome SMS" already contains a number of information, a free-of-charge landing page could be an alternative. In addition, with a view to prevent bill shock cases stemming from using certain operators' apps while roaming, BEREC recommends to adapt the transparency related tools covering also usage of apps.

[8] COMMISSION IMPLEMENTING REGULATION (EU) No 1203/2012 of 14 December 2012 on the separate sale of regulated retail roaming services within the Union

[9] https://ec.europa.eu/digital-single-market/en/mobile-phone-calls-permitted-during-flights

3. Quality of Service (QoS)

In its opinion, BEREC flagged the QoS when roaming as an issue to be addressed by the Roaming Regulation review. Current evidence does not give clear indications about the size of the problem (including the analysis provided in the most recent transparency and comparability report). Therefore, the EC is requesting the following information, in particular:

- *EC would welcome a further, more updated analysis, including:*
  - *An assessment of the size of the problem (e.g. based on latest survey results, number of complaints or any other evidence);*
  - *Indications on actions taken at national level to ensure QoS while roaming (preliminary analysis, monitoring, supervision, enforcement, informal procedures);*
  - *Identification of possible bottlenecks, at the level of the host operator (e.g. refusing to offer 4G access at wholesale level) or the home operator (e.g. seeking to restrict access to 3G at retail level);*
  - *Indication of the future possible use of BEREC net test as proposed in the BEREC opinion.*
- *EC would also welcome an updated analysis of possible measures, including their pros and cons, effectiveness and efficiency, possible impact on operators/end-users and especially monitoring and enforcement aspects.*
- *EC would also welcome an analysis of the potential impact of 5G on the quality of services while roaming and possible regulatory implications/needs.*
- *Would BEREC have any other comments or suggestions?*

3.1. Updated analysis QoS

3.1.1. Assessment of the size of the problem

BEREC already addressed QoS and roaming in the BEREC Report on Transparency and Comparability of International Roaming Tariffs[10]. The conclusion in this report was that 46 % of the operators report[11] to offer 3G roaming services in the EU/EEA even where 4G would be available and 61 % of those operators that only offer 3G services despite 4G being available are not planning to provide 4G roaming services by the end of 2019 or do not have any plans at all. In addition, BEREC is providing the results of the joint EC/BEREC survey, which are as follows.

Eight out 28 NRAs (29 %) reported to have registered complaints about QoS of roaming. All of them reported that these complaints (amongst other issues) pertained to data roaming. Three of these NRAs reported that the most frequent issue in these complaints was about the

[10] https://berec.europa.eu/eng/document_register/subject_matter/berec/reports/8901-7th-berec-report-on-transparency-and-comparability-of-international-roaming-tariffs

[11] The question addressed to operators did not specify that operators replying positively offer 3G across all roaming networks and all MS. Therefore, it is not clear if those operators responding with yes, apply this restriction to all countries and all networks.

speed (no 4G available or lower data speeds). Five NRAs reported that the most frequent complaints are not directly related to the lack of 4G or low data speeds but do refer to complaints about access to data services while roaming. One NRA reported an increasing number of complaints, two NRAs reported stable and five NRAs decreasing numbers.

Similar questions about QoS complaints were adressed to MNOs. 60 MNOs (69 %) reported[12]:

- to have received no complaints (everything zero) (25 %),
- not to be able to report the requested breakdown of the type of complaints (18 %),
- no number (including zero) in any of the complaints categories (21 %)
- only a total number under the category 'other' (5 %).

The questions were also addressed to MVNOs (106 in total). 55 of the MVNOs (52 %) reported:

- to have received no complaints (everything zero) (30 %),
- not to be able to report the requested breakdown of type of complaints (3 %),
- no number (including zero) in any of the complaints categories (10 %)
- only a total number under the category 'other' (9 %).

In order to have a clearer picture of general QoS problems during roaming the reported categories of complaints were cumulated. BEREC created three categories of complaints reported by the operators (37 MNOs and 51 MVNOs) and codified the relevant answers:

- Category I: complaints about lack of footprint/coverage (complaints regarding the selected roaming footprint of the home operator);
- Category II: complaints about only 2G, only 3G, no full 4G speeds available (no data to less speed than at home);
- Category III: complaints about voice quality, SMS and other (not data related).

These results are presented in Figure 13[13].

[12] To be able to analyse the submitted complaints in the prescribed categories relatively to each other the data that contains no useable input on QoS complaints has been singled out.

[13] For the sake of clarity, BEREC would like to point out that a very large part of the complaints regarding 4G speeds reported by MVNOs were reported by only two operators. These two MVNOs reported that they do not benefit from 4G access for roaming from their host operator. Furthermore, to be able to compare MNO and MVNO data on the complaints with NRA data, the answers had to be codified. NRAs only provided the total amount of complaints on QoS and the most occurring type of QoS complaint. BEREC therefore advise the reader to bare this in mind when examining the consumer complaints.

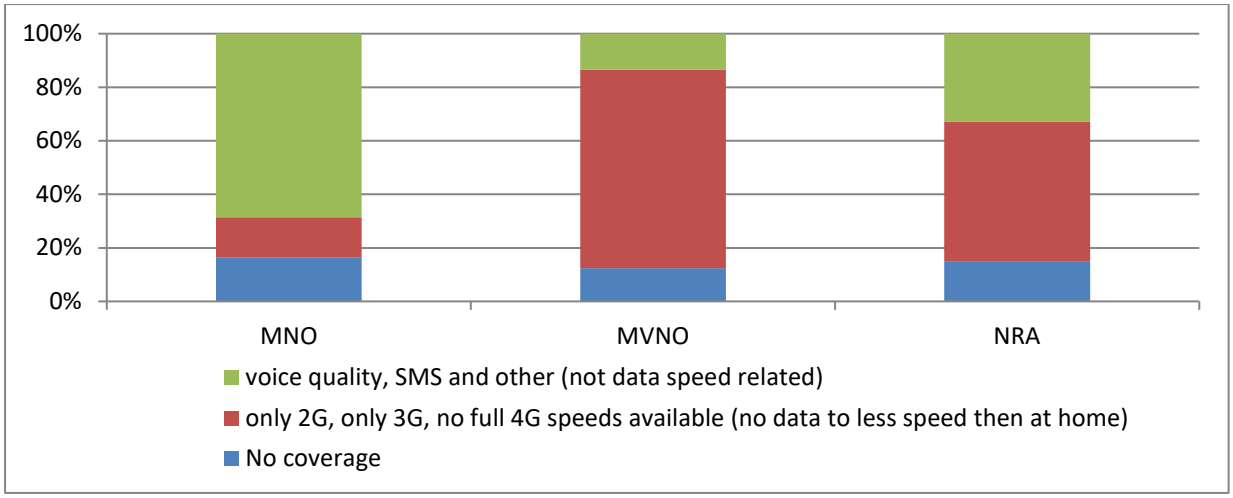

Figure 13: Percentage of complaints following the three categories for MNOs (37), MVNOs (51) and NRAs (8)

3.1.2. Actions taken at national level with regard to QoS while roaming

From the 28 NRAs in total, seven NRAs in fact started formal procedural steps to make operators compliant with the Roaming Regulation in general. None of these NRAs started formal procedural steps specifically related to improve QoS while roaming in the EU.

Among the NRAs that have not started formal procedural steps, four NRAs have taken actions against limitations of QoS during roaming. Three of those NRAs have reported to investigate if there are violations of the roaming rules by operators. Two NRA reported informal action, encouraging operators to ensure that they do not restrict the QoS while roaming, compared to the QoS available at home.

The QoS during roaming in a general understanding can contain a wide range of measurable indicators. Most of those indicators depend on the quality in the complete chain of the visited, transit and home network. However, some important indicators for QoS during roaming, which are also part of the main conditions of a domestic mobile service, can be set by the domestic operator. Conditions like for example the maximum speed of the network (or subscription) or the available access technologies of the network (or subscription) can be set by home operators according to the investigations performed by two of the NRAs.

In this regard BEREC would like to share the experience of two NRAs reporting to have taken informal action to encourage home operators not to restrict the QoS while roaming:

- The first NRA concludes that home networks can signal visited networks that their subscribers are not allowed to use higher speeds than a certain amount (which is lower than the maximum download speed at home). According to the mobile standards, the home operator can set specific roaming specifications for its customers when roaming abroad.

- The second NRA[14] has conducted an investigation regarding the lack of availability of 4G roaming access on visited networks. This research found that the home MNOs restrict mobile access for roaming services for specific countries or networks to 3G, while explicitly offering their subscribers 4G mobile access for national services. The research also found significant differences between MNOs in the number of EEA countries in which 4G mobile access for roaming services is offered. When offered, the home MNO typically has arranged 4G wholesale roaming access with (most of) their preferred visited networks[15], while for the other networks only 3G mobile access has been arranged. In addition, it was found that home MVNOs either offered the same 3G or 4G mobile access as their host MNO or did not come to an arrangement with their host MNO regarding 4G mobile access and therefore they were offering roaming on a 3G-only basis.

3.1.3. Possible bottlenecks

3.1.3.1. MNOs

According to the results of the MNO survey, there is no bottleneck in wholesale roaming pricing for direct roaming access, nor is there a price difference between 3G and 4G access in the Reference Offers.

A similar conclusion can be drawn regarding the potential bottleneck of QoS requirements in the reference offers. All MNOs report to have no specific requirements regarding QoS/data speeds in the reference offer. The general consensus of these reporting MNOs is that the reference offer is technology neutral and QoS of wholesale roaming services is the same as what the access provider is offering to its own customers. Only two MNOs report to limit their wholesale roaming access in their reference offer to 3G. BEREC would like to note that there are no operators/MNOs in the EEA without 4G access technology implemented in their network. Even if the amount of MNOs imposing this limit is marginal, BEREC does consider this behaviour as problematic.

The percentage of concluded inbound and outbound wholesale roaming contracts, where only 3G roaming access is being used, differs between MNOs. In case the percentage is zero the reasons given are typically that contracts are technology neutral. Therefore, 4G is available if access seekers request it and of course if the capacity is available. When there are wholesale contracts with only 3G, the reasons are summarised in categories such as no bilateral agreement, commercial reasons and simply that the access seeker has not made a request. One operator mentions to offer only 3G roaming access, but according to BEREC's investigation, this operator has 4G mobile access available for its own customers.

53 out of 87 MNOs (61 %) reported not having wholesale resale roaming contracts. From the other 34 MNOs that replied having resale agreements, 9 MNOs replied that they have technology neutral resale contracts. The other 24 operators, reported having 3G only

[14] https://www.acm.nl/en/publications/acm-telecom-providers-should-offer-roaming-abroad-under-same-terms-home

[15] Preferred visited networks are visited networks the customer gets steered to by the home operator.

wholesale resale contracts. The main reason why it is restricted to 3G, is that this was either their choice and/or capabilities of the MVNO.

At retail level, the majority of MNOs report not to limit the quality of the service/data speed of roaming services to 3G for their customers. However, BEREC is aware of 3 MNOs doing so for specific networks or for all visited networks. Two of them are MNOs from the country where the NRA has taken an informal action.

From the MNOs replies to the questionnaire, it seems that there is no technical or contractual (contracts between home and visited operator) bottleneck at the wholesale level. However, one of the aforementioned cases suggests that the actual bottleneck is due to home MNOs providing 4G roaming access at the retail level for only a part of their selected visited networks or for even none at all. The fact that MNOs do not provide 4G mobile access may result from the intention to limit wholesale roaming costs by limiting roaming data traffic, competition between groups of mobile operators in Europe[16] or generating a limited amount of roaming traffic on non-preferred visited network. However, these are views and cannot be verified by the responses to the questionnaire.

3.1.3.2. MVNOs

76 out of 106 MVNOs (72 %) report not to face limitations regarding the quality/speed of the services received from their host operators. 14 MVNOs (13 %) reported that roaming data service in certain countries and for certain networks is only available in 3G. 4 MVNOs (4 %) have access to only 3G data roaming in certain countries and 8 MVNOs (8 %) have only access to 3G data roaming. 4 MVNOs (4 %) did not provide any information regarding possible QoS limitations from their host operators.

89 MVNOs (84 %) reported that they do not face differentiated pricing regarding the type of quality of service/data speed of roaming services in the contract with the host operator, while 13 MVNOs (12 %) reported that they pay different wholesale prices for 3G and 4G services. Four MVNOs (4 %) did not provide any information.

83 MVNOs (78 %) reported not to have engaged in negotiations in order to obtain 4G where 4G was not part of the wholesale access already granted by their host operator. Eight MVNOs (8 %), who did engage in negotiations in order to obtain 4G access, mentioned that they encountered the following difficulties[17]:

- No problems regarding the negotiations, but the development of the technical project is significant (1 MVNO);
- Host operator delayed the process (1 MVNO);
- 4G services became available in January 2020 (1 MVNO);

[16] A group of operators in Europe might have an incentive to limit outbound roaming traffic directed to a competing group of operators in the EU.

[17] BEREC would like to note that with regard to the difficulties mentioned in the bullet points, the wording used is mainly based on the wording used by the operators themselves in their answer to the survey.

- Host operator did not grant access to 4G (2 MVNOs). One of the two further explained that its host operator refused to grant access to 4G roaming services because 4G roaming services were not covered by the Roaming Regulation;
- Expensive set-up fee (1 MVNO);
- In one country, the three domestic MNOs refused to give 4G access for the MVNOs business IoT services (1 MVNO);
- Problems regarding contact with the several operators in each country without the contact of roaming service provider with hub interconnection (1 MVNO).

Among the main reasons for not receiving 4G access from the host operator, the following reasons were mentioned by the MVNOs:

- Development needed on the MVNO side (10 MVNOs);
- Anti-competitive behavior of the host operators (1 MVNO);
- Failure of regulation (1 MVNO);
- Set-up fees (1 MVNO);
- Pure commercial difficulties (1 MVNO).

BEREC would like to note that according to the information submitted in the EC/BEREC joint survey, 4G roaming wholesale access was refused for3MVNOs by their host operator. Even though the number of MVNOs who reported these problems is not particularly high, BEREC considers this behaviour as problematic.

Regarding the price differences based on QoS/data speed of wholesale roaming services received from the visited operator, 103 MVNOs (97 %) did not face such differences. Two MVNOs (2 %) stated that they pay different prices for 3G and 4G access, depending on the visited country or the host network. One MVNO stated that it pays a different price for 3G and 4G access, independently of the visited country and the host network.

At retail level, 103 MVNOs (97 %) described that they do not limit the QoS, or data speed to 3G for their roaming customers. Three MVNOs (3 %) reported that they apply such limitations. When requested to provide more information regarding these limitations, these three MVNOs gave the following details:

- One MVNO reported that the limitations are applicable depending on certain visited countries or host networks.
- One MVNO reported that it did not implement 4G in roaming because of the high costs of roaming data – customers tend to use more data when the speed is higher.
- One MVNO stated that the limitations were justified as it believed that offering only 3G to roaming customers was in line with the regulation[18].

[18] However, the situation changed in February 2020, since this MVNO is now offering 4G in roaming. BEREC notes that this MVNO is from the country where the NRA has done an investigation.

From the MVNOs' replies, it seems that there is no technical bottleneck at the wholesale level for MVNOs to offer the same conditions as at home while roaming in the EEA[19].

In addition to the information provided above, BEREC is of the opinion that a potential bottleneck could be present in practice and this should be taken into account also in the light of future 5G deployments. Indeed, one of the aforementioned cases suggests that the actual bottleneck is because MVNOs do not come to an arrangement as to 4G roaming access with their host or roaming hub. In cases where a MVNO does offer 4G roaming services the service is limited by the arranged access technology of the selected visited networks in the roaming footprint of the host or hub. The fact that MVNOs did not come to an arrangement for 4G access may result from MVNOs wishing to limit wholesale roaming costs by limiting roaming data traffic for sustainability purposes.

3.1.3.3. BEREC's net neutrality tool

Since early 2020, the software and source code for the BEREC net neutrality tool is publicly available but currently not (yet) implemented in any MS[20]. Any future deployment of the tool will be at the discretion of each NRA .It will remain optional for NRAs to implement it. However, BEREC would like to note that this tool is not intended to be suitable for determining violations of the regulation, neither for neutrality and certainly nor for the roaming regulation. The principal reason for this is that the focus of the net neutrality tool is to measure the upload/download speed provided to the end user (against a specific server) and does execute some tests related to the Open Internet regulation related tests (e.g. port blocking and DNS manipulation). It has not been developed with the purpose of measuring QoS during roaming in the EU. Furthermore, it should be noted that upload/download speed measurements made with the use of any tool will be affected by many factors aside from the actual QoS, which the tool cannot directly measure in itself but are relevant to determine whether a violation is taking place. Therefore, this tool would have severe limitations if it were used for that purpose. This is particularly true for roaming users executing speed tests as in roaming situations, the results are affected by the performance of both the visited network provider and the home provider as well as the GRX transit network between them.

Individual measurements made while roaming cannot distinguish between normal network performance fluctuations and deliberate limitations (e.g. by either the home or visited network operator). Even if the tool is considered to identify the limitations described above, , one has to keep in mind that the need for a statistically valid number of equivalent measurements on the same combination of home/visited network would be needed in order to get sufficient data to be able to draw conclusions. Therefore, BEREC concludes that the BEREC net neutrality tool, in the current setup, is of very limited use for measuring QoS during roaming in the EU.

[19] BEREC would like to note that ten MVNOs reported the need to develop in their systems to enable 4G roaming. BEREC was not able to confirm this due to confidentially of the names of respondents, if in these cases those MVNOs actually are domestically offering 4G mobile services. If they domestically only offer 3G they do not have to offer 4G roaming services and therefore these cases should not be considered as proof of a technical bottleneck.

[20] Similar tools are in use by some NRA's (e.g. Nkom NetFart, AKOSTest, RTR-NetTest).

3.2. Analysis of possible measures

The EC asked BEREC to analyse possible measures including their pros and cons, effectiveness and efficiency, possible impact on operators/end-users and especially the monitoring and enforcement aspects. The EC did not propose any potential measures to BEREC. This section presents BEREC's views regarding potential QoS measures.

3.2.1. Retail measure

BEREC is of the opinion that the Roaming Regulation must make clear that conditions of the domestic offer must not be altered by the home operator during roaming. This means that end-users should be able to benefit, while roaming, of all the available conditions offered at home, for example also the same mobile access technology.

3.2.1.1. Effectiveness and efficiency of retail measure

Some operators might be tempted to lower maximum speeds for roaming in order to limit or prevent the usage of certain high bandwidth demanding end-user services, such as HD video (live) streaming. A concrete example is the case where a customer has a maximum data speed of 100 Mbps at home and the home operator requests the visited operator to give the end-user a limited maximum data speed of 50 Mbps while roaming, although there is no restriction by the visited network (which in this example is offering speed of 80 Mbps). The customer in this scenario gets less than at home and is discriminated in this roaming scenario. The proposed retail measure would tackle this issue, as it would ensure roaming customers to use their mobile services in the similar way as at home (or at least at the maximum available speed in case it is lower).

The proposal at wholesale level, referred to in Chapter 3.2.2, would also encourage the retail measures proposed above.

3.2.1.2. Impact of amending the retail measures of the regulation

The impact on the operators depends in particular on three factors:

First, it depends on the number of selected visited networks for which MNOs have already arranged 4G access. If 4G roaming access still needs to be arranged in a high number of their selected visited networks, then the impact would be high (many negotiations/implementations for MNOs in the EEA).

Second factor is that roaming data volumes may increase significantly. This is especially crucial for those MNOs and MVNOs, which currently only offer 3G data roaming, and for operators, which face high wholesale roaming data unit prices. In some cases an MNO or MVNO might even consider to apply for a derogation to apply surcharges.[21] In order to prevent competitive distortions BEREC invites the EC to assess the wholesale part of the Roaming

[21] In the aforementioned cases where NRAs did an investigation to improve QoS, one of the MVNOs after arranging 4G data roaming announced to submit an application for a derogation.

Regulation, while comprising the need of full recovering the wholesale costs so as to enable all operators, in particular small operators, to offer the same QoS as at home in a sustainable way. BEREC therefore refers to the proposed measures at wholesale level to improve the sustainability for MVNOs (chapter 5).

A third factor is that due to more wholesale negotiations the need for dispute settlement resolutions may increase if the wholesale roaming regulation is not amended accordingly.

3.2.1.3. Monitoring and supervision effects of the proposed amendments in the retail part of the regulation

As mentioned above, BEREC's net neutrality tool is not suitable to prove limitations in QoS during roaming in the EEA. Therefore, administrative investigations are always necessary. According to Article 16 (4) of the Roaming Regulation, NRA's have the right to request from operators any information that is necessary to assess the application of the regulation. The NRAs would therefore have the power to request information about which visited networks have been contracted, what access technologies are enabled, which of the visited networks are the preferred networks and the amount of the total roaming volume of the home operator in an EEA-country goes through each selected visited network. Furthermore, to prove active limitation of the maximum speed during roaming by the home operator, NRAs can request information from home operator systems.

3.2.2. Wholesale measure

BEREC is of the opinion that the wholesale roaming regulation should be amended in such a way that a request for access to mobile technologies that an MNO offers to its own customers and which are technically available, should be considered as a default technology to qualify as a reasonable request. The access to all of the available technologies is necessary for the provision of regulated roaming services with similar QoS roaming conditions as at home.

3.2.2.1. Effectiveness and efficiency of wholesale measure

Such an amendment would be effective in order to reduce the amount of disputes and to ensure the effectiveness of the retail amendment. However, it may not be sufficient in the case where an MNO claims to have a limited capacity for such access and uses this reason as an objective criteria to refuse such a request from an access seeker. In such a case, a dispute might still need to be settled.

3.2.2.2. Impact of amending the wholesale measures of the regulation

BEREC considers the impact on MNOs as small since contracts and Reference Offers are mostly already technological neutral. A small positive impact might result from non-preferred visited networks receiving an increasing roaming volume when 4G roaming is implemented on their networks as well.

3.2.2.3. Monitoring and supervision effects from amending the wholesale measures of the regulation

The compliance with the Roaming Regulation is mostly monitored based on complaints and disputes. BEREC did experience one such case.[22]. That case pertained to a dispute about suspected arbitrage by permanent roaming. It is not expected that amending the wholesale regulation will have an effect on the current monitoring and supervision activities by NRAs regarding wholesale obligations.

3.3. Impact of 5G on QoS while roaming and possible regulatory implications/needs

23 out of 87 MNOs (26 %) reported explicitly not to have intentions to add 5G access technology to their wholesale roaming access in their Reference Offer at the time of responding to the questionnaire. They mentioned many different reasons ranging from that there is no inbound roaming implemented for that access technology to that there are no plans to implement 5G yet.

BEREC expects limiting the conditions for domestic services such as the available access and maximum data speed by home operators to remain possible with 5G mobile access technology.

Therefore, with regard to the upcoming availability of 5G mobile access technology BEREC asks the EC to consider amending Article 3 of the Roaming Regulation with a technology neutral approach as also proposed in para 3.2.2

3.4. Conclusions BEREC on QoS

BEREC concludes from the complaints received by operators and NRAs that QoS in roaming scenarios is an issue for some end-users. BEREC has no reason to consider that this issue will not stay when 5G technology is deployed.

Considering the experience of some NRAs and the collected data in the joint EC/BEREC survey, BEREC recommends amending the regulation, in order to ensure that all end-users can experience RLAH with similar QoS conditions like at home (under the available conditions of the visited network).[23]

At the retail level, the regulation should make clear that the conditions of the services provided must not be altered by the home operator during roaming.

[22] https://berec.europa.eu/eng/document_register/subject_matter/berec/opinions/8133-berec-opinion-on-bnetza-request-on-providing-wholesale-roaming-access

[23] Limitation of data roaming speeds by home operators might lead to not being able to use high bandwidth demanding services while roaming like streaming a live football match, even when there is good coverage on the visited network.

At the wholesale level, the regulation should ensure that a request for access to mobile technologies that are offered by the MNO to their own customers and which are technically available from the visited network, should be considered as a default to qualify a reasonable request.

These amendments have the purpose to tackle the above-mentioned issues regarding the behaviour of home and/or visited operators.

Finally, BEREC also notes that Article 3 of the Roaming Regulation and the wholesale caps should be consistent with any QoS requirements that might be introduced in the regulation in order to allow operators, and especially smaller ones, to comply with the QoS requirements in a sustainable way. Therefore, BEREC asks the EC to take account of the proposed measures for improving the sustainability of MVNOs.

4. Value Added Services

The following questions were addressed to BEREC regarding VAS:

- *We would welcome an analysis, further elaborating on the proposed measure to publish a European database with number ranges with high termination rates (VAS, premium rate numbers etc.). The discussion could address different implementation options (static list vs. database) and their costs, frequency and modality of updates, technical feasibility as well as pros and cons, effectiveness and efficiency.*
- *We would welcome BEREC's views, including on the technical feasibility, pros and cons, effectiveness and efficiency of transparency measures on wholesale rates applicable on VAS.*
- *We would welcome BEREC's views, including on the technical feasibility, pros and cons, effectiveness and efficiency of any transparency measures at the retail level.*
- *Would BEREC consider any other measures (at retail or wholesale level)? What would be the pros and cons, effectiveness and efficiency, cost of implementation, possible impact of such measures?*

The following subchapters are providing answers to the aforementioned four questions.

VAS are neither legally defined in the current European legislation framework nor consistent and differ in almost all MS in terms of definition, numbering, services offered and prices. For the purpose of this document in the context of roaming, BEREC, following the ITU-T recommendation[24], thinks of VAS as services that are offered in addition to or in conjunction with basic telecommunication services such as voice call or short message service (SMS).Therefore, in view of simplification, BEREC tried to cluster for the scope of this analysis the most common VAS for a common understanding. In this respect, for the assessment of VAS in this opinion, BEREC is using the following terminology[25] to describe various categories:

a) Premium-rate numbers used for calls where certain services are provided, and for which the prices are higher than normal calls. Unlike a normal call, part of the total call charge is usually paid to the premium rate service provider, generally a distinct entity from the ECS provider, thus enabling businesses to be funded via the calls.

b) "Freephone" numbers (e.g. 0800), which are free of any charge to domestic consumer, e.g. a bank hotline, travel agency hotline, insurance helpline etc.

c) Universal international Freephone numbers, UIFN (00800), where according to ITU-T recommendation D.115 the charges for all calls to this number are paid by the respective subscriber instead of the originating caller.

d) "Shared cost" numbers for which a domestic consumer pays only the charge for a local phone call. The called party pays the other part. E.g. e-shops etc.

e) 116 xxx, which is an EEA harmonised number range[26].

[24] https://www.itu.int/ITU-T/recommendations/rec.aspx?rec=13368&lang=en
[25] Numbers used for emergency services, like 112, are not considered under this chapter.
[26] https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32009D0884&from=EN

f) Special phone numbers, which do not fall into category a-e, but are charged more than a regular communications service (e.g. 11 8 XY in some MS used for directory services).

BEREC published its findings especially with a view to the lack of transparency for roaming calls to VAS in its opinion on the functioning of the roaming market as input to the EC evaluation in June 2019. The findings have been confirmed by the joint EU/BEREC survey in April 2020. In addition to the survey, BEREC has conducted a survey among its members also in 2020 to gain a broader picture of VAS in roaming scenarios. This survey included questions about the number of consumer complaints related to VAS while roaming as well as a first assessment of potential measures to tackle issues identified both on the wholesale and retail level.

First of all BEREC points out that the lack of transparency and high surcharges for VAS are not only related to roaming but also to national circumstances. The effects of intransparency is however often reinforced and complicated in roaming scenarios. BEREC therefore believes that issues concerning VAS in roaming scenarios have to be assessed in a larger scale, especially in the context of the EECC. From BEREC's view, the provisions concerning access to services and termination rates must be taken into account in the evaluation of the regulatory treatment of VAS in roaming scenarios. Some MS have also imposed national legislation, which goes beyond the provisions of the Universal Service Directive to further strengthen end-user rights[27]. These provisions could be examples for further improved consumer protection.

The root cause for the problems identified in roaming scenarios cannot be solved solely by provisions laid down in the Roaming Regulation. However, BEREC believes that some measures could be considered in order to mitigate the problems in roaming situations.

BEREC also points out that the analysis and the conclusions regarding VAS in roaming scenarios can also be seen in light of the intra-EU communications provisions laid down in Article 5a TSM Regulation. Although intra-EU communications are originated from the home MS of a consumer, due to cross boarder connections a need for a broader assessment can be seen similar to VAS in roaming scenarios.

4.1. Background

In April 2020, 30 % of the responding MNOs (25 MNOs) and 19 % of responding MVNOs (20 MVNOs) reported that they have received complaints from retail customers regarding VAS while roaming in the EEA. Most of the complaints received by MNOs are related to higher charges than at home or higher charges than expected, and often also refer to the lack of transparency. According to some responses, the large numbers of VAS ranges and various prices within EEA, seem to make it impossible to provide transparency or communicate retail prices for customers that are roaming. Half of the MNOs that have received complaints (12

[27] E.g. The Netherlands: National regulation calling customer helpdesk, hotline or customer service function must be at maximum local rate or from bundle. Norway has imposed price caps for certain VAS numbers, both at the wholesale and retail level. Termination rates should not exceed regulated MTRs and retail prices should be at maximum local rate or deducted from bundle. Germany introduced price caps and cut off limit per minute and per call. There is also national legislation in Portugal that sets maximum retail price at domestic level.

MNOs) also report that those are related to numbers for VAS that are blocked while roaming. Such complaints are also the most common reason for complaints according to the responding MVNOs (85 % of complaints related to VAS while roaming is due to blocked numbers). Many of the operators do however clarify that the number of complaints are very low or insignificant and they are solved on a case-by-case basis. However, even though operators in some of the cases waive the retail charge, this results in degrading the customer experience.

Regarding unexpected high wholesale costs, around 32 % of the MNOs (26) report that they have had such experiences. They explain that VAS are excluded from wholesale contract negotiations and that the visited operator decides whether to block access to premium services or to impose additional charges for such services. Further, it sometimes happens that VAS are provided in the same numbering range like regular/personal mobile or fixed communication. This will often imply that the call is charged with the basic domestic rate at retail level, while the wholesale charge turns out to be higher than expected, resulting in a negative margin.

Among the responding MVNOs, 12 % (13 MVNOs) have experienced unexpected high wholesale costs. Most of them (10 MVNOs) relate this to misuse by some of the SIM cards and limitations on prepaid billing.

Some of the MNOs and at least one NRA also highlighted that such situations might also result in structural fraud set up and artificial traffic to VAS. One operator estimated that abusive traffic to high cost destinations such as VAS generated 30,000 Euros additional cost per week for them.

Among the MNOs that have received complaints on calls to VAS while roaming, 68 % (17 MNOs) report to have a stable or oscillating volume of such cases. A few say it has either been increasing (6 MNOs) or decreasing (4 MNOs).

According to the survey, 7 MNOs have reported the situation to their NRA, BEREC and/or EC (previous surveys) without any result.

Information from NRAs also indicates that the number of complaints related to VAS while roaming are low since RLAH entered into force. 26 NRAs have provided information on the complaints related to VAS while roaming. Eleven NRAs report that they have not received any complaints in this area since 2017. Among this group of NRAs one says that it is not possible to call VAS provided in its country from abroad and another NRA explains that VAS numbers are not in use (except directory service) in its country. Among the NRAs that received complaints the number varies from 1 to 45 over the last three years. The figure below shows the number of complaints received by the responding NRAs.

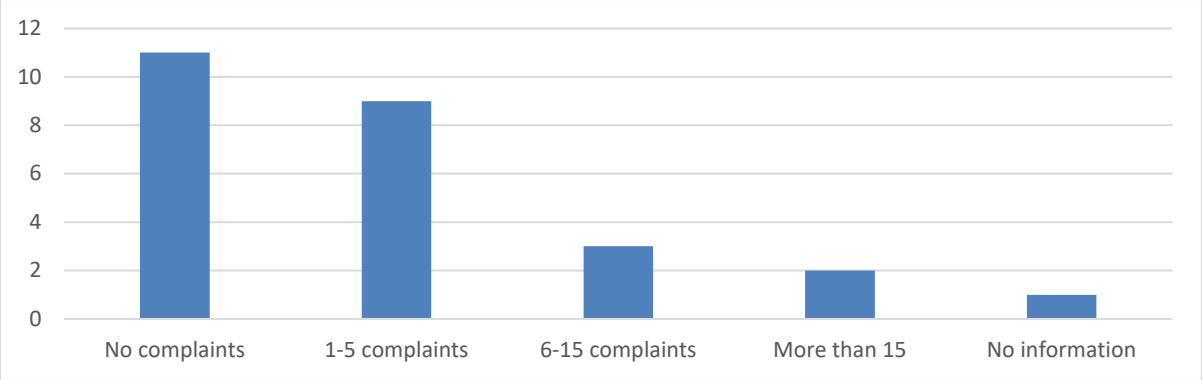

Figure 14: Number of NRAs as regards complaints received by them on VAS while roaming

One should note, that this might not give a complete picture of the total number of complaints, since in some countries, other bodies than the NRA (e.g. consumer protection associations) may also receive customer complaints. It is BEREC's opinion that the low number of complaints might be the result of a situation where over time customers have gotten used to the fact that calls to such services can be more expensive than regulars calls, as it happens in home countries and thus should be avoided, especially when roaming, in order not to risk bill shocks. Another reason BEREC identified could be that calls to VAS, when roaming, are blocked, so that such customers could not use VAS when travelling within the EEA. Since complaints according to the respondents of the survey are inter alia solved on a case-by-case basis, where operators sometimes waive the charges, it can be assumed that other customers that have not complained end up paying very high bills for calls to VAS while roaming.

Even if the magnitude of the problem is not very large, there are also examples of bill shocks and consumer complaints regarding calls to VAS with high importance for the user. It remains to be seen whether there will be a peak due to the spread of the pandemic since the beginning of 2020, because after the first measures (e.g. closing borders across the EEA) have been taken, for instance, customers had to reorganize their travels back home (e.g. by calling shared cost airline hotlines) and tried to get more information about the pandemic and the corresponding measures from medical hotlines in the visited country (e.g. calling 116 117 in the visited country).

Some NRAs have information on the type of VAS that have most frequently been subject to complaints since RLAH entered into force in June 2017. According to the responding NRAs, most of the complaints are related to Premium Rate Services (PRS) and national Freephone numbers. Especially national Freephone numbers are also mentioned as the most frequent source for complaints by the operators.

4.2. Legal basis for regulatory measures on EU level

A regulated roaming call according to Article 2 (2) h) of the Roaming Regulation in is defined as "*a mobile voice telephony call made by a roaming customer, originating on a visited network and terminating on a public communications network within the Union or received by a roaming customer, originating on a public communications network within the Union terminating on a visited network".*

The definition of regulated roaming call seems to be quite general and is purely referring to calls from a visited network to another network without mentioning any numbering resources. Article 2 (2) j defines "SMS message" as a text message capable of being sent between mobile and/or fixed numbers assigned in accordance with national numbering plans. The definition for regulated roaming SMS message in Article 2 (2) k) refers to the definition of Article 2 (2) j. In addition, VAS are not excluded from these definitions. Therefore, BEREC understands that communications to VAS can be seen as regulated roaming services. Nevertheless, the Roaming Regulation refers to VAS in recital 43 in Regulation 531/2012 with the following text: *"This regulatory approach [safeguard caps] should not apply to the part of the tariff that is charged for the provision of value-added services but only to the tariffs for the connection to such services."* However, BEREC understands that recital 43 refers to PRS and not to other types of VAS.[28]

In practice, the charges for calls to VAS are not always split into charges for the added service and the charges for the connection. In fact, customers can also be charged wholly on a time basis (e.g. per minute), per call/SMS (e.g. in case of some shared cost numbers) or a combination of both. A per call billing mechanism at home will on the one hand protect the customer against high charges while they are on hold calling hotlines, and on the other hand make especially wholesale agreements and charging on wholesale level even more complex. Lastly, in some countries, wholesale prices charged to VAS are not regulated and the charging mechanism is different from the termination rate. In fact, what is charged is an origination rate, which is not regulated. In most wholesale agreements charges are negotiated on a time-based billing (e.g. per second or per minute) while the retail charges can be billed on a per call/SMS basis or a combination of both. This results in operators having to pay wholesale charges for the whole duration of a customer's call bearing a high risk of losses.

As indicated already in the background chapter, VAS in roaming scenarios is covered by a wide range of legislation. It is especially worth mentioning that some respondents have stated that blocking VAS may be an adequate measure to prevent unexpected high (wholesale) charges. Currently, Article 28 of the Universal Service Directive (USD) requires the MS to ensure that end-users from other MS are able to access VAS numbers within their territory where technically and economically feasible. The EECC incorporates the access to numbers and services in Article 97 requiring MS to ensure that, where economically feasible, end-users can access and use services using non-geographic numbers within the Union. End-users must have access to all numbers in the Union including those set out in the national numbering plans of MS and Universal International Freephone Numbers (UIFN). In this context Article 97 of the EECC provides the possibility for NRAs or Other Competent Authorities (OCAs) to require providers of public Electronic Communications Networks (ECN) or publicly available Electronic Communications Services (ECS) to block access to numbers on a case-by-case basis where this is justified by reasons of fraud and misuse.

BEREC is of the view that in general access to all types of VAS should be possible and unjustified blocking is not in line with the legislation in force. This means that blocking of

[28] See also BEREC Retail Roaming Guidelines, Guideline No. 185, available at: https://berec.europa.eu/eng/document_register/subject_matter/berec/regulatory_best_practices/guidelines/7005-berec-guidelines-on-regulation-eu-no-5312012-as-amended-by-regulation-eu-no-21202015-excluding-articles-3-4-and-5-on-wholesale-access-and-separate-sale-of-services

services by ECN and/or ECS providers can only be justified on grounds of economic feasibility and/or can be imposed by NRAs or OCAs only in cases on the basis of reasons of fraud or misuse.

4.3. Assessment of transparency measures and other measures

4.3.1. European database for VAS numbering ranges

In the online survey respondents suggested a centralised database for PRS or for VAS in general.

BEREC started a project in 2020 with the objective to identifying and listing all voice-based PRS and directory enquiry services number ranges on the allocation level in all MS. The database will not include information on assignees of numbering ranges nor tariff information, as including assignments would be much more time consuming and needs constant updating. In the course of the project, it became apparent quite quickly that PRS numbers are very heterogeneous. At the wholesale level, transparency of charges is almost not available. This is partly because the commercially negotiated charges are business secrets and partly because the prices are not even available before a connection to PRS is established. The main reason for this, according to the operators, seems to be that number ranges for VAS vary between countries and are not always comunicated in a transparant way between roaming partners. VAS services can even be provided in the same numbering ranges like ordinary/personal mobile or fixed number ranges. Because of this, traffic to VAS can not always be separated from regular traffic. In addition, VAS charges at the wholesale level are mostly not negotiated in detail. Only after the connection is established, the charges are billed and passed on to the customers by roaming providers. Due to that fact, the retail prices vary widely, which makes detailed information on prices difficult.

BEREC's list of voice-based PRS including directory enquiry number ranges will soon be completed and it will provide useful information for operators to be able to identify number ranges for voice-based PRS including directory enquiry services. It could be extended to also cover other types of VAS. Some operators claim that they have failed to obtain such information themselves (difficult to get replies from operators or replies are not consistent). However, the objective of such an extended database should be considered, because the way the information is presented to the users is important (e.g. the information would have to be quite different for consumers than for service providers). The current format of BEREC's list is intended for operators and it is not intended for or suitable for consumers.

The main advantages are:

- First step to identify higher termination rates (TRs)
- Depending on the details included quite easy to establish a database
- NRAs supporting such a database as a first step for more transparency on wholesale level

A centralised European database with a more detailed level of information (assignment level and pricing information) would require much more resources to administrate and keep database up-to-date. As in some MS databases concerning VAS rates[29] are already being operated by third parties, such solutions could be explored. The existing VAS databases would give the opportunity to create a centralized database, using the existing data. Although the data collection would be rather simple, the verification of collected data would require an additional effort. This applies in particular to information supplyied by databases which are not operated by public bodies like NRAs or OCAs. However, the amount of resources would possibly not outweigh the benefits for operators or customers. Due to the lack of a legal basis, establishing a database for VAS leads to the question who should operate it and collects or verifies the data. Therefore, the authorisation to intervene has to be ensured, as well as to enforce the data provision and to validate the data included.

Nevertheless, BEREC is of the view that it is worth to consider a database that includes information on numbering ranges for VAS (in addition to PRS) or numbering ranges with high (unregulated) termination rates as a first step towards more transparency at wholesale level and potentially at retail level. Depending on the details included in such a database it can be created with some effort. Developing a dynamic database, including more details like charges at the wholesale level, exact numbers of VAS as well as existing (legacy) numbers already in use for conventional mobile or fixed communications and the retail level would increase the additional effort significantly.[30] A precise cost benefit analysis would be necessary.

4.3.2. Other transparency measures for VAS at wholesale level

4.3.2.1. Harmonising VAS number ranges

Some operators have proposed to introduce dedicated and predefined number ranges for VAS based on harmonised EU rules. This solution would provide total transparency for operators. As stated by some operators and NRAs within their answers to the surveys, a standard VAS range would be a suitable approach with a view to clear and reliable regulations both for operators and customers. A standard VAS range would protect operators and customers from paying unexpected (wholesale) charges due to the fact that the VAS could be identified immediately after a customer initiates a call or SMS. This measure could enable further transparency measures.

However, BEREC identified some major drawbacks with regard to harmonizing numbering ranges for VAS. Given the current situation and the large differences in MS with regard to VAS numbering ranges, there would be a susbstantial need for negotiating and coordinating for standard ranges. It can be assumed that such a coordination would take several years to harmonise the numbering ranges between the countries and subsequently would require further considerable effort for the implementation. Finally, it would be extremely challenging to move services from one number range to another. Therefore, BEREC is of the view that

[29] E.g. see https://coin.nl/en/services/routeer-tariefinformatie

[30] In order to facilitate matters from both transparency and technical perspectives, ideally VAS numbers are only allocated from number ranges which are dedicated specifically for VAS and not from conventional mobile or fixed number ranges.

although harmonising VAS number ranges seems to be an effective measure, the cost benefit ratio and national sovereignty of numbering plans need to be very carefully considered as most probably the enormous financial and administrative burden would outweigh the benefits. With regard to harmonising VAS ranges, BEREC would like to refer to the experencies gained in the attempt to introduce an European Telephony Numbering Space (ETNS). The work started in 2001 and was terminated without any results in 2010.

4.3.2.2. Obliging operators to publish wholesale charges for VAS

An obligation for operators to publish wholesale charges for VAS would certainly require a legal basis separate from the Roaming Regulation. However, publishing reference offers for VAS would increase transparency and subsequently improve efficiency in negotiations at the wholesale level. Bilateral agreements could result in charges different from the ones set out in the reference offers but those would provide the maximum limit of wholesale charges that can be expected.

4.3.3. Transparency measures for VAS at retail level

4.3.3.1. Warning customers

Providing the exact tariff information for all VAS services for roaming customers seems to be extremely challenging. To this end, customers could in general be warned about high tariffs for calling various types of VAS when roaming and, be encouraged to seek more information before calling such numbers while roaming (if the information is available). Information that is sufficent and meaningful should help ensuring that customers would be in a position where they can actively choose to making a call to VAS numbering or not. Such warnings could either be given by voice alert (in the language of the home operator), included in the “Welcome SMS”, published on the website, provided by the call center, or via applications.

4.3.3.2. Voice alert

A helpful measure for customers could be via a voice alert when the customer is actually initiating a call to VAS. Such a voice alert requires that operators are able to identify VAS. In this case, an additional customer protection mechanism could be implemented. Before establishing a connection, i.e. before the connection is charged, customers receiving the pricing information would be put in a position to actively confirm whether they wish to continue the call e.g. by pressing a key on the mobile device. However, it seems that such a voice alert solution may be costly and technically challenging due to the current lack of transparency with regard to the wholesale charges and the identification of VAS numbering. Nevertheless, having received a pre warning, even without any specified price information in such an alert, one great advantage would be that customers could make an informed decision about whether or not to proceed with paying (potentially high) charges for VAS.

4.3.3.3. Website, call centre, application

Instead of a “push service” by means of a voice alert it could also be considered that customers actively “pull” information from the roaming provider’s website, call centre or via an application installed on the mobile device. However, lack of awareness may result in the majority of customers not actively pulling the information about VAS. In addition, as connections to VAS are a small part of the usual customer communications pattern, providers may not want to point out information about the charges to VAS in first place. From the implementation perspective, providing information on the website, call centre or application may entail no considerable effort, especially with regard to the technical implementation as Article 14 (2) of the Roaming Regulation already requires that customers must have the right to request and receive, free-of-charge more detailed personalised pricing information by call and SMS. In view of an assessment of such a measure, the use of Article 14 (2) could be analyzed in order to understand the user behaviour with a view to use such pull information. Currently, BEREC believes that a general warning by means of a website, call centre and/or application may not be a very efficient measure for preventing bill shocks of roaming customers.

4.3.3.4. Welcome SMS

A warning in the ”Welcome SMS” according to Article 14 of the Roaming Regulation would be a more targeted solution. Although it seems easy to implement, due to amending the existing processes and systems, the costs and technical feasibility would have to be further assessed. Immediately after crossing a border, customers would receive information about possible higher charges and will thus be aware of them. However, also the information about VAS in the “Welcome SMS” has some drawbacks. First, the amount of characters is technically limited due to the specifications of SMS. The “Welcome SMS” already includes various information, in particular about the crossing border, the applied roaming tariff, any possible FUP conditions and information how to access the free-of-charge 112 number. Additional information on the complex issue of VAS could lead to customers being overwhelmed, especially when also taking into account that customers additionally receive a “Welcome SMS” according to Article 15.

Instead of putting additional information about VAS in one “Welcome SMS”, an alternative a solution may be, to inform customers by means of a separate “Welcome SMS” for VAS. Due to receiving information about voice calls and SMS, data services and VAS there is a risk that information is overlooked by customers. In addition, as already pointed out, VAS are used less frequently and therefore it is uncertain that every customer needs general information about potential higher charges It seems more useful to inform those customers, who in fact want to use VAS. This could be achieved by an opt-in functionality, which means that customers who want to use VAS also while roaming inform their roaming provider. Based on the decision by the customer, the relevant roaming provider could provide certain users with targeted information. However, to inform the customer in more detail than only a general warning, the transparency issues at wholesale level would have to be solved first. Amending the provisions for providing a “Welcome SMS” with information on the usage of VAS and/or the possibility to introduce an opt-in functionality as described above, should be subject to closer scrutiny taking into account the technical feasibility and the efforts for roaming providers.

4.3.3.5. Bill shock warning and cut-off limit

Establishing a cut-off limit for VAS like for roaming data services (in consideration of a possible opt-out option) could be effective effective to prevent customers from bill shocks. Normally, VAS is not included in the user allowances and immediately incurs additional charges. By introducing and informing the customer of the VAS cut-off limit, unexpected charges might be avoided and the customer might, as a result, use VAS with more confidence. The drawback is the risk of cutting off the service when it is needed. However, this could be solved by providing a mechanism for customers to reactivate the VAS. A possible cut-off limit for VAS could be designed similar to the mechanism laid down in Article 15. As shown in practice, although there were relatively only few complaints, those complaints ,concerned significant bills (several hundred euros per case) and unexpectedly high compared to domestic charges for the end user. Therefore, BEREC is of the view that customers should be protected from such bill-shocks. An effective mitigating measure could be to introduce a financial limit for the use of VAS. However, such a solution would probably require to first solving the transparency issues at wholesale level. Subject to the availability of the relevant information and taking into consideration the existence of such a measure for roaming data service, a mechanism laid down in Article 15 for VAS may be feasible with some effort although it would require further study to assess feasibility due to differences in the conveyance of data and voice traffic while roaming.

4.3.3.6. Online inquiry service

An online inquiry service that identifies the type of VAS a specific number is connected to, could be a user friendly tool, especially combined with more clarity on the applicability of RLAH (i.e such a tool could inform customers free-of-charge in case of roaming that the inquired number is a Freephone number). The most suitable solution would be for the inquiry service to also include pricing information. However such a solution would also require solving the transparency issues at wholesale level. The price information could be derived by making available the centralised EEA wide database as suggested above.

4.3.4. Other measures to protect from unexpected high charges

4.3.4.1. Safeguard in wholesale agreement

Some operators have proposed a safeguarding procedure between VAS provider, visited and home network providers to avoid fraud. It is not clear from the responses what type of mechanism or procedures are proposed. However, BEREC understands this to be a measure based on commercial terms that could be implemented by operators during bilateral negotiations if it does not violate the regulation. A few operators also said that the problems cannot be tackled via wholesale agreement since the rates are not negotiated at such a detailed level. It is therefore unclear for BEREC how efficient such a measure could be.

4.3.4.2. Justified blocking roaming calls to some VAS

Operators in the survey have proposed to block roaming calls to VAS. Such a measure must however take into account obligations in Article 28 (1) of the USD currently in force (Article 97 of the EECC) envisaging that NRAs shall ensure the full accessibility of all numbers throughout the EU “where technically and economically feasible” (the EECC reads “where economically feasible”), which lends itself to allowing derogations in case access to certain numbers (e.g. PRS numbers) would not allow cost recovery by the originating operators, with relevant impact on the “economic feasibility” concept. According to Article 97, NRAs and/or OCAs may on a case-by-case basis also require ECN and/or ECS providers to block access to numbers or services in justified situations of fraud or misuse. This could imply that access to e.g. PRS numbers could not be blocked in general by operators based on an assessment of economically feasibility. However, especially in the context of roaming it is not clear who has to assess the economic feasibility. In relation to blocking of VAS, BEREC points out that such a blocking may have the effect that essential VAS in particular harmonised services of social value like 116 000 hotline for missing children and 116 117 non-emergency medical service can not be reached by roaming customers.

4.3.4.3. Handle complaints case-by-case

Complaints are currently handled on a case-by-case basis in the absence of clear rules with regard to the regulatory treatment of VAS in roaming scenarios. From BEREC’s perspective this situation is rather unsatisfactory, and reconfirms the need to locate regulatory solutions to address the various concerns raised such as lack of transparency and risk of bill-shocks.

4.3.4.4. Extension of Wholesale Caps for VAS

In order to solve one of the root causes for high charges and the end users experiencing of bill shock for calling VAS, an extension of the termination rates regulation to also cover VAS could be assessed, at least, for services for which high termination rates are not justified by costs for additional services This could entail a step towards charging roaming calls to many types of VAS at the level of wholesale roaming caps, hence such services could be charged like ordinary roaming calls at the retail level. For VAS services, which entail higher termination rates, the EC could consider imposing price caps that will be designed to cover origination, transit and the respective termination rate applied at the domestic level for calls to these VAS numbers. The transparency measures of section 4.3.3 could also be used complementary to this measure. Especially with a view to some essential VAS like harmonised services of social value based on EC decision this measure would ensure that consumers do not receive bill shocks in situations of need.

4.4. Conclusions VAS

Based on the results from the online survey, BEREC’s internal survey on VAS and previous findings, BEREC is of the opinion that there is a lack of transparency both at the wholesale and retail level related to calls to VAS in roaming situations. This leads to an unpredictable

situation for end-users and bill shocks. However, most operators and NRAs reported to only have received few complaints from customers since RLAH entered into force in 2017.

As the suggestions indicate, one step to shed some light on unexpected roaming charges could be a common database for numbering ranges for VAS. Depending on the content of the database, it can be created with some effort. BEREC is in the process of completing such a database for voice-based PRS including directory enquiry services number ranges and might extend this tool to other number ranges allocated for other types of VAS. Such a database will provide information for operators about numbering ranges for VAS, but initially without tariff information and limited to one of the many VAS.

Although the lack of transparency seems to result in very few customer complaints, BEREC is of the view that regulatory certainty concerning VAS in roaming scenarios must be improved. The Roaming Regulation currently does not include any explicit provisions neither at the wholesale nor the retail level with regard to VAS. Currently, customer complaints are solved mainly on a case-by-case basis by operators where charges sometimes are waived.

In order to prevent losses for operators and bill shocks for consumers the regulation could to some extent be clarified with regard to the application of RLAH on VAS, both at wholesale and at retail level for the various types of VAS mentioned above. BEREC is aware that the lack of transparency and risk of surcharges for VAS cannot be solved solely within the Roaming Regulation. Any regulatory intervention based on the Roaming Regulation must therefore be cautious, consistent and in the context of the overall legal framework.

As from BEREC's perspective the Roaming Regulation needs clarificatoins with a view to the application of the RLAH concept for VAS needs. With regard to a possible legislative proposal the EC may take the following into consideration:

- The application of RLAH for Freephone services (b), UIFN (c) and EEA harmonised number range (e). It could be clarified that such services should also be reached free of charge when roaming within EEA. Alternatively, those services could be charged at a rate not exceeding the rate of an ordinary roaming call (e.g. using minutes from the bundle of the subscriber).
- The application of RLAH for VAS (a) in cases where there is no explicit split between the actual service and the connection part of the tariff ensuring that the relevant wholesale caps also apply.
- If and how RLAH should be applied for roaming calls to other special rate services (f) within the visited country or in a third country within EEA. How should the "domestic retail price" within the RLAH concept be defined? Would it be the price for calling a similar service at home in the home country, but lack of harmonised number ranges is a challenge and it would also imply a risk of negative margins for home operators.
- The extent to which Article 97 EECC (Article 28 USD) prevents blocking of roaming connections to VAS.
- Extending the regulation of termination rates also to cover VAS for which a high termination rate is not justified and furthermore extending the wholesale roaming cap regulation for VAS. However, wholesale prices applied to VAS at national levels are

not always regulated and as such any intervention at the roaming level will impact the national markets. This would be especially important for essential VAS like services of social value. This should be carefully considered in light of any other measures.

5. Ensuring sustainability of RLAH for virtually all operators

In its Opinion of June 2019, BEREC analysed the competitive situation of MVNOs and identified the main challenges, which mostly relate to the economic impact of providing roaming services (high wholesale charges and lack of roaming revenues). BEREC also analysed various measures to address the situation. The EC addressed the following question to BEREC:

1. *EC would welcome a further analysis of the measures identified in the BEREC Opinion (or any other measures), discussing particularly their complementarity with the roaming regulation in force (Article 3) and their potential impact, effectiveness and efficiency.*

5.1. Further analysis of the BEREC opinion measures

In the BEREC opinion, BEREC analysed the situation for MVNOs and resellers and assessed various potential measures suggested by the operators to address their challenges. BEREC proposed possible measures that the EC could take into account in their review to increase the competitive strength for MVNOs:

- Reducing wholesale caps, taking into account that MNOs need to recover their efficiently incurred costs to provide wholesale roaming services.
- Obliging the host MNOs to pass the discounts they receive for wholesale roaming services on to the MVNOs.

Apart from the two above mentioned measures, additional measures could be considered in any update of the Roaming provisions to improve the situation for MVNOs. These could be:

- Make sure that wholesale caps also apply to alternative wholesale roaming solutions like sponsored roaming. This does not prevent providers of such wholesale solutions from charging additionally for other services they offer.
- Include measures for incoming roaming calls for MVNOs.
- Include an obligation for MNOs to give non-discriminatory access to new technologies.
- Include time limits for signing of roaming agreements and technical implementation.

BEREC has further examined the measures proposed in its Opinion analysing in more detail the four aspects proposed by the EC. In particular, BEREC considers the following for each measure separately. It should be noted that BEREC's current analysis has not been based on any input received from the 2020 joint EC/BEREC survey as no relevant questions were included in the surveys addressed to NRAs and operators apart from the questions that are relevant to QoS for which there is a link with the "obligation for MNOs to give non-discriminatory access to new technologies" measures.

5.1.1. Reducing wholesale caps

Regarding complementarity to Article 3 of the Roaming Regulation, BEREC considers that this measure could be imposed as an update of Articles 7, 9 and 12 of the Roaming Regulation taking into account that MNOs need to recover their efficiently incurred costs to provide wholesale roaming services. Any reduction of the wholesale caps would have an impact on enhancing the sustainability for MVNOs by reducing their relevant costs for providing retail roaming services. In addition, this measure could directly impact MNOs wholesale revenues and especially those of net inbound MNOs, if the effective wholesale prices they charge on average are above the new price caps. However, as long as the lower wholesale caps cover the efficiently incurred costs, this impact will not undermine MNOs' sustainability. As regards effectiveness, it is noted that as price caps should cover efficiently incurred costs leaving also some room for negotiations, there is a limit on the level of reduction. Finally, BEREC considers that this is an efficient measure as it does not entail difficulties in its implementation in the roaming market. Nevertheless, this measure might not ensure the level playing field with MNOs, as those may still benefit from lower prices than the caps due to their stronger negotiation power.

5.1.2. Pass the discounts MNOs get on to the MVNOs

Concerning the complementarity to Article 3 of the Roaming Regulation, BEREC considers that this measure could fit in Article 3 by inserting stricter obligations regarding non-discriminatory terms and conditions for wholesale roaming access. This measure is expected to have a positive impact on the sustainability of MVNOs and BEREC has reasons to believe that it would be effective because the MVNOs could benefit from the discounts the MNOs receive on the wholesale charges. However, this measure is not considered to be efficient as it is not very transparent, and it entails complex implementation and supervision resulting in an increased burden for NRAs.

As an alternative and taking into account that most of MVNOs get their roaming access via their domestic hosts, the Roaming Regulation could empower NRAs to set lower prices than the regulated wholesale caps in the event of disputes in which the competitive situation does not allow MNOs from offering wholesale roaming services to MVNOs in a way that a level playing field would be ensured. This option could be also implemented as a complementary measure to the reduction of the caps. However, this option, either as an alternative or as a complement, might result in less harmonization across Europe. In addition, the regulatory burden for NRAs might remain high especially in case of host MNOs' reluctance to contribute to this level playing field.

5.1.3. Wholesale caps applicable to alternative wholesale roaming solutions[31]

BEREC considers that this measure could serve as a complement to Article 3 of the Roaming Regulation via extending its scope and would have a positive impact as it will contribute to

[31] For example like sponsored roaming. Sponsored roaming is a wholesale solution where the applicant uses a dual IMSI solution, where one IMSI range belongs to the sponsored network. The effect is that the applicant's

more equal terms for MVNOs competing in the retail market irrespective of the type of access and might also enhance competition on the market for wholesale resale roaming access. Furthermore, this measure would have an effect for MVNOs that are not hosted by an MNO and have not obtained wholesale prices at the level of the caps. As regards its efficiency, BEREC has reasons to believe that this is a measure easy to implement, but only with impact for few MVNOs.

5.1.4. Measures for incoming roaming calls for MVNOs

This particular measure could be imposed in the context of Article 3 of the Roaming Regulation. When designing such a measure, one has to consider that the termination rates will be harmonized with the delegated act to be expected by the end of this year. BEREC considers that, although this measure would result in more equal terms for competition in the retail market for MVNOs, it would have a low impact on MVNOs' sustainability as it refers only to one of the available roaming services (i.e. incoming calls). This measure is considered effective as MVNOs would get better terms for something currently unregulated. It is also considered efficient as it is easy to implement.

5.1.5. Obligation for non-discriminatory access to new technologies

This proposed measure could be imposed in the context of Article 3 of the Roaming Regulation and would contribute to more equal terms for competition in the retail market for MVNOs. However, in order to ensure its effectiveness, it should be combined with fair and non-discriminatory terms and conditions. BEREC believes that this is an efficient measure as it does not entail difficulties in its application. The details of this measure are presented in the QoS section above.

5.1.6. Time limits for signing agreements and technical implementation.

Article 3 of the Roaming Regulation includes time limits for providing a draft contract and for the technical implementation. However, it might be challenging for operators receiving many such requests simultaneously. This could lead to a delay regarding technical implementation. Finally, it needs to be noted that dispute resolution procedures – for example where agreements cannot be reached within the required time frame – might entail high costs for the access seeker. Therefore, operators could be urged to put the effort required in order to avoid the need for dispute resolutions. Furthermore, there could be also a role for NRAs to proactively monitor the developments and in case of problems they can have a supporting role to facilitate access.

end users have a second identity while roaming and they can make use of all the roaming agreements belonging to the sponsor network. Traffic prices are set by the sponsor network and not the host of the MVNO for its national services

6. M2M and 5G

In its letter to BEREC, the EC raises certain issues related to permanent roaming for M2M in the context of approaching 5G. The following questions were addressed to BEREC:

- *Would BEREC see a need for specific rules at retail or wholesale level, concerning permanent roaming in M2M? If so, what would be the pros and cons of explicitly addressing M2M permanent roaming? What would be the possible impact on the single market and on national markets and the associated benefits and risks?*
- *In this framework, we would welcome an analysis of the precise boundary defining M2M services as well as any comments on the competition with operators of specific technologies (e.g. narrow-band IoT operators).*
- *At the wholesale level, do you see a need to oblige MNOs to negotiate in good faith and within specific deadlines for wholesale agreements, to provide permanent international roaming for M2M communications? What would be the impact, effectiveness and efficiency of such a measure?*
- *Would BEREC see a need for revising the wholesale rules, in order to enable new pricing structures (e.g. non-volume based tariffs) befitting the M2M market? If yes, would BEREC see also a need for setting caps in M2M wholesale charges and how should the new Regulation ensure that permanent roaming for M2M is sustainable for the wholesale operator? What would be the impact of imposing such a measure?*

The following subchapters provide feedback and answers to the four questions above.

6.1. Background

In 2016 BEREC published a Report on Enabling the Internet of Things (IoT)[32] with the conclusion that permanent roaming scenarios for M2M communications services have to be assessed on a case-by-case basis[33]. Also, BEREC concluded that *"in order to ensure legal certainty to all players involved, further clarification in the Roaming Regulation and/or in a Commission Communication as to permanent roaming in the IoT context might be helpful."*

As BEREC points out in its Opinion of June 2019 IoT and M2M traffic is expected to see very rapid growth over the next few years. Global connectivity through international roaming is a success factor for many services and applications belonging to this market. So based on this, the message is repeated: There is a need for more clarity regarding the applicability of the Roaming Regulation for M2M/IoT connectivity services.

The 5G technology promises networks with better performance and easier characteristics when it comes to speed, latency, and virtualisation. One of the novelties of 5G is "network slicing", which is one of the most promising features in terms of flexibility and configuration of the network for specific purposes. This functionality may create different logical/virtual

[32] https://berec.europa.eu/eng/document_register/subject_matter/berec/reports/5755-berec-report-on-enabling-the-internet-of-things

[33] Also stated in GL 191 of BEREC Retail Roaming Guidelines BoR (17) 56.

networks on the same mobile network, thus allowing for each network its own key characteristics dedicated to a client's specific need.

In the joint EC/BEREC survey of April 2020, operators were asked about the impact of M2M on the current RLAH regulation. In the market there is currently no unanimity about how M2M services should be treated in the Roaming Regulation. In fact, there are different views according to the answers received. On the one hand, 32 % of the MNOs claim that current RLAH regulation should not apply to M2M and IoT services, as they require separate, tailored roaming set of rules. On the other hand, 20 % of the MNOs expressed the need to clarify current RLAH regulation and introduce specific aspects with regard to charging models to cater for M2M services, permanent roaming and transparency rules. These services are considered by this group of respondents to be different by nature from current RLAH regulation and they point out that charging models for M2M/IoT services are in several cases incompatible with the current RLAH regulation – the argument being that the usage pattern for M2M/IoT services is substantially different from that of ordinary roaming users.

Besides, 10 % of the MNOs expressed that they expect no impact and no changes as M2M and IoT already exist in 4G networks and there are no major issues with permanent roaming as permanent roaming is excluded from the scope of the wholesale contracts. Additionally, 15 % of the MNOs manifested that further studies are needed as it is not clear at this point whether IoT and M2M will require any specific regulatory measures, given that commercial business to their agreements may prove to be capable of avoiding any non-agreed permanent roaming. Among these, six respondents consider that roaming partners should commercially and contractually have the freedom to negotiate the functioning and pricing of M2M and IoT services. Finally, 23 % of the MNOs did not provide information about the impact of M2M and 5G.

From the MVNOs perspective, out of 106 respondents 29 % of the MVNOs did not provide any considerations regarding this question as they do not offer M2M services and have not assessed the market development and business implications. Many of them do not have any plans to offer these services in the short term. Still 13 % of the MVNOs consider that new IoT markets for MVNOs for wholesale mobile roaming will provide opportunities to offer international enterprises mobile roaming across the EU using non-geographic SIM cards, requiring MNO wholesale prices to be limited. The rest of the MVNOs (58 %) did not provide an answer about the impact of M2M and 5G.

To sum up, there is not a consensus among the operators about how M2M services should be treated in the current Regulation so it seems that there is a need for more clarification of M2M/IoT connectivity services in the context of the Roaming Regulation, in particular concerning the charging models as well as permanent roaming. Despite this variety of opinions in the feedback received from the market players, BEREC has already had an opinion about this issue and has expressed its understanding of issues related to M2M it its guidelines and reports. These are the main ideas influencing BEREC's work:

- M2M traffic is covered by the current Roaming Regulation. This stems from the fact that the transparency provisions do not apply to M2M devices which use mobile data communication (Art. 15 (4)) – but this is the only exception and therefore, the rest of the provisions do apply to such traffic.

- For wholesale roaming agreements, there is the possibility for the two parties to agree on the financial terms by not taking into account the regulated wholesale caps (Article 3(4)) as the basis for any charge between the parties. An example where this could be applicable are agreements on permanent roaming for M2M communication/services.
- On the other hand, Guideline 29 of BEREC Wholesale Roaming Guidelines[34] foresees the application of less stringent measures, before terminating a wholesale roaming agreement due to permanent roaming.
- Guideline 191 in the BEREC Retail Roaming Guidelines states that *"the Roaming Regulation makes reference to customers that travel periodically. However, it is common for devices for M2M communications to be used on a permanent roaming basis. To that end, it may make sense to assess M2M communications on a case-by-case basis taking account of standard scenarios."*

6.2. Need for specific rules on M2M permanent roaming

According to the Roaming Regulation, although visited networks may prevent permanent roaming from being included in the wholesale roaming agreements, they may negotiate commercial agreements freely. In fact, 45 % of the MNOs have signed wholesale agreements with permanent roaming for M2M while the number of problems or NRA interventions have been low so far. However, the most often mentioned difficulty by MNOs to reach agreements with in relation to permanent roaming has been the refusal to include permanent roaming for M2M (see 6.4.1).

With the introduction of RLAH, permanent roaming has been seen as an opportunity for abuse by taking advantage of the regulation through arbitrage or making different uses of periodic travels. However, there are more and more cases of use (see M2M services in the next question) where permanent roaming for M2M and IoT services allows more and new cross-border services to be offered in the EEA. With the advent of 5G and network slicing techniques, the potential for providing more M2M and IoT services will increase. Moreover, the widespread use of permanent roaming for any service would blur the lines between the international roaming market and the domestic mobile access and origination markets.

Therefore, BEREC considers that the upcoming Roaming Regulation review should serve to clarify and introduce legal certainty regarding the conditions and/or criteria under which permanent roaming for M2M and IoT services can be provided. To reach this situation there must be a compromise between measures to prevent abuse and the obligation to negotiate permanent roaming when limited to offering M2Mservices. In this way, barriers to entry for new providers of M2Mconnectivity services can be removed and competition between operators and services in the EEA can be promoted.

[34] "Operators could also include in their Reference Offers measures that are less stringent than the measures set out in Recital 12 Roaming Regulation, e.g. by using higher wholesale charges which do not exceed the maximum wholesale caps provided in the Roaming Regulation for volumes exceeding an aggregated volume specified in the agreement".

6.2.1. Pros and cons for rules on permanent roaming for M2M services

In accordance with the proposal to consider the clarification of permanent roaming in the Roaming Regulation for the provision of M2M services, the main identified pros and cons are listed in the following table:

Permanent roaming for M2M services	
Pros	Cons
Allow more providers to enter the market to provide M2M connectivity services.	Abuse and arbitrage if permanent roaming is not restricted in some way to M2M/IoT applications.
Development of new business models for M2M services with mobility in EEA.	M2M connectivity service providers may connect to the visited network with the best coverage while domestic M2M connectivity service providers may be linked only to their host.
Reduce barriers for MVNOs to reach direct agreements with hosts in other countries.	
Commercialize M2M connectivity services outside the country of origin.	
Increase harmonization in governance of use cases of permanently roaming IoT/M2M devices across the EEA.	

It is difficult to specify the impact on the single market and the domestic market. One of the reasons is, for instance, that market shares and the operator's market positions differ across the EEA. In general, BEREC is of the opinion that it would be beneficial for both the established market players and new entrants to clarify the provisions with regard to permanent roaming in general and also specifically for M2M Services.

6.3. M2M definitions

6.3.1. M2M-market by operator category

Currently, 86 % of all MNOs (70 out of 87) are offering M2M services, while among the MVNOs only 14 % (14 out of 106) offer this kind of service. This shows that M2M services are largely the playground for the MNOs.

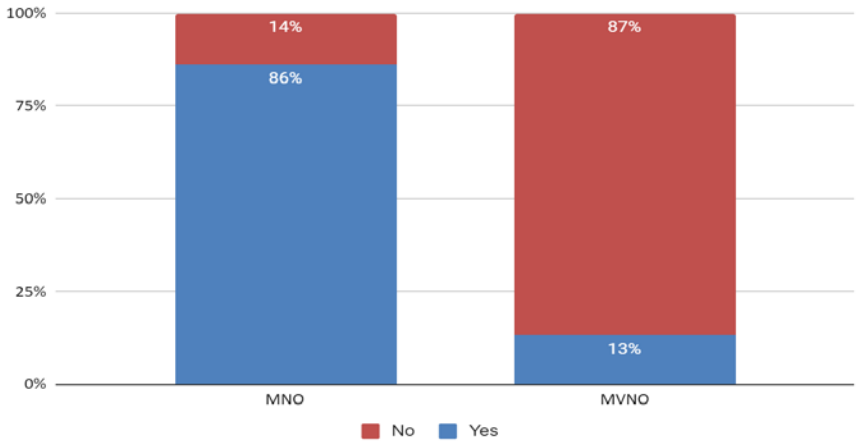

Figure 15: MNOs and MVNOs answers to if they offer M2M services.

6.3.2. M2M services

According to the respondents there is a wide variety of M2M services. The most common M2M services mentioned relate mainly to in automotive business[35], smart metering solutions[36], industrial services and transport solutions[37] (see Figure 16).

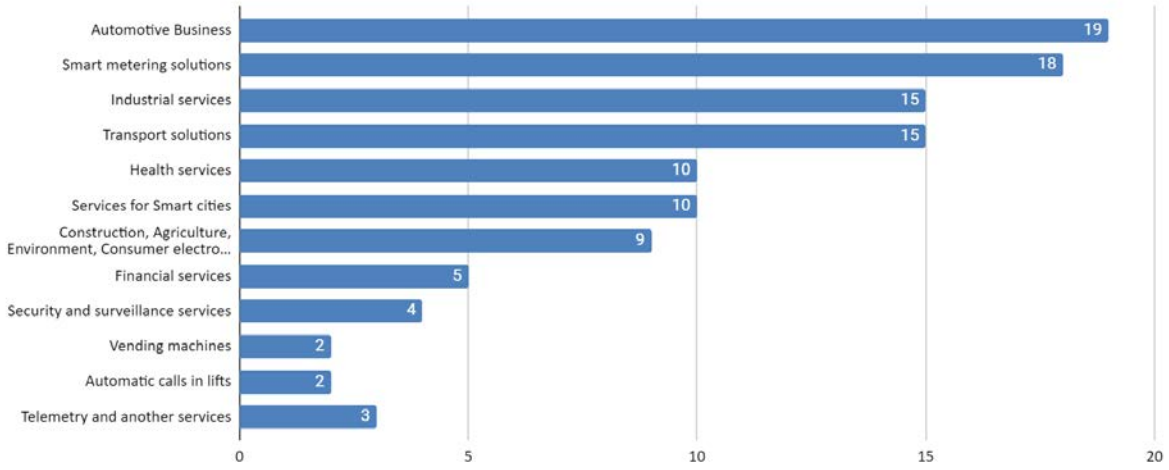

Figure 16: M2M services mentioned by MNOs and MVNOs.

Although not all M2M services require mobility, many of them do – especially those related to the automotive business and transport solutions. For such services, roaming may become very relevant for cross-border scenarios.

[35] E.g car tracking, eCall, telematics, remote services or navigation, smart parking and “infotainment” services.
[36] Such as intelligent buildings or utilities like charging systems (electricity grid, gas and water supply, etc.)
[37] Such as logistics, supply chains, production, manufacturing or smart enterprise management.

6.3.3. Definitions and boundaries

Regarding the boundaries of M2M services, BEREC considers that they may be found in the EECC and they are applicable to the Roaming Regulation.

In fact, there are several references to "transmission services used for the provision of machine-to-machine services" (recitals 260 and 276, Article 2.4.c, 102 and 105 of the EECC). These transmission services are data, SMS or voice services which may provide the connectivity required by M2M services. This group of transmission services could be called M2M connectivity services to distinguish them from M2M services, whereby the latter are not necessarily provided by ECN/ECS providers.

Also, recital 249 of the EECC defines M2M services as those services involving an automated transfer of data and information between devices or software-based applications with limited or no human interaction.

This differentiation between M2M connectivity services and M2M services is relevant in the Roaming Regulation because electronic communications providers are those who pursue wholesale roaming agreements and they are concerned with roaming and the underlying connectivity to provide M2M services at the wholesale level.

In addition to the above, BEREC concludes in its Report on the Internet of Things indicators[38] of 2019 that IoT is a wider concept than M2M and that these two terminologies cannot be used interchangeably. The ITU has also adopted a broad definition for IoT that includes the "global infrastructure for the information society, enabling advanced services by interconnecting (physical and virtual) things based on existing and evolving interoperable information and communication technologies". [39]

The main difference is that, while M2M services are mainly based on automated information exchange with no or little human intervention, in IoT services human intervention is an additional possibility depending on the nature of the service concerned.

This is relevant for the future Roaming Regulation review as it might not be sufficient to take into account permanent roaming only for M2M services. One should also analyse what impact permanent roaming will have on aspects that are more specific to IoT services given the great variety of use cases that will be available and the blurred boundary between human-only services and IoT communication services.

Said that, as reported in BEREC's Report BoR (19) 25, "currently, every IoT/M2M-Service depends on some kind of Connectivity". Indeed, technologies such as NB-IoT or LTE-M are included in the underlying connectivity to provide M2M and/or IoT services and there are

[38] https://berec.europa.eu/eng/document_register/subject_matter/berec/reports/8464-berec-report-on-internet-of-things-indicators

[39] Recommendation ITU-T Y.2060 Series Y: global information infrastructure, internet protocol aspects and next-generation networks.

national deployments from one or more MNOs per country in most of the EEA countries[40]. Nowadays, there are already roaming agreements[41] using NB-IoT across Europe – even for MVNOs (a respondent mentioned NB-IoT to describe its M2M services offered) – and it is probably only a matter of time before such agreements are established between the other roaming providers that have deployed these technologies.

6.4. Challenges in negotiations

There are substantial differences in the number of responses between the two categories of operators about the difficulties they have identified when establishing M2M agreements including permanent roaming. To address this question, it seems useful to evaluate the responses from MNOs separately from the MVNOs. In this way a more thorough analysis of the challenges related to operator's size and the difficulties they identified can be done.

6.4.1. Responses from MNOs

From the MNOs' responses to the survey the following observations are made:

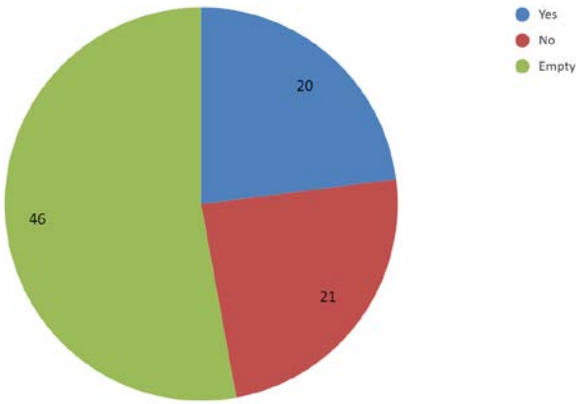

Figure 17: Number of MNOs about difficulties in establishing M2M agreements including permanent roaming.

Since more than half of the responding MNOs did not answer this question, (probably because they did not enter into the area of M2M permanent roaming), one should be careful with drawing conclusions based on the actual feedback received. Still, there seems not to be a large majority of concern among the remaining ones: 49 % (20 of 41) confirm they had problems, while 51 % (21 of 41) say they had none. Of the 41 MNOs who responded to this point, only two of those requested an intervention from the NRA.

[40] https://www.gsma.com/iot/deployment-map/#deploymentshttps://www.gsma.com/iot/mobile-iot-commercial-launches/

[41] https://www.telekom.com/en/media/media-information/archive/mobile-iot-roaming-goes-live-across-europe-598700

Further, one can have a look at the difficulties given by the respondents and how these are distributed. It is noted that the respondents may have selected more than one issue:

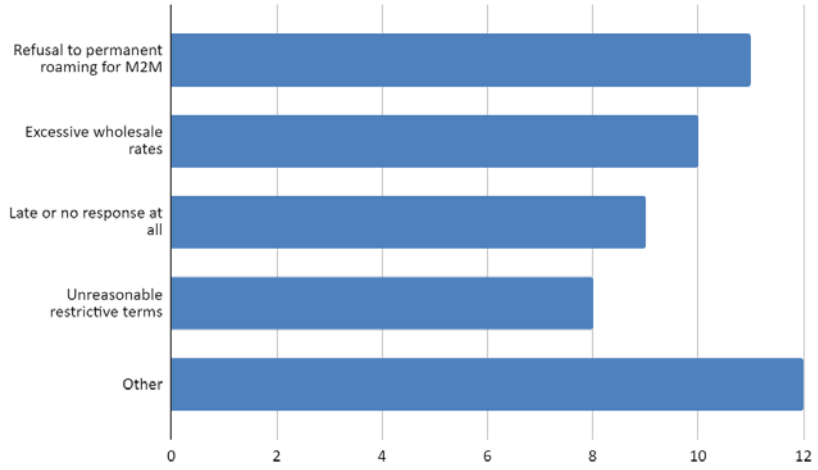

Figure 18: Number of MNOs encountering each type of difficulty.

The top three specific categories are 1) refusal to permanent roaming for M2M, 2) excessive wholesale rates and 3) late or no response at all. For 2) there was also evidence of this in the BEREC Opinion, where permanent roaming was reported to be excluded from the data discount agreements. BEREC notes that 50 % of the MNOs who answered “Other” specified that the difficulties were caused by technical issues, not commercial challenges.

To see whether smaller operators experience more difficulties, the grouping of the respondents according to how many subscribers they have, shows the following picture:

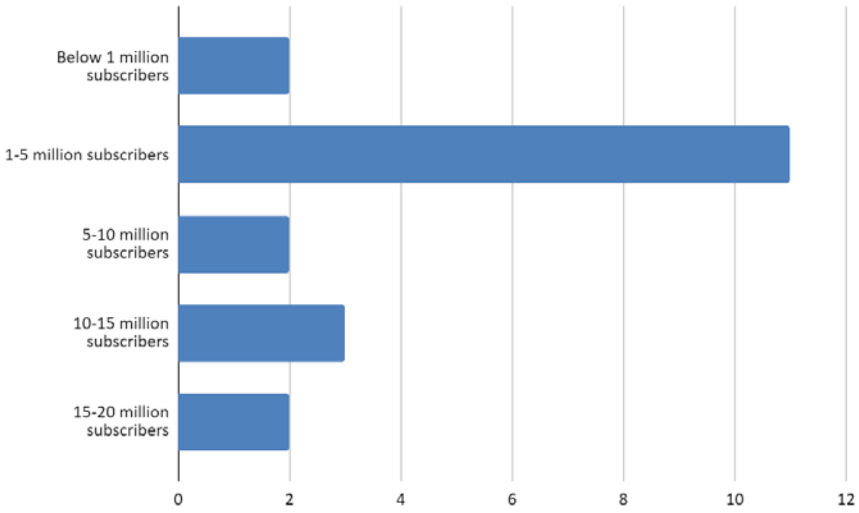

Figure 19: Number of MNOs that experienced difficulties according to their size.

From data analysis, it is difficult to conclude that only smaller operators run into problems. It seems that also some larger operators have experienced challenges when negotiating permanent roaming for M2M-services/communications.

6.4.2. Responses from the MVNOs

MVNOs were presented with the same question. Their responses are as follows:

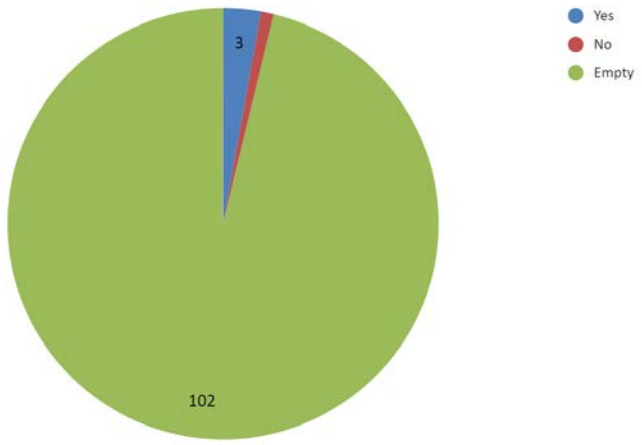

Figure 20: Number of MVNOs responses about their difficulties in establishing M2M agreements including permanent roaming.

Here, the trend is even stronger: Very few provided feedback to this particular question (probably because they did not enter into the area of M2M permanent roaming). Among those that did 75% (3 of 4) confirm they have experienced problems while 25% (1 of 4) say they did not. But note again that most of the MVNOs have not sought to establish M2M agreements yet.

6.4.3. Should obligations to negotiate requests for M2M permanent roaming be introduced in the regulation?

Due to the low number of responses amongst the companies that returned the questionnaire, and based on the feedback provided, BEREC cannot claim that in general there are severe challenges for EEA operators to securing wholesale permanent roaming agreements for M2M-services. However, it should be noted that while most MVNOs provide communications services for ordinary end-users, MVNOs dedicated to the provision of M2M services are highly specialised niche operators representing a small percentage of all MVNOs.

While MNOs may prevent permanent roaming to avoid arbitrage as mentioned above, the same provision of Article 3 of the Roaming Regulation may be used to refuse, hinder or delay negotiations with permanent roaming for M2M services. Responses point to this being a problem for some of the operators.

BEREC suggests that the EC evaluates whether some regulations should be introduced in Article 3 of the Roaming Regulation to include amendments about permanent roaming for M2M/ IoT services.

What could also be done is to point out that NRAs are available/would have a role should the parties not reach an agreement within a sensible time frame, or if there are disagreements between the parties about how to use and understand the meaning of the regulated caps. More clarity in the regulation could make sure that the NRAs are better positioned to reach homogenous decisions across the EEA.

6.5. Is there a need to revise the existing wholesale charging mechanisms?

6.5.1. Use and distribution of charging mechanisms

According to the responses, only few MVNOs are in the market. This points to a somewhat traditional market situation where radio access network owners seem better positioned to offer M2M/IoT connectivity services, and potentially also M2M/IoT services. Further, this perhaps also explains the distribution of different M2M wholesale charging mechanisms which are still rather traditional. The following graph shows the distribution of replies regarding the wholesale charging mechanisms for M2M/IoT connectivity services:

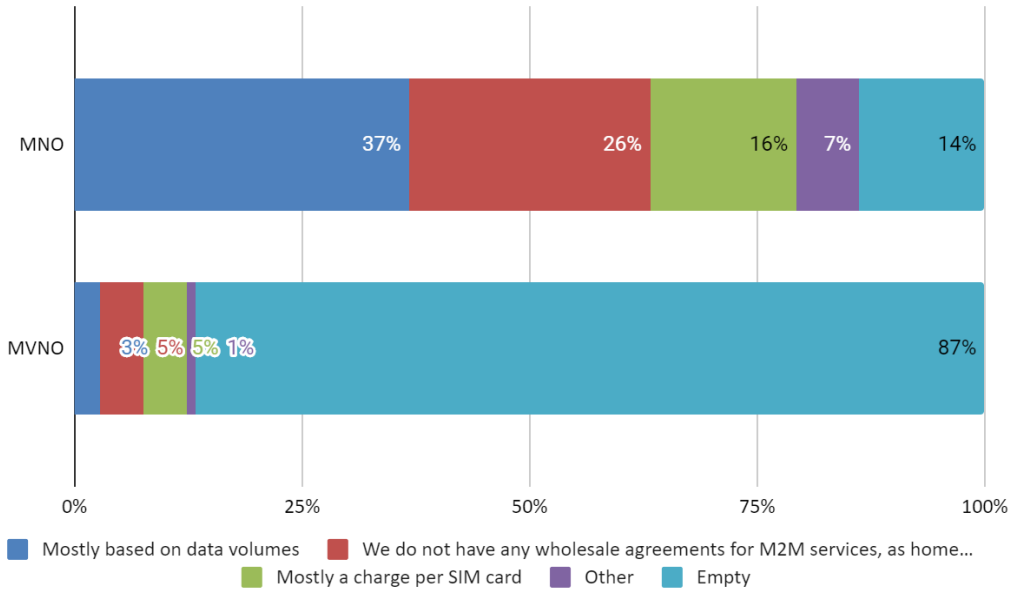

Figure 21: Wholesale charging mechanisms.

It seems that charging by data volume is the prevailing mechanism for M2M wholesale agreements. This is especially the case for the MNOs, where 37% of the respondents confirmed this. About 16% have agreements where a charge per SIM card was applied. For the MVNOs, the corresponding numbers are 3% and 5%, respectively. But again, 14% of the MNOs and 87% of the MVNOs did not reply because they have not sought to establish an M2M agreement and 26% of the MNOs and 3% of the MVNOs mentioned that they do not have any wholesale agreements for M2M services as home operator.

Still, as said in BEREC's 2019 Opinion, there was some (about 14% of the MNO respondents) feedback that RLAH was not necessarily designed to cover a wide range of M2M/IoT scenarios and the global nature of these services.

6.5.2. Conclusions on M2M/IoT connectivity services, permanent roaming and 5G

With the information currently available on the billing of M2M/IoT connectivity services, as well as the expected bouquet of new services that is likely to materialise during the next years, BEREC believes that there is a need to introduce changes in the Roaming Regulation to meet the specifics of M2M/IoT connectivity services.

To foster competition and innovation in the single market, and secure a more level playing field between established operators and new entrants, it is suggested to closely look at the possibility to introduce access obligations for M2M/IoT connectivity services requiring permanent roaming.

BEREC is further convinced that there is a need to revise the existing regulated charging model which is based on volume alone. Especially for permanent roaming scenarios, the concept of RLAH may not fit M2M/IoT connectivity services neither from the visited nor the home operator's point of view. Currently, other forms of billing are feasible such as billing by signalling or by SIM. While the first may require developments in the operators' billing systems, the second is already in place.

Although the EC asks about M2M services and permanent roaming, BEREC considers that the concept of IoT is wider than M2M. So, it would be relevant to analyse what impact permanent roaming would have on IoT connectivity services given the great variety of services that will be available in the near future, especially with the deployment of 5G and the human-only services.

Currently, BEREC is not in a position to specify which wholesale prices would fit the different mechanisms. Our suggestion is that, as a first step, the Axon cost model gets updated to better reflect the specifics of M2M/IoT connectivity services. As a second step it should also include 5G technology, both the radio access network and the core network architecture. This would make it easier to analyse costs in relation to the M2M and IoT connectivity services considered most relevant for roaming scenarios. Either way, BEREC underlines the importance in working with the Commission to further clarify possible charging mechanisms – especially in light of the introduction of 5G.

7. 112 enforcement

The EC is also seeking responses about 112 enforcement. The following questions were addressed to BEREC:

1) *Do BEREC members have competence and, when so, do they monitor if a customer of an MNO in the NRA jurisdiction travelling to other countries have access to emergency services in the visited country, fully adhering to the provisions of Article 26 of the USD, including par 26(4) that addresses equivalent access to emergency services for disabled end users. What are the outcomes of such monitoring exercises so far? We are in particular interested to provisions ensuring:*
   a) *Free-of-charge access to emergency services in the visited EU country by calling 112*
   b) *For customers, living with a disability, free-of-charge access to emergency services in the visited EU country, by using alternative means of access (access is ensured and 0-rated through SMS to 112, Emergency Applications, etc.)*

2) *Do you consider that, once Article 109.6 of the Code will become effective, it will be possible for BEREC members to monitor:*

   a) If caller location of a customer of an MNO in the NRA jurisdiction will be provided to the most appropriate PSAP when initiating an emergency communication in the visited EU country?
   b) If the caller location will be established and provided free-of-charge for the customer when initiating an emergency communication is the visited EU country? For example, would you be able to monitor that a handset based location information transmitted through SMS or data connection will be 0-rated for the end-user when initiating an emergency communication in the visited EU country?

The following subchapters are providing answers to three questions above.

7.1. NRAs' competences

In BEREC's understanding the question raised by the EC aims at monitoring process of free-of-charge 112 access of customers from the Member State of the NRA travelling to another country. BEREC points out that depending on the different perspectives, 112 access in roaming situations includes several scenarios. Therefore, with a view to a common understanding, BEREC has identified the main scenarios for monitoring 112 access including the potential responsibilities for NRAs. As indicated in its question, the EC seeks to learn whether BEREC members have the competence to monitor whether customers of an MNO (domestic MNO) in the NRA jurisdiction (domestic NRA) travelling to other MS have access to emergency service 112. The different roaming scenarios from this perspective will be discussed in more detail below.

According to Article 26 USD MS have to ensure that all end-users of publicly available telephone services are able to call emergency services free-of-charge by using the single European emergency call number 112. MS could determine which body was to be responsible for ensuring the required access to 112. NRAs have been empowered to supervise and enforce the corresponding provisions with regard to emergency access. Within the framework of the rules, some of the NRAs define and update the technical guidelines for providing access

to emergency calls in line with the provisions laid down in the European directive. Furthermore, NRAs have to provide operators of electronic communication networks with the data necessary for the provision of emergency services. Nevertheless, the public safety answering points, which are reached by dialling 112, are mainly operated by the federal states in the MS.

7.1.1. Different scenarios with a view to access emergency service 112

A) Outbound roaming

According to BEREC's understanding, the scenario described in the EC's question can be considered as outbound roaming, which means that a roaming customer leaves his home country and travel to another MS using a visited mobile network for roaming services including free-of-charge calls to 112. In general, a call to free-of-charge emergency service 112 involves both the retail level and the wholesale level. At retail level, the NRA of the domestic mobile service provider who offers roaming services and bills the roaming customer in particular has to ensure that the domestic mobile service provider does not bill the customer for calls to 112. At the wholesale level, the domestic mobile service provider has contracted roaming partners in MS where it offers roaming services to its customers. As the investigation powers of the NRA of the domestic mobile service provider is restricted to the domestic MS territory, the NRA of the visited network provider would be the reference for ensuring the relevant legal provisions concerning 112 in the visited country.

B) Inbound roaming

In addition to the outbound roaming scenario, there is also an inbound roaming scenario in which the competences are vice versa. This means that the NRA, who is responsible for the retail level in case of outbound roaming, also has to ensure that the domestic mobile service provider complies with the provisions concerning granting access to emergency services transposed in national legislations for its roaming partners. The reversed competence applies also for the NRA, which in case of outbound roaming is responsible for ensuring compliance at the wholesale level. In case of inbound roaming, this NRA would be responsible for the rights of the visiting customer.

To conclude, there are four different scenarios with a regard to access to emergency service 112 while roaming:

a) Outbound roaming retail level is in the responsibility of the NRA of the roaming customer travelling from home MS to another MS.

b) Outbound roaming wholesale level is in the responsibility of the NRA of the visited network operator

c) Inbound roaming retail level is in the responsibility of the NRA of the visited network operator

d) Inbound roaming wholesale level is in the responsibility of the NRA of the roaming customer visiting another MS

It is worth noting, that although at the retail level the call to emergency services must be free-of-charge, at the wholesale level costs could occur. Neither the Roaming Regulation nor the USD or EECC includes provisions about wholesale charging for connections made to 112. Therefore, either the domestic mobile service provider, which offers roaming services, must bear the wholesale costs itself or no costs are charged between operators at wholesale level in roaming scenarios at all. The joint EC/BEREC survey does not give a clear view on what wholesale charges are incurred with a view to the access emergency services. The majority of operators indicate that they provide free-of-charge access to emergency service 112 in their network and in addition that they assume that their customers receive free-of-charge access to 112 in the visited network.

As briefly outlined above, apart from the different roaming scenarios there are a number of parties (i.e. ministries, NRAs, federal states and providers of ECN) involved in the provision of emergency services. This number of parties is even larger in a roaming scenario, where mobile providers have contracted several roaming partners, which are being administered supervised by their NRAs.

To get a picture of monitoring the free-of-charge access to emergency 112 services in the visited EU countries, BEREC, in addition to the online survey of the EC, BEREC conducted a survey asking its members whether they were empowered to supervise and enforce the provisions with regard to access to 112.

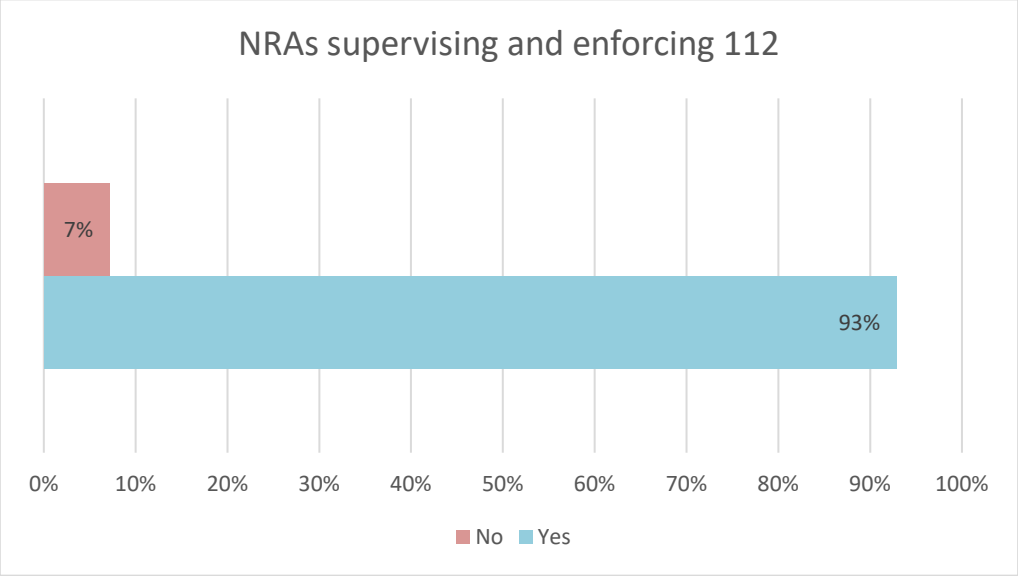

Figure 22: Number of NRAs empowered to supervise and enforce 112.

As figure 22 shows, all NRAs of the responding 27 are empowered to supervise and enforce provisions with regard to emergency access. As NRAs which such powers, they were asked whether they monitor free-of-charge access to emergency services in practice. In this regard 80 % of those NRAs, are monitoring such access. BEREC notes, that there is no common understanding on what monitoring of free-of-charge access to 112 must include. In particular, the monitoring process can be designed in many different ways. There is active monitoring, e.g. test calls to 112, regular exchange with operators, ministries, consumer associations or operators of the PSAPs, and there is passive monitoring based on consumer complaints that

refer to charges on access to 112. From the 80% of the NRAs who monitor, nearly half (45%) are monitoring domestic users travelling in another MS (outbound roamers) while about two thirds of those NRAs (65%) are monitoring roaming customers travelling to the MS of the NRA (inbound roamers). Free-of-charge access to emergency service for both inbound and outbound roamers is monitored by 24% of the NRAs.

7.1.2. Users with disabilities

As regards users living with disabilities, 60 % of the NRAs, which are empowered to supervise and enforce access to 112 emergency services, monitor an appropriate free-of-charge access for domestic users. In case of users with disabilities visiting another MS, 28% of NRAs monitor the appropriate free-of-charge access to 112 in the visited country. As to the reversed situation, around, the free-of-charges access for inbound roamers with disabilities is monitored by 40% of the NRAs. Nearly the same amount of NRAs (20 %) are carrying out monitoring for both inbound and outbound roamers with disabilities.

7.1.3. Conclusions

To summarise, almost all MS have empowered NRAs to supervise and enforce the provisions with regard to access to 112 in their MS. Within their supervising and enforcing competences, a large number of NRAs have carried out various monitoring processes at national level and a significant number of NRAs monitor the availability of free-of-charge access for disabled users. A smaller number of NRAs also monitor both inbound and outbound roamers. Currently, BEREC has no indication that there have been issues with accessing emergency service free-of-charge in the context of roaming within the EEA. In addition, according to the available information, NRAs have not received complaints neither concerning free-of-charge access nor what regards appropriate access to 112 for users with disabilities.

The above is also evidenced by the answers given by the operators in the current online survey. All responding MNOs reported ensuring free-of-charge access to emergency services in the visited country and 83 out of 87 MNOs make sure that all roaming customers in their network have access to emergency services 112 to the most appropriate PSAP. Moreover, 83 out of 106 MVNOs ensure access to emergency services 112 in the visited country in the context of all their roaming wholesale agreements. The MVNOs do not otherwise have the responsibility for accessing 112 numbers and as a result do not have an influence on providing such access. Finally, the vast majority of operators are of the opinion that the free-of-charge access to emergency services is a European obligation. This shows that operators also with regard to the Roaming Regulation are aware of ensuring free-of-charge access to roaming customers including disabled customers while travelling in the EEA.

7.2. Powers according to Article 109 (6) of the EECC

BEREC asked its members if their current competences will remain or new tasks will be derived when Article 109 (6) of the EECC will become effective, since this depends on the national implementations. 17 of 27 NRAs answered that their current competences will not

change. Nine NRAs replied that it was too early to give an answer on this and one NRA did not respond.

As regards question 2a of the EC, BEREC notices that from the 17 NRAs two NRAs mentioned that they already monitor on the basis of the Roaming Regulation whether the caller location of a customer of an MNO in the NRA jurisdiction (outbound roamers) will be provided to the most appropriate PSAP when initiating an emergency communication to 112 in another MS. One of the 17 NRAs mentioned it will be a new task when in force and 13 NRAs answered they will monitor it. Finally, one NRA replied no without giving a reason.

In BEREC's understanding the obligation that emergency traffic must be terminated to the most appropriate PSAP is actually a wholesale obligation or at least an obligation between the terminating operator and the body who is responsible for the PSAPs. Due to its geographical jurisdiction, the NRA of the roamer's MS cannot enforce a visiting network operator to transfer calls to the most appropriate PSAP in the visited MS. The NRA from the home country of the roamer can only oblige the domestic MNO, who has a wholesale roaming access agreement with the visited MNO, that this obligation is implemented. Furthermore, the NRA with competences in the country of the visited MNO can supervise if inbound roamers are terminated to the most appropriate PSAP.

16 NRAs are planning to monitor the obligation for providing the caller location of a domestic customer free-of-charge to the most appropriate PSAP. One NRA replied that it was too early to know whether this task was going to be delegated to that NRA. Three NRAs answered they will not monitor providing free-of-charge provision of caller location. Seven NRAs did not answer mostly because the transposition is still ongoing and it was too early for them to answer the question about specific competences concerning 112.

When NRAs were asked if they were planning to monitor this obligation for providing the caller location of a domestic user travelling in another MS (outbound) free-of-charge to the most appropriate PSAP, six NRAs answered yes and 11 NRAs answered no. The reasons for not monitoring the obligation are due to the lack of supervisory responsibility of the NRA in the country of the visited operator (three NRAs), the lack of responsibility of the MNO to whom the obligation adheres to (one NRA) and the lack of competence to supervise contracts between the MNOs and the organizations responsible for the PSAPs. On the other side due to the ongoing transposition of the EECC, ten NRAs could not make any statements about future tasks concerning the supervision and enforcement of 112 access.

Finally, NRAs were asked if they have planned to monitor the obligation for providing the caller location of a foreign customer visiting their home country (inbound) for free-of-charge to the most appropriate PSAP. 12 NRAs answered they do, one NRA finds it is too early to know whether they will be responsible, further five NRAs answered with no and nine NRAs did not reply.

BEREC notes that NRAs who do expect to get the relevant competences, will monitor the obligation for providing the caller location free-of-charge to the most appropriate PSAP for domestic users and roaming customers visiting the country of the NRA (inbound). Monitoring this obligation in the relation between the terminating visited network and the PSAP in the visited country (outbound roaming traffic) seems much less certain. Eight NRAs answered that

the monitoring of obligations that adhere to MNOs of visited networks should be done by the designated NRA of the visited country.

In this regard BEREC concludes regarding questions 1 and 2, that the EC may clarify in the Roaming Regulation which MS (home or visited) must exercise its competences for supervising the obligations following from Article 109 (6) of the EECC in roaming scenarios at the retail and wholesale level. Although there seems to be no customer complaints at the retail level and no disputes at the wholesale level, a clarification about the provider responsibility for bearing costs at the wholesale level would give more regulatory certainty especially for NRAs. For free–of-charge calls to emergency services (retail obligation) BEREC considers it reasonable that the domestic NRA of the roamer's home MS should be responsible to supervise and enforce this obligation as the home operator bills its roaming customers and not the visited operator. For directing the call to the most appropriate PSAP and free-of-charge (wholesale obligation), BEREC is of the view that the NRA of the country where the emergency traffic is transferred to (i.e. in a roaming scenario from the visited network in the visited country) should be responsible to supervise and enforce this obligation. As regards charges for supplying and directing caller location information to the most appropriate PSAP, BEREC considers that this should be settled between the network connecting or providing access to the PSAPs and the party responsible for the PSAPs.

8. Impact of COVID -19

The COVID-19 pandemic has forced a number of measures, including lockdown and closing of internal as well as external borders, with severe consequences on travelling. International studies estimate that international roaming revenues will drop by 50% or more, because of COVID-19 related measures. The EC asks BEREC for the following input:

- *We would welcome BEREC's views on the possible impact of COVID-19 related measures to the international roaming market in the EEA.*

8.1. Possible impact of COVID-19

The pandemic crisis all over the world also has an impact on the telecoms operators, however, BEREC at this point in time cannot draw any conclusions on the size of the impact. But, due to the travel restrictions, BEREC expects the roaming traffic as well as the roaming revenues to drop significantly during this crisis. It is however much too early (still no data available) and it is still not clear how long the travel restrictions will apply and what scale the impact on the volumes and revenues will be.

With regard to the measures for the international roaming market that are currently under review, BEREC concludes that the measures and restrictions taken to fight against the COVID-19 crisis will not change the recommendations BEREC provides in this opinion to the EC. Especially as any new measure that will apply needs to be agreed on in the negotiations before the new Roaming Regulation enters into force. BEREC expects those negotiations not to be finished before the end of travel bans due to the COVID-19 crisis.