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COMMISSION STAFF WORKING DOCUMENT

IMPACT ASSESSMENT

Accompanying the

Proposal for a Regulation of the European Parliament and of the Council

on roaming on public mobile telecommunications networks within the Union (recast)

{COM(2021) 85 final} - {SEC(2021) 90 final} - {SWD(2021) 27 final} -
{SWD(2021) 29 final}

Table of contents

Glossary

Term or acronym	Meaning or definition
Alternative means of access to emergency services	Services used to contact emergency services, other than calls to 112. E.g. real time text, total conversation, SMS, emergency applications, web services, relay services. As defined in Article 2 EECC: (35) 'total conversation service' means a multimedia real time conversation service that provides bidirectional symmetric real time transfer of motion video, real time text and voice between users in two or more locations. Currently real time text is mandated in the Accessibility act for disabled end-user as of 2025.
BEREC	Body of European Regulators for Electronic Communications
Bill shock	The negative reaction a subscriber can experience if their phone bill has an unexpected charge.
DG CONNECT	Directorate General for Communications Networks, Content & Technology
EEA	European Economic Area
EECC (European Electronic Communications Code)	Directive (EU) 2018/1972 of the European Parliament and of the Council of 11 December 2018 establishing the European Electronic Communications Code
eSIM	Embedded SIM card
EU / Union	European Union
EUR (€)	Euro
€c	Euro cent
FUP	Fair use policy, a mobile operator can apply a fair use policy on regulated retail roaming services, provided at the applicable domestic retail price, to prevent abusive or anomalous use by roaming customers.
GB	Gigabyte
GSMA	GSM Association
Home operator	The operator with which the end-user has a contract
IA	Impact Assessment

Inbounder	An inbounder mobile operator has a customer base which consumes less mobile services abroad, than those consumed by the partner operators' customer base on its own network.
International Revenue Share Fraud	Artificial generation of traffic towards international destination ranges with high termination rates that are subject to revenue share.
IoT	Internet of Things
JRC	Joint Research Centre
LTE	Long-Term Evolution
M2M	Machine to machine communication
MB	Megabyte
MNO	Mobile Network Operator, an operator that builds its own network and has full control of domestic usage on its network
MS	Member State
MTR	Mobile Termination Rate
MVNO	Mobile Virtual Network Operator, an operator that rents access to a piece of the domestic operator's network and does not build its own access infrastructure.
NRA	National Regulatory Authority
OECD	Organisation for Economic Co-operation and Development
Outbounder	An outbounder mobile operator has a customer base which consumes more mobile services abroad (i.e. on the networks of partner operators in other EU/EEA countries), than those consumed by the partner operators' customer base on its own network (i.e. when acting as a visited network).
OTT	Over-the-top (services)
Q1,Q2, Q3, Q4	Quarter 1, 2, 3, 4
QoS	Quality of Service
Retail roaming services	Voice, SMS and data services that a roaming customer can use when travelling in another country

Rest of the World (RoW) roaming	Roaming in countries outside of the EU
Roaming	The use of retail mobile services (voice, SMS and data) when travelling in another country)
RLAH	Roam like at home, using regulated retail roaming services (voice, SMS, data) at domestic price
Roaming customer	A customer of a roaming provider of regulated roaming services, whose contract or arrangement permits Union-wide roaming.
Roaming provider	
SIM	Subscriber Identity Module
SME	Small and medium-sized enterprises
SMS	Short Message Service
Sustainability derogation	A measure of the Roaming Regulation intended to forestall any risk of domestic price increases. It allows an operator to impose a small surcharge to roaming traffic on an exceptional and temporary basis. It is authorised by the NRA, when an operator demonstrates that the provision of roaming services without the application of a surcharge would not be sustainable with its current domestic charging model.
Sustainability in RLAH context	In a RLAH context where roaming surcharges are abolished except in exceptional circumstances (fair use policy and derogations), we define sustainability as a measure of how much the provision of retail roaming services impacts the profitability of an operator. It shows the percentage by which the retail profit of an operator increases (positive sustainability) or decreases (negative sustainability), as a result of providing (retail) roaming services
Visited (network) operator	The operator that supplies services to the roaming end-user in a visited Member State
Wholesale (roaming price) caps	The maximum (average) wholesale charge for the provision of (wholesale) regulated roaming services.
Wholesale roaming services	An operator has to buy wholesale roaming services from a visited operator to be able to offer retail roaming services to his customers

VAS	Value added services refers to communication related to: (a) Premium-rate numbers, for which a domestic customer is charged more than for a regular call/SMS and which are used to provide, for example directory enquiries, weather forecasts, technical support and entertainment, as well as other services. Part of the total call charge is usually paid to the premium rate service provider (generally an entity distinct from the ECS provider), thus enabling business funding; (b) Freephone numbers, which are free of charge to domestic customers, for example a bank hotline, travel agency hotline, insurance helpline, including also harmonised European numbers for harmonised services of social value (116XXX numbers); (c) Shared cost numbers, for which a domestic customer pays only the charge for a local phone call, for example e-shops.
VAT	Value-added tax
Wi-Fi	Wireless Fidelity
3G, 4G, 5G, 6G	3rd, 4th, 5th, 6th Generation mobile network

1 INTRODUCTION: POLITICAL AND LEGAL CONTEXT

The roaming policy has been one of the European success stories, giving millions of consumers and businesses in the EU the benefits of the Digital Single Market in their daily life. The Roaming Regulation expires on 30 June 2022.

Roaming (in the sense of the Roaming Regulation) is a service that allows a customer of a public Mobile (Virtual) Network Operator (M(V)NO) in one EU/EEA country (the home operator) to access mobile services (voice, SMS or data) when travelling in another EU/EEA country, by connecting to the network of a Mobile Network Operator (MNO) in that country (the visited operator). It comprises a wholesale roaming service (provided by the visited operator to the home operator) and a retail roaming service (provided by the home operator to the roaming customer). The relevant retail and wholesale roaming charges are regulated (among others) in the Roaming Regulation. See also Annex 7 (How roaming works).

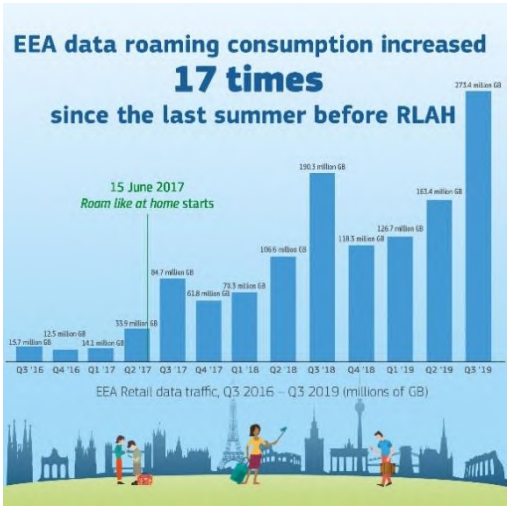
The Telecoms Single Market Regulation 2015/2120 mandated, after more than 10 years of regulating the EU roaming market, **the end of retail roaming charges in the Union** subject to fair use policy and a sustainability derogation by amending Regulation (EU) 531/2012 (Roaming Regulation).

Figure 1. Retail Roaming surcharges in the EU (2007-2017)

Since 15 June 2017, customers have had access to mobile services (voice, SMS or data) at no extra cost when travelling periodically in the EU/EEA. In these cases mobile operators are not allowed to levy any charges in addition to the domestic price for roaming services. These roaming rules are widely known as "**Roam-Like-At-Home" (RLAH)**. To prevent abusive or anomalous use of roaming services, such as permanent roaming at domestic prices, that may have detrimental effects on the domestic markets, mobile operators may apply a fair use policy.

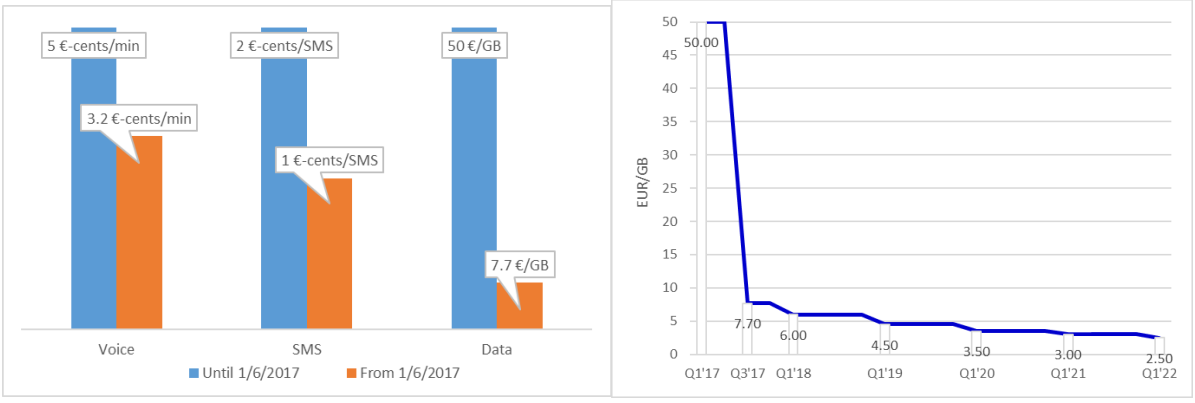
The rapid and massive increase in roaming traffic since June 2017, shows that the RLAH reform has unleashed the untapped demand for mobile consumption by travellers in the EU.

Figure 2. EEA data roaming consumption increase (Q3 2016 - Q3 2019)



The introduction of RLAH for end-users was complemented by measures aiming to ensure that operators can provide regulated retail roaming services in a sustainable way. In this context the term "sustainable" means that operators can either fully recover the cost of providing retail roaming services or at least that the incurred negative retail roaming margin is very small (less than 3%) compared to their domestic profits. At wholesale level, it called for a sharp decrease to regulated maximum wholesale rates (wholesale caps). Regulation (EU) 2017/920 reduced the wholesale caps by 36% for voice (to 3.2 €c/min), by 50% for SMS (to 1 €c/SMS) and by an initial 85% for data (from 50 €/GB to 7.7 €/GB), followed by a glide path with a last step at 2.5 €/GB in 2022. These price caps were designed to ensure that operators could also recover the costs of providing wholesale regulated roaming services.

Figure 3. Wholesale price caps reduction in June 2017 and data cap glide path (2017-2020)



This Initiative is included in the 2020 Commission Work Programme addressing the specific objective "**Digital for consumers**" and has to be seen in the broader political context of creating a **Europe Fit for the Digital Age**. The Initiative contributes to the ambition to make the most out of the digital transition to enhance opportunities to connect, communicate, solve societal issues and do business.

The Initiative is coherent with the logic of consistently addressing **barriers to the Single Market**[1], and taking actions to ensure that barriers already addressed will not re-emerge, like could be the case for the expiring roaming rules.

One of the main objectives of the Roaming Regulation is to protect consumers by reducing the level of charges that users of public mobile telephone networks have to pay for cross border services. It complements and supports the European Electronic Communication Code (EECC)[2], the regulatory framework for electronic communications, that Members States have to transpose by 21 December 2020. The EECC not only aims to enable high connectivity and 5G deployment for the benefit of all Europeans, but also to ensure effective protection of consumers through sector specific rules.

The Roaming Initiative is also complementary to the cross-border portability of online content[3]. Thanks to those two initiatives, Europeans are now able to travel throughout the EU without worrying about mobile roaming charges or losing access to music, games, films, learning tools, work platforms, sport events, health applications and other services for which they have already paid. For example, the roaming initiative also facilitates the access to **European digital culture**[4] since it gives end-users the confidence to stay connected and accessing content as for example Digitised Cultural Archives[5].

The EU Roaming policy has paved the way for several regions outside the EU to introduce similar approaches[6] to lower roaming charges in cross border settings to address similar market failures.

The European Commission has set as one of its main objectives to respond to the higher **connectivity needs of citizens and enterprises**[7] and to take advantage of the digital transformation to strengthen the social and economic resilience of the EU and the Member States, their sustainable growth potential and job creation. The Roaming initiative, by facilitating cross-border connectivity, contributes to these objectives.

Europe has already achieved wide 4G coverage (96% average and 99% aggregate 4G coverage in June 2019) and, despite some delays, operators have started deploying 5G networks. The new 5G infrastructure will further increase data consumption. To this end, the roaming initiative enables the seamless use of these infrastructures across borders.

Moreover, the COVID-19 pandemic has accelerated the trend towards the digital transformation, forcing the vast majority of Europeans to work, study and enjoy entertainment online. Once back to normal, learning, working, socialising and e-commerce applications,

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[1] Single Market Barrier Report COM(2020) 93 final confirms that when the single market is failing to reach its full potential, SMEs and citizens are the most likely to suffer.

[2] European Electronic Communication Code – EECC- Directive (EU) 2018/1972),

[3] Regulation 2017/1128 of 14 June 2017 on cross-border portability of online content services in the internal market.

[4] https://ec.europa.eu/digital-single-market/en/news/digitalyou-digital-culture

[5] https://ec.europa.eu/digital-single-market/en/policies/digital-cultural-heritage

[6] Mainly two Regional Roaming Agreements (RRA) i) the Western Balkans RRA replicating for the 6 WB countries EU roaming policies (EU acquis alignment) gradually reducing roaming charges (78% average decrease for data already achieved) with RLAH planned from 1 July 2021. ii) EaP RRA introducing a customized harmonised regime based on EU's regulatory approach gradually reducing during a 5-year transition period retail prices for consumers in the EaP region by 87%.

[7] Communication on 'Shaping Europe's Digital Future', COM(2020) 67 final and lately with the "Connect" European flagship included in the Annual Sustainable Growth Strategy 2021, COM(2020) 575 final.

which we learned to use during the lock-down, are likely to be used increasingly also when travelling in the EU. This requires sufficient quality and affordability of roaming services.

This Impact Assessment (IA) report is a follow-up to the Commission's Review report[8] adopted on 29 November 2019 (hereinafter the 2019 Review report) and the accompanying Staff Working Document (the 2019 SWD) that examined how the roaming market functions. Roaming Regulation Article 19 requires the Commission to assess the effects of the abolition of retail roaming charges and if appropriate, to present a relevant legislative proposal.

2 PROBLEM DEFINITION

2.1 What are the problems?

2.1.1 Evaluation and evidence base

The elements addressed by this Initiative have been identified in the 2019 Review report and a broad range of data (see Annex 1 Evidence base) used to evaluate how this intervention has performed and how the roaming market functions, based on the Roaming Regulation rules. The backward-looking aspects of the public consultation and the findings of the joint online surveys by the Commission and BEREC (Body of the European Regulators for Electronic Communications) held in 2018 and 2019, complement the conclusions of the roaming Review report (see Annex 2: Stakeholder Consultation).

The Review report confirms the success of the RLAH reform and the overall good functioning of the roaming market under the roaming rules. The report concludes that, despite signs of some competition dynamics on both the retail and wholesale roaming markets, the underlying basic competition conditions have not changed, and are not likely to change in the foreseeable future, to such an extent that retail or wholesale regulation of the roaming market could be lifted. In view of the adequate functioning of the safeguard rules at retail level (fair use policy and sustainability derogation), the Commission indicated that it does not intend at this stage to amend the rules laid down in the Implementing Regulation (EU) 2016/2286.

The problems identified in this section reflect the Review report findings and other evidence collected in relation to:

i) the need to revise wholesale caps with a view to ensuring sustainable provision or retail roaming services;
ii) the potential to enhance genuine RLAH experience to end-users not only in terms of price but also addressing issues related to quality of service, access to emergency services and calls to value added services;
iii) the potential to clarify access to all network technologies and generations, the possibility to avoid fraudulent generation of traffic towards international numbers and facilitate innovation.

For further details on these findings, see evaluation elements presented in Annex 6.

At present, up to almost **170 million European roaming customers enjoy RLAH**[9]. If Roaming rules are not prolonged and if further problems identified in the Review Report are

[8] Report on the review of the roaming market, COM(2019)616 final, and SWD(2019)416 available here.
[9] Based on the data collected in the International Roaming BEREC Benchmark Report, in Q3 2019 (i.e. July-September 2019), almost 170 million Europeans roamed abroad to another EU/EEA member state and enjoyed the benefits of RLAH. They generated a total of more than 6.4 billion minutes of voice traffic, more than 2.1

not addressed, end-users would risk losing benefits of **staying connected, like at home, while travelling in the EU/EEA.** This would lead to lost benefits and lost consumer surplus linked to the roaming rules (See counterfactual analysis in Section 3.3. on EU added-value and Annex 4B). In light of these risks, the no-regulation option has been discarded (see section 5.3). Consumers are now used not to restrain their roaming consumption, as confirmed by the Eurobarometer[10] and the public consultation (See section 3.2 and Annex 2).

2.1.2 A. Problems to ensure sustainable provision of RLAH

A.1 Current wholesale measures might not be sufficient to render RLAH sustainable for all operators

Driver	Problem	Consequences
• Market failures Competition Dynamics • Regulation failing to address Innovation driven needs of traffic increase • Regulatory failure – no national solution possible due to cross-border nature of roaming	Wholesale measures might not be sufficient to render Roam-Like-at-Home sustainable for all operators	• Some Operators have no or very low wholesale revenues and are obliged to pay much higher wholesale rates, compared to the average operator. • Unsustainable Operators are likely to use derogations. Then, some of their subscribers will not enjoy the full RLAH benefits. • In their efforts to contain wholesale costs, operators might chose to limit quality of services. Therefore, it acts as a driver to problem A.1.

The main problem to be addressed in this review is the need to avoid the risk of an increasing number of operators facing sustainability challenges and therefore possibly being obliged to make recourse to derogations to the prohibition of levying roaming surcharges, which would in turn limit the possibility for their consumers to fully benefit from RLAH. RLAH is only possible with wholesale rates which support the provision of roaming services at domestic price level. Consequently, the roaming regulation has lowered and capped the rates. Capped wholesale rates reduce the risk of operators facing a negative roaming margin exceeding their domestic profit margin by 3%, which would make them eligible for requesting derogation to RLAH in case of sustainability problems. In addition to capped wholesale rates, sustainability of the RLAH is ensured through safeguard rules on fair use policies and a possibility for derogations to tackle the unlikely situation where the provision of RLAH is not deemed sustainable[11].(See Annex 7: How roaming works).

Figure 4. Functioning of the roaming services

billion SMSs and more than 240 million GB of data traffic that were not subject to any kind of roaming surcharge.

[10] In 2018 a large majority (69%) of consumers declared that they benefited or think that they or someone they know benefits or will benefit from roaming rules (Flash Eurobarometer 468, 2018).

[11] A negative roaming margin of 3% is used in the current roaming rules as a threshold justifying a request for sustainability derogation. The derogation, granted by the national regulatory authorities on operator's request, allows the application of a small surcharge.

As explained in section 1, the roaming customer connects to the visited operators to use mobile services (calls, SMSs, access to data). The visited operator charges the home operator for this service (wholesale charge) while the home operator in turn charges the subscriber (retail charge). The RLAH rules have abolished the retail surcharge. (See Annex 7: How roaming works).

The main problem that the regulation needs to address is striking a balance between ensuring cost recovery for operators providing wholesale inbound[12] roaming services and minimizing sustainability challenges for outbounder[13] operators and MVNOs. The possibility of *negative economic consequences for certain operators* of the roaming rules is also linked to the need to have an intervention that is limited in time (see Section 7.3. on proportionality).

The rapid increase in roaming traffic (especially data**)** intensifies sustainability challenges, especially for operators that cannot balance their roaming costs with wholesale roaming revenues. Operators with low countervailing power (typically MVNOs and small MNOs with very little inbound wholesale traffic) get very low discounts (or no discounts at all) and thus have to pay wholesale rates that are close or at the level of the wholesale price caps. The Commission services have analysed the sustainability of providing regulated retail roaming services over the 6-year period 2020-2025 (see Annex 4). The analysis utilizes operator data collected by BEREC to forecast inbound and outbound roaming traffic and estimate revenues and costs for home operators. According to the sustainability analysis, with current wholesale caps, already in 2023, 27% of roaming providers are likely to have a negative roaming margin equivalent to 3% or more of their domestic margin.

This may lead to an increased use of sustainability derogations, therefore preventing an increasing number of EU citizens to enjoy the full benefits of RLAH. The operators that are at

[12] An inbounder operator has a customer base which consumes less mobile services abroad than those consumed by the partner operators' customer base on its own network.

[13] An outbounder operator has a customer base which consumes more mobile services abroad (i.e. on the networks of partner operators in other EU/EEA countries), than those consumed by the partner operators' customer base on its own network (i.e. when acting as a visited network).

higher risk of sustainability challenges are the ones coming from "outbound" countries where the traffic imbalances are higher, as they are both unable to rely on inbound roaming revenues and also serve large volumes of outbound roaming to retail roamers, which RLAH prevents them from charging for.

Figure 5. Map of in- and outbounder countries

The regulated price caps have been necessary to bring prices down on the wholesale roaming market. The 2019 Review report showed that at wholesale level, since RLAH was put in place, the sharp reduction in price caps has resulted in actual wholesale roaming prices below the price caps (see 2019 Review report and Annex 5: Baseline). The price caps have continued to act as benchmark prices in wholesale roaming negotiations. Any discount on the wholesale roaming market is made from these reference prices. However, most MVNOs and some smaller MNOs without multinational presence and with large outbound roaming imbalances are often unable to negotiate rates significantly below the cap, as exemplified in the Review report and in the public consultation, where 3 out of 4 MVNOs report paying wholesale prices at or slightly below caps level and only 1 out of 4 reports paying significantly below caps level. On the other hand, almost half of the MNOs (46%) report paying significantly below caps for voice and more than half (60%) report paying significantly below caps for data. Less than 1 out of 3 and 1 out of 4 report paying slightly below caps for voice and data, respectively.

The 2019 Review Report concludes that the adequacy of wholesale roaming caps needs to be assessed, but it indicates that both safeguard rules at retail level (fair use policy and sustainability derogation) have worked generally well. Therefore, the Commission does not intend to amend the rules laid down in the Implementing Regulation (EU) 2016/2286. In the absence of fair use policies, sustainability would worsen, both the number of operators with negative roaming margin and the level of negative margins would increase.

According to the Staff Working Document on the findings of the review of the rules on roaming fair use policy and the sustainability derogation (the CIR SWD), the vast majority of operators (86% in total but 95% of MNOs) have been applying a fair use policy. Also according to the CIR SWD, the majority of operators (more than 70%) who have used each fair use policy perceive it as effective or partially effective. Despite the widespread use of fair use policies, the traffic subject to fair use surcharge is limited. According to data collected by BEREC for the International Roaming Benchmark Report, it does not exceed 4% of total

roaming traffic for voice and 6% for data. At the same time, the number of sustainability derogations exhibit a declining trend. According to the 7th BEREC Report on Transparency and Comparability of International Roaming Tariffs, in the period from 31 August 2018 to 31 August 2019, NRAs granted 24 sustainability derogations. Furthermore, as the 2019 Review report concludes, operators that have obtained sustainability derogation have been using it in general with parsimony. As shown in the 2019 SWD, voice and data traffic subject to derogation in the EU does not exceed on average 3% and 1.5% of total roaming traffic respectively. Furthermore, the only country, where voice or data traffic subject to derogation exceeds 12% of total roaming traffic is Lithuania.

2.1.3 B. Limitations to ensure a genuine Roam-Like-At-Home experience for end-users

While high roaming prices have been addressed by the current regulation limitations still persist **from the end-user perspective** (see further details in Annex 5).

B.1. Low perceived quality of service and information failure on quality of service and Roam-Like-At-Home

Driver	Problem	Consequences
• Regulatory failure - no national solution possible due to cross-border nature of roaming and • Regulation failing to address Innovation driven needs	Low perceived quality of service and information failure on quality of service and RLAH	Roaming customers experience inadequate RLAH, with additional restrictions not foreseen in the Roaming Regulation.

In order to have a genuine RLAH experience end-users should be able to use the service they pay for while roaming as at home. Quality of services (QoS) is already an integral part of the price-regulated roaming service. The Roaming Regulation only implicitly requires that the end-user has access to the same service abroad in the EU/EEA for the same price, as long as such services can be delivered on the visited network. This has caused uncertainty and inconsistency in the market, even if some NRAs already intervened based on this understanding. For these reasons, the 2019 Review Report concluded that regulatory intervention is necessary to clarify the obligations on the providers related to QoS while roaming and to increase transparency.

As regards QoS, there are three underlying factors to define the problem. Firstly, there is evidence that roaming customers in some cases experience lower QoS than domestically. Secondly, there are indications that some operators have difficulties to ensure access to certain network technologies. Thirdly, in the future QoS will be an increasingly important element of the mobile service offer and there is a need to ensure a future proof regulatory framework for consumers and operators. With 5G services, it might become increasingly important for consumers to know if they will be able to use certain applications and services while roaming due to QoS limitations. Operators should be enabled to offer to end-users the same QoS as they offer at home. The last two factors defining the problem are described in section 2.1.4 C on limitations in addressing innovation needs and access to all network technologies and generations from the operators' perspective.

Insufficient transparency as regards quality of service (QoS) while roaming may lead to insufficient clarity for consumers. The Roaming Regulation does not include any explicit obligation neither in terms of QoS level nor in QoS transparency. However, it mandates that the end-users have access to the same service while travelling in the EU as long as such

service can be delivered on the visited network. *Low perceived quality:* Available data indicates that QoS indeed is sometimes limited while roaming. BEREC data confirms cases where home operators offered 3G even when 4G was available. Results of a Joint Research Center (JRC) roaming study on QoS[14] also confirm this. Analysis of these results shows that at least in 13 cases the roaming customers had lower QoS than at home and in 15 cases frequently lower QoS compared to other roaming customers on the visited network. 6 of these roaming customers had worse experience in both respects. This indicates that in these 6 cases out of 29, the offered QoS was limited in comparison to what other roaming customers could achieve. Furthermore, 21 customers from 11 Member States at least once had worse roaming experience than at home and worse experience than what was technically possible on at least one of the networks that they visited. For further evidence of the limitations, see Annex 5: Baseline.

In its Opinion on the roaming market[15] (hereinafter 'BEREC Opinion'), BEREC notes that domestic operators should not deliberately lower the QoS compared to what is offered in the home country.

Transparency: The Roaming Regulation includes an obligation on the domestic provider to ensure that a contract includes the main characteristics of regulated retail roaming service provided. QoS is not listed as one of the parameters that should be specified.

The 2019 Review report concluded that transparency on QoS is not sufficiently ensured in the provision of retail roaming services. According to BEREC, operators in 23 countries do not provide information on their websites about the QoS while roaming.[16]

B.2. Information failure regarding higher prices for value added services

Driver	Problem	Consequences
Regulatory failure – no national solution possible due to cross-border nature of roaming	Information failure regarding higher prices for value added services	- Roaming customers suffer from inadequate RLAH, with additional restrictions not foreseen in the Roaming Regulation. - Bill-shock - Restricting use of roaming services

Calls to certain numbers involve different fees because they provide 'value added services' (VAS)[17] in addition to the mere electronic communications service: for example, free commercial numbers to subscribe to an insurance service, or a paid number to a technical helpdesk. These VAS numbers can generate additional costs when roaming compared to the cost at home; customers can get blocked, or they may face bill shocks. The Roaming Regulation does not specifically address the use of VAS while roaming. Lack of transparency and high surcharges for VAS are not only related to roaming but also to national circumstances. This limitation is however often larger in roaming scenarios.

[14] JRC quality of service study, SMART 2018/0011.
[15] BEREC Opinion on the functioning of the roaming market as input to EC evaluation, BoR(19)101, 19 June 2019, available here.
[16] See also BEREC Transparency and comparability report data in Annex 5: Baseline and in the.
[17] Value added services refer to communications related to premium-rate numbers, freephone numbers and shared cost numbers, see glossary for more details.

On retail level, insufficient transparency on the higher charges applied to calls to VAS numbers and the resulting bill-shocks might erode customers' confidence in roaming, and may reinforce restricted phone use abroad.

The joint Commission-BEREC online survey 2020 shows that 26.5% of the responding operators report having received complaints from their clients about communications related to VAS while roaming in the EEA. Some complaints concerned significant bills (several hundred euros per case) and unexpectedly high compared to domestic charges for the end-user.

B.3. Failure to provide access to emergency services, as provided domestically

Driver	Problem	Consequences
- Regulatory failure – no national solution possible due to cross-border nature of roaming and - Regulation failing to address Innovation driven needs	Failure to provide access to emergency services in the same way as is done domestically	- Roaming customers cannot enjoy similar level of access to emergency services as at home. In a situation of crisis, roaming customers can be in a substantially inferior position than at home. - This is particularly the case for disabled end-users and prepaid end-users that have exhausted their credit.

In their home country, end-users with disabilities and other end-users can use alternative means of access to emergency services instead of voice calls[18] (e.g. SMS or apps) while also benefitting from caller location. While roaming, access to emergency services through alternative means of emergency communications or caller location is not ensured for them[19]. Even if such access were ensured, it may not be free of charge as required by the EU law for accessing emergency services domestically. The competence of a national law of the visited country does not extend to other countries to solve this issue.[20]

Furthermore, caller location information is not provided consistently for all roaming end-users placing an emergency call. In particular, the very accurate handset-derived location solution that is being successfully deployed in the EU is not available for roaming end-users free of charge as for the national end-users of the visited network. Home operators tend to charge alternative means of access to emergency services at retail level also because of the undifferentiated treatment at wholesale level of the various types of traffic (IP data, SMS).

While the Roaming Regulation ensures that end-users are informed about the cost-free call to "112" when entering another Member State, there is no equivalent provision for alternative means of access to emergency communications. Roaming customers with disabilities are not informed about how to contact emergency services when travelling in another Member State. Relevant EU level associations confirm that the lack of awareness on the means of access to

[18] Real time text, total conversation, SMS, emergency applications, web services, relay services. As defined in Article 2 EECC: (35) 'total conversation service' means a multimedia real time conversation service that provides bidirectional symmetric real time transfer of motion video, real time text and voice between users in two or more locations. Currently real time text is mandated in the Accessibility act for disabled end-user as of 2025.

[19] Access to emergency services ensured by the European Electronic Communication Code in particular Article 109(2).

[20] According to the latest replies to a COCOM questionnaire. These responses feed into the report to the European Parliament and the Council that has to be submitted by the Commission by 21 December 2020 pursuant Article 109(4) EECC.

emergency services represents a real bottle-neck to the ability to contact emergency services in the visited country. In the public consultation, the majority of answers (76%), including representative NGOs and three public bodies, indicate the total lack of awareness on the alternative means of access.

2.1.4 C. Limitations to ensure access to all network technologies and generations, facilitate innovation and avoid misuse from the operator perspective

C.1. Limitations in addressing innovation needs, ensuring quality of service to end-users while roaming and access to all network technologies and generation for operators

Driver	Problem	Consequences
- Regulatory failure – no national solution possible due to cross-border nature of roaming - Regulation failing to address Innovation driven needs	Limitations in ensuring quality of service to end-users while roaming and not ensured access to all network technologies and generations for operators Technological developments and tariff structures not foreseen by the roaming regulation	- Roaming customers suffer from inadequate RLAH, with additional restrictions on Quality not foreseen in the Roaming Regulation. - Need for clarification on connectivity for machine-to-machine

Pursuant to Article 3 of the Roaming Regulation, mobile network operators shall meet all reasonable requests for wholesale roaming access, which should cover access to all network elements and associated facilities, relevant services, software and information systems, necessary for the provision of regulated roaming services to customers.

While the vast majority of operators (97%)[21] claim that they do not limit the QoS/data speed of roaming services to 3G for their customers, BEREC data confirms that 43% (68 mobile operators) offered 3G roaming services even when 4G was available.[22]

There are indications that some operators have difficulties in ensuring access to certain network technologies. This is a precondition for them to be able to offer certain levels of QoS while roaming. In particular, this is important for new technologies.

While 46% of the respondents to the public consultation consider that the current wholesale roaming access obligation is sufficient to ensure access to 4G and 5G, 31% of the respondents do not think that the current obligations are sufficient. In particular MVNOs note that they have experienced long delays in being granted access to 4G networks and fear potential bottlenecks on 5G roaming. Some stakeholders also argue that the current regulation does not take sufficiently into account technological evolution, such as 5G services. There is an inherent risk that access to modern technologies may be limited by visited networks.

In the future QoS will be an increasingly important element of the mobile service offer and there is a need to ensure a future proof regulatory framework for consumers, businesses and operators.

While innovative services are leading to an increase[23] in wholesale access requests for machine-to-machine[24] (M2M) communications, market players are asking for more explicit

[21] See the joint BEREC-Commission Survey 2020 (Annex 4).
[22] See the BEREC transparency and comparability Report 2019 BoR (19) 235, p. 25

rules or guidelines governing access requests for permanent roaming for the purposes of connectivity for M2M/Internet of Things (IoT). Indeed, connected machines have emerged recently: GSMA[25] describes[26] that unlike the mature voice/data business from standard customers, many M2M/IoT applications and services are still being defined. It has also to be noted that there exist many non-cellular technologies that are not regulated and compete with cellular ones. It has been estimated that cellular connections account for only 14% of all IoT connections[27].

The majority of MNOs and a small number of MVNOs offer M2M services. However only 1 out of 2 MNOs and 1 out of 4 MVNOs seek to establish specific agreements for M2M[28]. Even though now NRAs are aware of very few ongoing negotiations[29], we expect the market to grow with technology evolution and to develop with voluntary agreements, since operators often have an interest to host M2M communication traffic on their networks, including on permanent basis, in order to benefit from the related wholesale revenues (See Annex 6: Review Report evaluation).

The Roaming Regulation does not exclude M2M from its scope and the relevant wholesale roaming access obligations, however operators consider that the current, volume based charging model is not suitable for covering network costs like signaling and location updates, in view of the very low data volumes in M2M communications. According to information available, GSMA is considering alternative charging models for M2M communications, involving potentially a charge per SIM per month. Operators should be able to establish flexible roaming agreements, enabling wholesale roaming services, applying tariff schemes, which are not based on the volume of consumed data but on alternative schemes. There is a need for clarification of the possibility to use alternative, non-volume based tariff structures.

C.2. Difficulties in addressing cost of VAS and combating fraud and misuse

Driver	Problem	Consequences
Regulatory failure – no national solution possible due to Cross-border Nature	Difficulties with cost of VAS and in combating fraud and misuse	Operators face higher costs

[23] WIK Consult estimates that the number of M2M subscriptions in the EU-28 will approach 1 billion in end of 2026 (see Annex 8), while Ericsson forecasts a large 15% growth of IoT connections every year until 2025 at least. Source: Ericsson mobility report 2020, p.23. - https://www.ericsson.com/en/mobility-report/reports/june-2020

[24] M2M unlike interpersonal communications service (defined in Article 2(5) of the European Electronic Communication Code – EECC- Directive (EU) 2018/1972), these are exchanges of information between machines that involve limited direct interpersonal and interactive exchange of information between natural persons.

[25] GSM Association, commonly referred to as 'the GSMA' or Global System for Mobile Communications, is an industry organization that represents the interests of mobile network operators worldwide.

[26] GSMA response to EC Public Consultation 2020.

[27] Ericsson mobility report 2020, p.23. - https://www.ericsson.com/en/mobility-report/reports/june-2020

[28] BEREC Survey 2020 (see Annex 2).

[29] BEREC survey 2020 (see Annex 2).

In the BEREC opinion two difficulties concerning calls to VAS numbers were identified: (a) the lack of transparency concerning VAS number ranges and wholesale tariffs and (b) the fraudulent generation of traffic towards international numbers with high termination rates subject to revenue sharing between the operator terminating the call and the value added service provider. These difficulties became more important with the introduction of RLAH and have caused and are causing losses for operators.

Operators typically face higher wholesale roaming rates for calls to VAS, since the regulated rates apply only to the connection but not to the whole tariff that is charged for VAS. Due to the lack of transparency, numbering ranges for VAS often cannot be recognised by an operator, leading to unexpected costs incurred upon reception of wholesale roaming bills. Trying to recover these extra costs at retail level leads to consumer complaints, often forcing operators to absorb any extra wholesale costs from calls to VAS. This situation differs from the typical case of domestic calls, where the issue mainly focuses on calls to premium rate services (and more generally numbers with high termination rates). In the case of roaming however, the higher charges may be caused by all types of VAS, including freephone, shared cost and short codes (except 112).

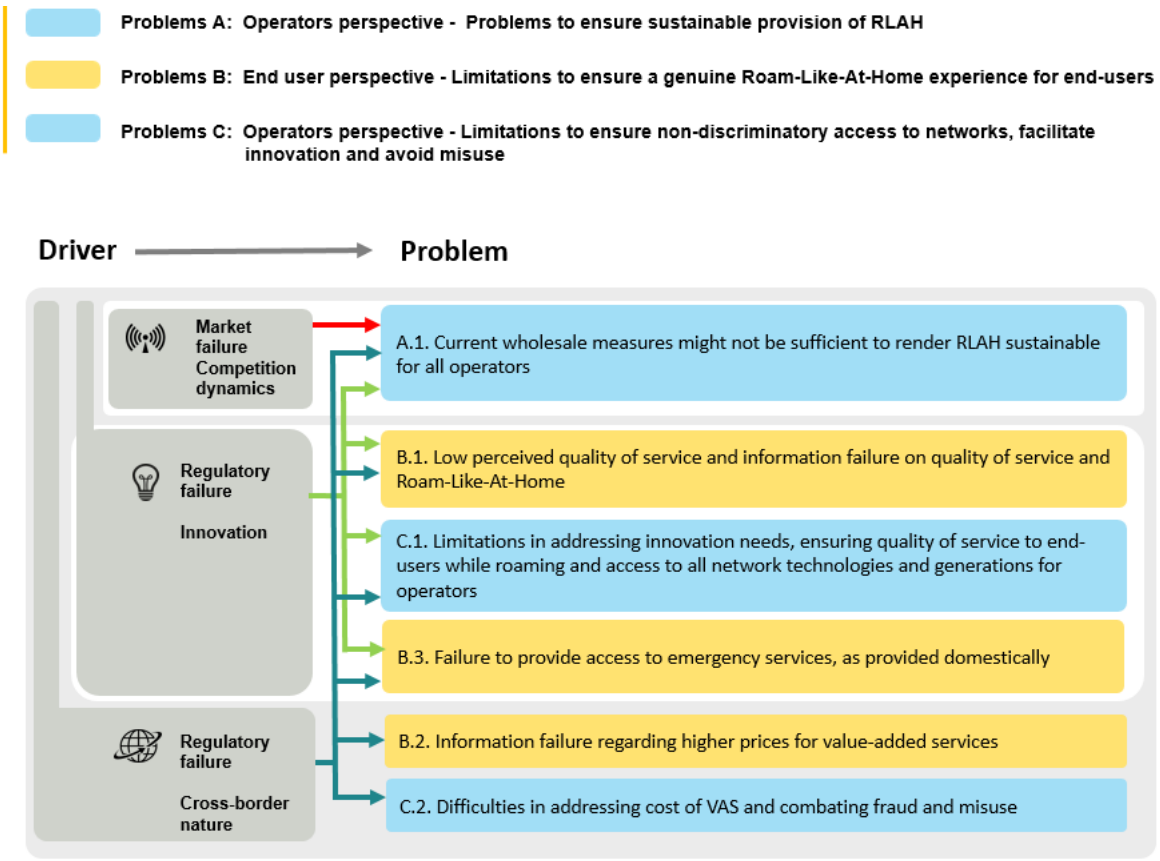
Revenue sharing fraud, i.e. the artificial generation of traffic towards international destinations is the most common case of fraud, described in the interim report and the BEREC Opinion. While revenue sharing fraud is not specific to roaming, it is exacerbated in a roaming context. The home operator has the contractual relation with the end-user making the call, but in a roaming scenario it is the visited network that connects the calls and hence the home operator does not have control over the treatment of the VAS call.

While these are two distinct problems, any measure that increases transparency of high termination rate number ranges may contribute to mitigating the revenue sharing fraud difficulties. See Annex 5 Baseline for further evidence on the problem.

2.2 What are the problem drivers?

The analysis of the evidence supporting the impact assessment identified I) Market failure and insufficient competitive dynamics on the roaming market; II) Regulatory gap linked to the cross-border nature of roaming and III) Regulatory gap in addressing technological development and innovation as main drivers contributing to the problems related to roaming. The remaining part of section 2 describes these drivers.

Figure 6. Intervention logic (drivers-problems)



2.2.1 Driver I: Market failure and insufficient competitive dynamics on the roaming market

Before the Roaming Regulation, operators charged wholesale prices much above the actual incurred costs and transferred these high costs to the consumers, through equally high retail prices. Operators had very little incentive to compete for low roaming-retail prices and consumers overall seemed to take retail roaming prices as given and less relevant for their choice of domestic mobile subscription. Accordingly, no wholesale competition was observed before the caps on wholesale roaming were implemented and lowered.

The situation in neighbouring regions confirms that without roaming rules, market dynamics are insufficient to reduce roaming surcharges and to bring wholesale rates closer to costs. For example in the Western Balkans (WB), the level of roaming retail and wholesale prices incentivised decision makers from the region to introduce an EU-based approach via a Regional Roaming Agreement[30] enabling them to reduce roaming charges in the six countries of the region. In Switzerland, despite some efforts to incentivize operators to reduce roaming charges, no widespread reduction has been observed. Also rest of the World (RoW) roaming prices are an indicator of market failure. According to operator data, collected for the BEREC international roaming benchmark report, average wholesale rates charged by EU operators are 5x higher for voice and 4x higher for data, and EU customers roaming in the rest of the world pay surcharges of 50 cent/min for voice and 28 €/GB for data.

[30] On 1 July 2019, the Western Balkans regional roaming agreement entered into force. It will have a gradual reduction of the roaming charges within the region and Roam like at home will be introduced from 1 July 2021. Already from July 2019 the tariffs were significantly reduced, on average, prices for outgoing calls were lowered by 65% and for data transfer there were a 78% decrease.

Identified market failures in the wholesale roaming market:

Wholesale roaming rates are agreed in biannual **bilateral negotiations** between "un-equal" contractors. Apart from size and multinational reach, the main driver in these negotiations is the capacity of each operator to exchange traffic, i.e. to balance their retail-outbound traffic they buy with the wholesale-inbound traffic they can serve. This means that there are operators with a weaker negotiation position due to no or little inbound traffic to balance off. Those operators are MVNOs or MNOs with large outbound balance, especially when they are small and not part of a multinational group, and are consequently unable or seriously impaired to negotiate better conditions than those in the cap (see also Annex 3 and Review Report).

In addition, national wholesale markets are by nature **oligopolistic** as only MNOs can offer roaming services in visited market[31]. This situation creates low competitive pressure and has not changed drastically, as confirmed by the study on technological developments and roaming[32]. (See Annex 8 for details).

Wholesale prices provide further evidence that competition remains imperfect. While they are generally charged well below wholesale caps across Member States, there are differences in the wholesale rates charged between Member States[33], which can be the result of different underlying costs and/or different competitive environments. At the same time, a number of operators still actually pay wholesale prices at the level of the wholesale cap. So, operators with weaker negotiating power are often obliged to pay prices at or close to the wholesale caps[34].

Market failures in the retail roaming market:

A significant proportion of end-users has a limited interest in the actual retail cost of using roaming services when deciding on a domestic mobile subscription, as roaming is only used while travelling. According to a Eurobarometer survey of May 2018, only 46% of respondents had travelled at least once to another EU member state in the past 12 months and only 28% had travelled more than once.[35] The regulatory framework for the sector includes provisions to facilitate consumers in making informed choices when choosing or changing operators, through an increased level of transparency of information and specific rules on maximum contract duration and one-day number portability[36]. Despite this, mobile end-users do not switch operator only based on roaming related considerations but rely largely on the domestic offers and how these compare. Before introduction of RLAH[37], the domestic offers

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[31] Typically, each MS has 3-4 MNOs and among those, often not all of them can provide a full range of services (such as full geographic or services coverage) needed to provide services to all roamers. All failures were already presented in SWD (2016) 202 final (the Impact Assessment for Regulation 2017/92 amending Regulation (EU) 531/2012 as regards rules for wholesale roaming markets) and all persist.

[32] SMART 2018/12 Technological developments and roaming" by WIK Consult, July 2019, available here

[33] According to BEREC's International Roaming Benchmark Report, in Q1 2019 the average wholesale price for voice and data was respectively 55% and 35% of the wholesale cap. When looking at the price charged per operator, 3 out of 4 of operators charge on average up to 72% of the wholesale voice cap and up to 60% of the wholesale data cap.

[34] The established caps must balance ensuring cost recovery for the visited network (supplying the wholesale service) on the one hand, whilst at best possible reducing the cost to the home operator (buying the wholesale service), as RLAH prevents the home operator of charging the retail customer for the used roaming services.

[35] See details in the staff working document accompanying the Impact Assessment for Regulation 2017/92.

[36] Directive (EU) 2018/1972 establishing the European Electronic Communications Code.

[37] With RLAH, operators are in principle not allowed to charge for retail roaming services. End-users would not (and should not) take the prices for retail-roaming into account when choosing a domestic subscription and

between operators mostly did not differentiate on retail roaming prices but focused rather on domestic offerings.

As a result, retail roaming prices were excessive prior to the Roaming Regulation. These market failures without regulation are further exemplified when looking at retail roaming prices in the rest of the world (outside the EEA) as retail roaming charges for consumption in non-EEA countries remain excessively high.[38]

Some technological developments such as over-the-top (OTT) voice and messaging services, WiFi and eSIM, could exercise competitive pressure to retail roaming services as analyzed in the study on technological developments (SMART 2018/12, see Annex 8). However, while each of the technologies can exercise some competitive pressure, they all face substantial constraints that greatly limit their ability to act as substitutes to retail roaming services in the medium term.

2.2.2 Driver II: Regulatory failure linked to the cross-border nature of roaming and inability to solve it nationally

In the national settings, national regulatory authorities (NRAs) are responsible for safeguarding and promoting the interests of end-users. However, the NRAs are not able to control the behavior of the visited network operators, situated in other Member States, on whom those customers depend when using international roaming services. This "jurisdictional" obstacle diminishes the effectiveness of measures taken by Member States based on their residual competence to adopt consumer protection rules.

In the past, international roaming was one of the markets susceptible to ex-ante regulation, defined in the Commission Recommendation of 11 February 2003 on relevant product and service markets. However, it was not possible for national regulatory authorities to effectively regulate roaming services as the regulatory powers under this specific framework relies on identifying undertakings with significant market power, which was not possible for the NRAs to do, given the international and cross-border nature of roaming. Only the introduction of common Union-wide roaming rules enabled to address the market failure and the retail and wholesale prices started to decrease.

2.2.3 Driver III: Regulatory failure in addressing Innovation, technological and market developments

While constant innovation in the telecoms sector is welcomed and brings benefits for end-users, it also comes with challenges to the existing regulatory measures. Technological developments bring changes to available network generations and commercial offers, which have the potential to disrupt the end-users' needs and tariff structures in a way not foreseen by the applicable regulation, creating regulatory gaps.

Consequently, commercial roaming arrangements reflecting current rules on wholesale roaming access (Art. 3 Roaming Regulation) might not be sufficient to address needs linked to innovation and technological developments.

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hence one cannot rely on for example the elasticity of roaming retail prices (as this has a marginal price by definition of zero, unless a derogation has been approved or the end-users consumes beyond the FUP.

[38] As a reference, European incumbents charge anything between 500 and 15.500 euro per gigabyte of data used outside of EU.

Innovation drives consumers' needs as regards QoS. 5G is a technological step change for mobile services and it is expected that certain services and applications will require 5G technology. In particular, the deployment of 5G networks and services is expected to enable internet access services with different levels of QoS (QoS classified connections), and specialised services. Lack of effective measures to ensure that operators can gain wholesale access to all network generations and related facilities on equal terms might prevent the users to use innovative services and applications that require 5G connectivity and higher QoS, not only at home but also while roaming.

Technological developments also drive consumers' needs as regards emergency communication. In particular, the migration from circuit switched solutions (essentially calls) to IP solutions, triggers the need to ensure accessibility and free of charge use by consumers when these solutions are deployed in EU jurisdictions (see relevant problem in Section 2.1.).

Innovation also drives increase in data volume needs, with widespread use of data-heavy applications and services that we might witness in particular with the development of 5G. This trend might create an increase in roaming data consumption that might exacerbate sustainability problems for operators, that need to be addressed through further regulatory measures (see problem B1 Section 2.1). Expected increase in data volumes are considered in the sustainability model, and impacts of possible higher data increases are assessed via the sensitivity scenarios as presented in Section 6 and Annex 4A.

Innovation drives an increasingly important M2M communication market, where we register an exponential increase in the number of Internet of Things (IoT) devices, which often involves permanent roaming. The 2019 Review report notes that the Roaming Regulation does not exclude M2M communications from its scope and that wholesale roaming access obligations apply in case such access is sought for the purposes of M2M communications. It further acknowledges that the relevance of volume-based maximum wholesale charges for low-volume, narrow-band M2M communications requires further attention. M2M often requires the use of roaming services on a permanent level. Although the Roaming Regulation does enable alternative wholesale tariff structures between operators, there is an inherent risk that the measures in place which are foreseen to eliminate the negative effects of permanent roaming, in turn acts as a hindrance to M2M, as confirmed by BEREC.

2.3 How will the problem evolve?

As regards the **possible impact** of technological developments **on roaming services**, a study on technological developments and roaming has considered developments which could impact competition in wholesale and/or retail roaming markets over the medium term (5-10 years). In particular, it has examined the following developments[39]:

(i) Developments which enable end-users to **bypass data roaming or roaming calls** and SMS by using **alternative technologies to traditional mobile**: Wi-Fi and Wi-Fi aggregation services; Over-The-Top (OTT) services; and Rich Communication Services (RCS).

(ii) **Technological developments and platforms** which could facilitate competition in mobile roaming and cross-border connectivity: Virtual SIM (VSIM); Embedded SIM (eSIM), 5G and 5G network slicing; Voice over LTE (VoLTE); Internet of Things (IoT); Wholesale trading negotiating platforms; and Local data break-out.

[39] See Study SMART 2018/0012 "Technological developments and roaming" by WIK Consult, July 2019, available here performed for the roaming review in 2018-2019.

(iii) **New business models and players** entering the roaming space: Multi-MVNO agreements and cross-border MVNOs; entry of equipment, content and service providers into the roaming space.

The study acknowledges that some of the technologies above could exercise a certain competitive pressure on the rates charged for roaming wholesale, especially OTT voice and messaging services and to a lesser degree eSIM and (especially for IoT) 5G and network slicing. However, it concludes that there is no case for significant changes to the regulatory rules applying to international roaming under the current review (without prejudice to review of maximum wholesale rates). These conclusions are confirmed by operators' responses to the Joint Commission-BEREC online survey 2020 and the public consultation (See Annex 2).

A: How problems from the end-users' perspective would evolve

Section 5.1.2 further describes end-user rights related to QoS, emergency services and VAS and indicates the European Electronic Communications Code provisions on contract information, transparency, QoS and emergency communications that will affect consumers rights in a roaming environment.

If an operator is not able to negotiate a roaming wholesale agreement covering the latest technology, their end-users will have access only to 4G, also when they roam in areas where 5G is available for domestic users (see limitations in sufficient QoS to consumers as at home in Section 2.1). This could limit end-users from fully profiting the possibility to use 5G and IoT mobile services, for example services connecting vehicles and road infrastructure, which would limit his possibility to avoid congestion and road accidents.

As regards emergency communications, the evolution of 5G networks and the obligations of the European Accessibility Act[40] that provide for simultaneous text and video as the emergency communication for disabled end-users (total conversation[41]) will further increase the need for end-users with disabilities to be aware of means of access and to be ensured free of charge use when roaming.

B: How problems from the operators' perspective would evolve

As regards sustainability of RLAH for operators, if wholesale caps are retained at 2022 levels, we can expect that wholesale prices will slightly decline, roughly in line with the current reduction in wholesale rates for voice calls.[42] However, operators that currently pay wholesale rates close or at the level of the wholesale caps will most likely not benefit from such reductions. This will happen for the same reasons why they have not benefitted from such reductions so far, i.e. their lack of negotiating power. As a result, MVNOs and small MNOs

[40]Directive (EU) 2019/882, Annex 1, section IV(a) : (a) Electronic communications services, including emergency communications referred to in Article 109(2) of Directive (EU) 2018/1972:
(i) providing real time text in addition to voice communication;
(ii) providing total conversation where video is provided in addition to voice communication;
(iii) ensuring that emergency communications using voice, text (including real time text) is synchronised and where video is provided is also synchronised as total conversation and is transmitted by the electronic communications service providers to the most appropriate PSAP.

[41] Art 2(1)(35) EECC: 'total conversation service' means a multimedia real time conversation service that provides bidirectional symmetric real time transfer of motion video, real time text and voice between users in two or more locations.

[42] In this regard, please note that the cost model used by the Commission services indicates a continued downwards trend in costs for providing roaming wholesale services. Therefore, it is reasonable to consider whether these caps should be revisited (for more, see Annex 4).

with limited inbound traffic will continue to pay wholesale rates close or at the level of the caps. This, coupled with the continuous **increase in retail roaming data volumes**, is expected to lead to a steady reduction in their sustainability, forcing them to resort to sustainability derogations. For further details see section 5.1.2 on the baseline description also including indications on the possible impact of COVID on roaming volumes.

As regards QoS, the difficulties linked to prolonged negotiation for the access to all technology generations in wholesale roaming agreements might increase with the introduction of 5G, as confirmed by some operators in the public consultation.

As regards M2M, The deployment of 5G networks and services, and especially the development of use cases based on M2M/IoT is expected to have a deep impact in international roaming. The provision of M2M connectivity services or IoT services will require upgrading current roaming agreements to 5G, taking into consideration specific quality characteristics. In practice, commercial voluntary agreements should be able to address this emerging need. In case there would be a future unwillingness on the part of MNOs to conclude such agreements (as host networks), this may impede the development of the M2M/IoT market as well as that of the 5G market.

As regards VAS, numbering ranges are set in the national numbering plans of the Member States and are not harmonised at EU level. Operators may therefore not be able to recognise the numbering ranges for VAS in all countries in advance, which leads to unexpected additional costs incurred upon reception of wholesale roaming bills. Currently, in the case of many VAS numbering ranges termination rates are neither regulated at EU level, nor at national level.

As regards future evolution, it has to be noted that termination rates for VAS, which constitute only one element of the overall revenue in the case of VAS, will not be included in the upcoming delegated regulation setting maximum Union-wide voice fixed and mobile termination rates in 2020[43], therefore no changes are expected with the entry into force of the delegated act' in relation to VAS. Since in the roaming scenarios visited networks are unable to identify VAS numbers abroad in the EU, the unexpected additional costs incurred upon reception of wholesale roaming bills will persist.

3 WHY SHOULD THE EU ACT?

3.1 Legal basis

The current Roaming Regulation, which will expire on 30 June 2022, is based on Article 114 of the TFEU. This Article is the legal basis for measures adopted in accordance with the ordinary legislative procedure with the aim of establishing or ensuring the proper functioning of the internal market, an area without internal frontiers in which the free movement of goods, persons, services and capital is ensured as foreseen in Art. 26 TFEU. As the present initiative concerns the prolongation and review of the Roaming Regulation, the same legal basis should be used.

According to the case-law of the European Court of Justice, the object of measures adopted on the basis of Article 114 (ex Article 95 TEC) must be to improve the conditions for the establishment and functioning of the internal market[44]. The Union legislature may have

[44] Case C-491/01 *British American Tobacco (Investments)and Imperial Tobacco* [2002] ECR I-11453, paragraph 60, and Case C-217/04 *United Kingdom* v *Parliament and Council* [2006] ECR I-3771, paragraph 42).

recourse to it particularly where there are differences between national rules which are such as to obstruct the fundamental freedoms and thus have a direct effect on the functioning of the internal market[45] or to cause significant distortions of competition[46].

The following sections explain how the proposed review improves the conditions for the functioning of the internal market, in line with the subsidiarity requirements set by EU Law and the relevant CJEU case-law.

3.2 Subsidiarity: Necessity of EU action

In the international roaming, only action by the Union is effective as the problems could not be solved at national, regional or local level. EU action is strictly needed for the enhancing the Single Market for electronic communication. As observed by the Advocate General in the landmark case C-58/08 Vodafone, "*the differences in price between calls made within one's own Member State and those made while roaming could reasonably be regarded as discouraging the use of cross-border services such as roaming. Such discouragement of cross-border activities has the potential to impede the establishment of an internal market in which free movement of goods, services and capital is ensured. Indeed, there is no clearer cross-border activity in the mobile telecoms sector than roaming itself.*"[47]

This **cross-border character** justifies the intervention at the EU level because Member State actions cannot by themselves address the issue effectively and National regulatory authorities have accordingly been unable to autonomously tackle this problem[48].

Also the Court of Justice recognised that, in the past, "*the high level of retail charges had been regarded as a persistent problem by NRAs, public authorities and consumer protection associations throughout the Community and that attempts to solve the problem using the existing legal framework had not had the effect of lowering charges*"[54].

The proposed review includes measures both at wholesale and at retail level. In this respect in the relevant case law the CJEU had found that wholesale regulation of roaming market is compliant with the subsidiarity principle in view of the fact that "*the interdependence of retail and wholesale charges for roaming services is considerable, so that any measure seeking to reduce retail charges alone without affecting the level of costs for the wholesale supply of Community-wide roaming services would have been liable to disrupt the smooth functioning of the Community-wide roaming market*"[55].

The issues addressed by the measures included in the proposed review are strictly linked to the cross border character of roaming, and can potentially result in either discouraging the use of roaming, or creating barriers in the use of mobile services and applications while travelling in the single market, or in disrupting the smooth functioning of the EU-wide roaming market, which, also according to the relevant case law, is an objective that must be pursued and could best be achieved at EU level[49]. The reasons why MSs alone cannot tackle these problems and it is necessary an EU action are reported in section 2.2.2.

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[45] Case C-380/03 *Germany* v *Parliament and Council* [2006] ECR I-11573, paragraph 37 and the case-law cited.
[46] Case C-376/98 *Germany* v *Parliament and Council* [2000] ECR I-8419, paragraphs 84 and 106.
[47] See Opinion Of Advocate General Poiares Maduro delivered on 1 October 2009 in Case C-58/08 http://curia.europa.eu/juris/document/document.jsf?text=&docid=72636&pageIndex=0&doclang=EN&mode=req&dir=&occ=first&part=1&cid=2824416
[48] See December 2005 ERG letter to the Directorate general of the Commission's DG Information Society.
[49] C-58/08 Vodafone, CJEU judgment of 8 June 2010.

A more detailed assessment of the compliance of this proposal with the principle of subsidiarity is reported in the Subsidiarity grid, accompanying the legislative proposal.

3.3 Subsidiarity: Added value of EU action

EU level action has clear benefits as confirmed by the results of the public consultation. The vast majority of respondents (including citizens, consumer organizations, and academic institutions) strongly agree that they can enjoy the benefits that the Roaming Regulation aims to bring. 65% of respondents in all respondent groups replied that the Roaming Regulation has significantly promoted the interests of the citizens and businesses in the EU/EEA.

Based on the data collected in the International Roaming BEREC Benchmark Report, in Q3 2019 (i.e. July-September 2019), almost 170 million Europeans roamed abroad to another EU/EEA member state and enjoyed the benefits of RLAH. They generated more than 6.4 billion minutes of voice traffic, more than 2.1 billion SMSs and more than 240 million GB of data traffic that were not subject to any kind of roaming surcharge.

To size the benefits brought to consumers by RLAH we can first of all consider the huge increase in roaming volumes (see also Figure 2 in Section 1) that measures the unleashed and untapped demand for mobile consumption among travelers in the EU. Even if compared with the expected growth in roaming traffic without RLAH, the increase is exponential. Furthermore, the Commission (JRC) has performed an econometric exercise aimed at quantifying the extent to which European consumers have benefited from the implementation of RLAH, that is, the additional Consumer Surplus they got from the regulation. In brief, consumers now pay less for roaming services and use more roaming services. In this analysis, the counterfactual volume increase has been used to compute the change in the consumer surplus, which can be quantified in the range of around 5400 million euros for the 2 years after the implementation of RLAH from 15 June 2017 to 15 June 2019 (see Annex 4B for details).

As regards the impact on competitiveness of EU operators, the analysis shows that European operators are generally not hindered in their abilities to compete in the international setting as a result of RLAH.

Firstly, the analysis of the domestic revenues before and after the entry into force of RLAH reveals that, on average, the increase of domestic revenues has been around 25%[50]. A similar analysis on domestic market shares (ratio between subscribers for each operator and number of subscribers in the country) shows that market shares have not changed much within the Member States. Had certain operators been more (negatively) effected by RLAH, they could have resorted to higher domestic prices, which in turn would incentivise customers to change domestic provider. This has not been observed.

Second, the median ratio of roaming revenues over domestic revenues in 2016 Q4 (i.e. before the introduction of RLAH) was 3.3%. From this, it appears highly unlikely that a regulatory change affecting less than 3.5% of the revenues could have the potential to hamper operators' profitability overall[51]. This is further confirmed, as the structure of the European mobile market has remained mainly unchanged since 2017 with no big mergers observed or larger operators exiting the market.

[50] The analysis has been performed comparing average domestic revenues before and after the implementation of RLAH, controlling for time invariant characteristics at the operator and country level.
[51] Further underlined by the very few number of derogations of the RLAH regime received.

Third, the current global pandemic has drastically reduced the possibilities for travelling, and this resulted in heavily declining wholesale roaming revenues. Operators have indicated this as a negative impact of the pandemic, which shows that, in general, hosting roaming customers is a benefit to the operators.[52]

In addition to the above the proposed *review aims at further improving the functioning of internal market also contributing to the possibility for end-users to have a genuine "roam like at home experience" and addressing the possible obstacles to this goal.*

The added value of the different EU actions proposed in the review of the Roaming Regulation is explained in the following paragraphs:

(i) Reviewed wholesale measures aim to ensure the cost recovery for all operators and to address the sustainability challenge, thus representing the adequate balance between the needs of the different Member States (in- and outbounders) that only an EU instrument can ensure. The proposed solution aims to also ensure flexibility and a future-proof approach. Previous attempts to regulate roaming through *ex ante* regulation have not been successful and failed to provide appropriate solutions as illustrated in Section 2.2

(ii) New measures on VAS aim to establish at EU level solutions to provide single information point on the relevant VAS number ranges. Such a common solution will also enable additional transparency for roaming end-users and, in the future, more effective actions against misuse and fraud.

(iii) Introducing new measures on QoS and on access to emergency services: the value added of an EU intervention is strictly related to the cross-border nature of the underlying problems as better explained in the previous section. With regard to both kind of measures, national solutions are limited, since the QoS depends on the provided connectivity/service of the visited network.

4 OBJECTIVES: WHAT IS TO BE ACHIEVED?

4.1 General objectives

A. Ensure sustainable provision of RLAH

At wholesale level the overall objective is to ensure, through competition and regulated wholesale caps, sustainable provision of RLAH so that operators domestic pricing models are not affected. This objective is essential to the prolongation of RLAH.

This first objective aims to enhance the sustainability of RLAH while ensuring recovery of their costs by network operators (MNOs) who offer roaming at wholesale level. Ensuring cost recovery at wholesale level, preserves incentives to invest in new networks and avoids distortion of domestic competition in the visited markets. It is consistent with the European Electronic Communication Code (EECC) objectives, the regulatory framework for electronic communications, which promotes connectivity as the most fundamental building block of the digital transformation and focuses on infrastructure competition and return on investment for operators. It is also a complement to the connectivity policy[53] to accelerate rollout of 5G and

[52] See, among others, the ETNO policy note *The role of Digital Communications at the time of COVID-19: Building A Digitally-Enabled Recovery*, available here.

[53] Commission Recommendation C(2020) 6270 of 18 Sep. 2020 on a common Union toolbox for reducing the cost of deploying very high capacity networks and ensuring timely and investment-friendly access to 5G radio spectrum, to foster connectivity in support of economic recovery from the COVID-19 crisis in the Union.

fiber networks, reduce the cost of network deployment[54] and provide operators with timely access to pioneer spectrum for 5G.

B. Ensure a genuine RLAH experience for end-users

At retail level the overall objective is to give roaming customers a genuine RLAH experience and increase transparency. The Roaming Regulation establishes a common harmonised approach that ensures that roaming customers do not pay additional roaming charges for Union-wide roaming when periodically travelling within the Union. The enhanced RLAH experience aims to ensure that consumers can benefit from the same quality of service while roaming as at home, a high level of transparency to avoid bill-shocks, and access to emergency services for all in the same way as at home. The Regulation is built on the general objective of giving end-users the confidence to stay connected when they travel within the Union, and to become a driver of convergent pricing and other conditions in the Union.

This objective complements and is supported by the European Electronic Communication Code (EECC), measures that not only aims to enable high connectivity and 5G deployment for the benefit of all Europeans, but also to ensure effective protection of consumers in the context of e-communications, boosting their choice through an increased level of transparency of information and specific rules on maximum contract duration and number portability. These provisions play a fundamental role in facilitating consumers in making informed choices when choosing or changing operators, depending on the services and prices they offer. The rules further ensure the free of charge harmonised single European emergency number and caller location.

Furthermore roaming contributes to Shaping Europe's digital future. The digital transition should work for all, putting people first and opening new opportunities for business. The COVID pandemic has proven that technology that works for people is highly important. The cross-border connectivity further benefits the creation of a European social, educational, cultural and entrepreneurial area based on the mobility of individuals and digital data that facilitates communication between people. This will further strengthen the efforts towards the creation of a Digital Single Market where free movement of persons, services and capital is ensured, where the individuals and businesses can seamlessly access and engage in online activities under conditions of fair competition, and a high level of consumer and personal data protection.

C. Facilitate innovation, ensure access to all network technologies and generations , avoid misuse and reduce burden

The wholesale regulation should facilitate innovation and technological developments, and avoid misuse related to VAS. The review also aims to simplify and reduce the burden on operators and other stakeholders.

There is a need to ensure a future proof regulatory framework for consumers, businesses and operators to facilitate the access to next generation connectivity and modern technologies. Europe is investing in more strategic capacities, that allow us to develop and use digital solutions at scale and to strive for interoperability in key digital infrastructures, such as extensive 5G (and future 6G) networks. In the future QoS will be an increasingly important element of the mobile service offer and there is a need to ensure a future proof regulatory framework for consumers and operators. With 5G services, it will become increasingly important for consumers to know if they are able to use certain applications and services

[54] Initiative for the Review of the Broadband Cost Reduction Directive (Directive 2014/61/EU) in CWP 2020.

while roaming due to QoS limitations. For a genuine RLAH experience, operators should offer to end-users the same QoS as they offer at home.

Roaming is also relevant to facilitate innovation, benefiting users of connected objects. Indeed, the free movement of goods entails that objects connected by an operator in one Member State can be sold or used in another Member State. Users sometimes carry their connected objects with them when travelling. Therefore, machine-to-machine (M2M) connectivity is by nature a cross-border market. Since M2M is a critical enabler of 5G[55] and **Internet of Things**[56], facilitating M2M roaming is important to digitise EU industry and enable EU policies for sectors including health, the environment, transport and energy.

In the transport sector, roaming agreements might also favor the organization of business models conducive to innovation for Connected cars. The roaming initiative is therefore expected to contribute to the relevant EU Policy in the area, in particular for Cooperative Intelligent Transport Systems, which aim to increase road safety. It is also expected to help industrial organization to deliver cooperative, connected and automated driving.[57]

The Roaming Regulation further complements actions for the European Green Deal, enabling the use of "green" applications in the roaming situation, supporting energy efficiency and the use of smart mobility solutions, enabling environmentally friendly behavior by individuals.

In the health sector, roaming facilitates the efforts to fight against COVID-19 using tracing applications. Indeed, the relevant Commission Recommendation[58] recommends that Member States ensure interoperability of health applications in cross-border scenarios. More generally, this initiative is an enabler of the European Health Union[59] since it facilitates the availability of health services when travelling.

4.2 Specific objectives

The general objectives oriented towards consumers and operators and other businesses are further divided into specific objectives following the overall Intervention logic.

Figure 7. Intervention logic (drivers-problems-general and specific objectives)

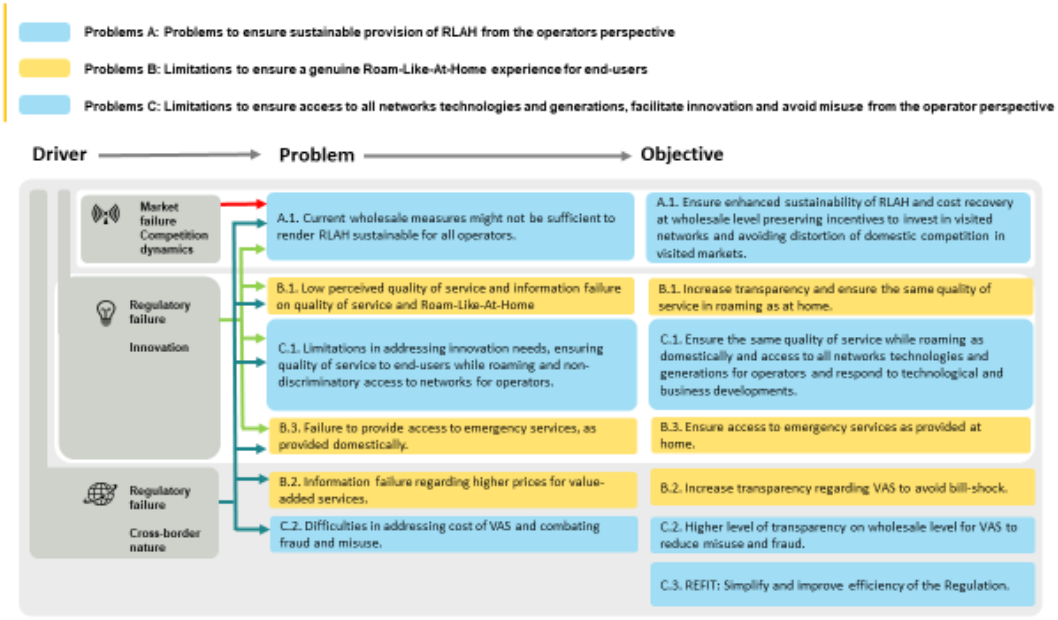
[55] 5G Action Plan for Europe - COM(2016)588.

[56] Staff Working Document: "Advancing the Internet of Things in Europe", accompanying the communication Digitising European Industry - Reaping the full benefits of a Digital Single Market COM(2016) 180.

[57] COM(2016) 766 of 30 Nov. 2016 on "A European strategy on Cooperative Intelligent Transport Systems, a milestone towards cooperative, connected and automated mobility".

[58] Commission Recommendation (EU)2020/518 of 8 April 2020 on a common Union toolbox for the use of technology and data to combat and exit from the COVID-19 crisis, in particular concerning mobile applications and the use of anonymised mobility data (in particular Art. 14 and recitals 14 and 19).

[59] Communication COM(2020) 724 of 11 November 2020 on Building a European Health Union: Reinforcing the EU's resilience for cross-border health threats.



4.2.1 A. Ensure sustainable provision of RLAH

Objective A1: Ensure enhanced sustainability of RLAH and cost recovery at wholesale level preserving incentives to invest in visited networks and avoiding distortion of domestic competition in visited markets. In order to ensure retail roaming services at domestic retail prices, wholesale roaming inputs must be available at a level that allows home operators to provide RLAH. This should enable a sustainable prohibition of retail roaming surcharges for operators in the EU, avoiding distortions on the home markets.

4.2.2 B. Ensure a genuine RLAH experience for end-users

Objective B1: Increase transparency and ensure the same quality of service in roaming as at home. Consumers and businesses should be well informed about QoS, so that they know what Quality of Service they can reasonably expect while roaming. While end-users in some cases experience lower quality of service than domestically, they may not always have sufficient understanding about the level of QoS they could reasonably expect, because of insufficient transparency concerning the provided QoS while roaming. Roaming customers should be able to use the mobile services that they pay for, and innovative services and applications that require 5G connectivity and higher QoS like at home, to the largest extent possible. This objective clarifies the obligations in terms of QoS and RLAH at retail level, addressing the end-users' perspective. This specific objective is complemented by specific objective C1 addressing the same problem from operators' perspective clarifying obligations at wholesale level.

Objective B2: Increase transparency regarding VAS to avoid bill-shock. Calls to certain numbers can generate additional costs when roaming in the EU/EEA compared to making the same calls at home. Mobile operators need to transparently inform end-users in the welcome message that roaming customers receive when connected to another EU/EEA operator, about the possibility to incur higher costs when calling certain numbers while roaming. Well informed end-users have less incentive to restrict their use of roaming services in fear of bill-shock.

Objective B3: Ensure access to emergency services as provided at home. End-users should be able to enjoy free of charge access to emergency services while roaming in the EU/EEA as this access is also ensured domestically, especially for end-users with disabilities. All end-users need to be adequately informed about the possibility to access to emergency services through emergency communications, including alternative means of access, while roaming in the EU/EEA.

4.2.3 C. Ensure the same QoS as at home and access to all network technologies and generations, facilitate innovation and avoid misuse/fraud from the operator perspective

Objective C1: Ensure the same quality of service while roaming as domestically and access to all network technologies and generations for operators and respond to technological and business developments. The home operators should not deliberately lower the QoS when roaming compared to the QoS offered in the home country. In addition, operators should facilitate access to all network technologies and generations on wholesale level, and ensure interoperability of roaming services on all available network generations, including 5G. To ensure that operators can offer, and end-users can efficiently enjoy, innovative services and applications that require 5G connectivity and higher QoS, wholesale network access to modern technologies needs to be facilitated to avoid limitations and delays. Adequate wholesale roaming price schemes are necessary to enable M2M roaming service, which require permanent roaming.

This objective clarifies the obligations in terms of QoS at wholesale level, addressing operators' perspective. Regulatory clarity on wholesale level is a precondition for resolving the problem at retail level, but also for meeting innovation needs and future proofing the Regulation. In the future QoS will be an increasingly important element of the mobile service offer and there is a need to ensure a future proof regulatory framework for consumers and operators. Clarifying the preconditions for the operator to effectively establish wholesale roaming agreements will facilitate both QoS like at home for roaming customers, and meet the specific objectives of innovation. This specific objective therefore complements specific objective B1, addressing the same QoS problem from end-users' perspective clarifying obligations at retail level.

Objective C2: Higher level of transparency on wholesale level for VAS to reduce misuse and fraud. A higher level of transparency on the value added services' numbers and charges applied to them needs to be ensured for mobile operators at wholesale level to hinder fraudulent use of roaming services.

Objective C3: REFIT: Simplify and improve efficiency of the Regulation. The repeal of inefficient obligations, rationalized monitoring obligations on operators and NRAs and lighter procedures for the revision of wholesale caps, should be considered to reduce the administrative burden.

5 WHAT ARE THE AVAILABLE POLICY OPTIONS?

5.1 What is the baseline from which options are assessed?

5.1.1 Choice of the Legislative Instrument

A regulation is the only suitable legislative instrument to effectively ensure that roaming customers continue benefitting from RLAH. The tangible benefits that citizens and enterprises currently enjoy as a result of RLAH should be ensured simultaneously in the entire EU, imposing equal obligations to all operators and fostering legal certainty.

The regulatory intervention in the form of a review of the existing regulation is therefore necessary to ensure the continuation and the functioning of a single telecom market across the Union. The Roaming Regulation has been substantially amended several times so that recasting is necessary in the interest of clarity.

5.1.2 Option 1 - Baseline: Prolong the Roaming Regulation without amendments

Under the baseline option, the Roaming Regulation would be prolonged, maintaining its current provisions both at retail and at wholesale level. Given that the 2019 Review report has confirmed the need of the current approach, deregulation of the market is discarded (see Section 5.3 on reasons for discarding options).

Annex 5 complements Section 5.1 and for each content area presents the measures already in place that would be prolonged. It also presents data assessing the initial situation, supporting evidence of existing problems, referring to the public consultation and survey feedback collected by the Commission.

Baseline A. Sustainable provision of RLAH

A1. Sustainability of RLAH and cost recovery at wholesale level preserving incentives to invest in visited networks and avoiding distortion of domestic competition in visited markets.

Under the baseline scenario, RLAH will continue unchanged from 30 June 2022 onwards. The caps applicable on 30/6/2022 will continue to apply (3.2 €cents/min, 1 €cent/SMS and 2.5 €/GB). The two safeguard mechanisms (fair use and sustainability)[60], provided in the Roaming Regulation remain in place.

Regarding the application of fair use policies, these have generally been stable and have not exceeded 4% of total roaming traffic for voice and 6% for data. Derogations are in general concentrated in only a few countries. The 2019 Review report, observes a continuous decrease in the number of derogations requested and granted, following the decline in wholesale caps. According to data collected by BEREC, sustainability derogations were granted to 8 MNOs and 16 MVNOs between 31 August 2018 and 31 August 2019[61].

How the situation would evolve under the baseline scenario

The rapid increase of roaming volumes (especially data) is expected to create sustainability challenges for several operators, especially outbounders and MVNOs. This is reflected in the results of the public consultation (see Annex 2), the BEREC opinion and the inputs collected from the market through the joint Commission-BEREC on-line survey.

Under the baseline scenario, the current measures at retail level (fair use policy and sustainability derogation) as well as on wholesale level (wholesale caps) would remain in place.

However, the current wholesale caps no longer appear to be fit for purpose, since maintaining the current caps would lead to non-negligible sustainability challenges. According to the

[60] Fair use policy is aimed to prevent abusive or anomalous use of roaming services at domestic prices (such as permanent roaming). Sustainability derogations refers to the exceptional and temporary derogations to forestall any risk of domestic price increases.

[61] See Annex 5 (Baseline) for a list of derogations granted per country. The number of derogations granted from 1 September 2019 is substantially reduced but this period is not considered representative, due to the overlap with the COVID pandemic.

sustainability analysis (see section 6.1 and Annex 4A), the provision of RLAH would be unsustainable for 27% of operators in 2023. This would likely imply that more operators (especially MVNOs) are likely to request and obtain sustainability derogations, to apply a surcharge to (parts of) roaming traffic.

The COVID pandemic and the baseline scenario

The COVID pandemic has a major impact on the tourism industry in 2020. Eurostat data on the nights spent at tourist accommodation establishments by foreign residents per member state show a sharp year-to-year reduction for the first period of the lock down (96.6% for April 2020 and 94.7% for May 2020) that slowly recovered with the partial lifting of measures (85.4% for June 2020 and 64.6% for July 2020). The overall year-to-year reduction for the first 7 months of 2020 is estimated to 56%.This massive collapse of tourism indicates a strong impact of the COVID pandemic to international roaming traffic.

While we do not have readily available data for Q2 2020 (the first peak of the pandemic) we can reasonably expect a significant reduction to roaming traffic, hence also to roaming revenues and costs. For inbounder operators[62] this means reduced roaming profits, following the drop in wholesale roaming revenues. On the other hand, for outbounder operators[63] and MVNOs it means reduced sustainability challenges, due to lower outbound roaming traffic (and the ensuing wholesale costs). This impact could well extend into 2021, depending on the roll-out of vaccination, the removal of travel restrictions and any new waves of the pandemic.

Given the review of the Roaming Regulation will enter into force in June 2022, the baseline should focus on values from 2022 onwards. The medium-long term effect of COVID is however unclear. The OECD "Tourism policy responses to the coronavirus" warns that travel restrictions and containment measures are likely to be in place for longer, and are expected to be lifted only gradually, with the possibility of reversal should new waves occur. Demand-side recovery will also take some time, given the interlinked consequences of the economic and health crises. This leads to growing expectations that recovery to pre-crisis levels may take two years or more. Yet, all the aforementioned views point towards an at least partial recovery, before the new Regulation enters into force in mid 2022.

At the same time, the pandemic has led to a substantial increase of digital services and an ensuing increase in connectivity demand[64]. The increased digital interaction is expected to affect the overall data usage and contribute to an accelerated increase in mobile roaming data consumption per travelling consumer with a potential long-term effect. This may at least partially compensate for any delay in the recovery of the tourism industry and any long-term reduction of business travelling, also linked to the increased use of digital channels.

On the other hand, we do not have any evidence or indication that telecom operators have changed their business practices (including on wholesale roaming tariffs), because of the COVID crisis. In view of the above, we do not expect a disruptive impact, which would affect

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[62] An inbounder operator has a customer base which consumes less mobile services abroad, than those consumed by the partner operators' customer base on its own network.

[63] An outbounder operator has a customer base which consumes more mobile services abroad (i.e. on the networks of partner operators in other EU/EEA countries), than those consumed by the partner operators' customer base on its own network (i.e. when acting as a visited network).

[64] The increasing use of teleworking, teleconferencing and in general digital services has led to substantially increased demand for connectivity and a up to 40% increase in mobile data traffic has been reported by telcos during the pandemic as indicated in ETNO policy note *The role of Digital Communications at the time of COVID-19: Building A Digitally-Enabled Recovery*, available here

the proposed policy options or the assumptions on the parameters used in the sustainability analysis.

As regards the impact from COVID on the roaming wholesale caps and the estimated costs of providing roaming wholesale services, it is recalled that mobile operators do not dimension their networks to solely serve roaming customers but rather dimension to domestic needs. If indeed operators in a Member State would need to take special account of roaming customers in the network dimensioning, this is termed a seasonal Member State, where peak consumption (and needed dimensioning of the network) is, to some degree, driven by roaming customers. If this is the case, the Member State is termed seasonal and this is taken into account in the modelling exercise performed by the consultants. For five Member States (Croatia, France, Greece, Malta and Spain), seasonality has been taken into account, meaning that these Member States have shown a need to further update their networks to facilitate increased consumption from roaming customers. Therefore, operators in these Member States appear to have some constraints coming from roaming customers, which in the case of COVID would imply that a lack of roaming customers could have some effect on network dimensioning. Looking at the estimates from the Axon cost model for these Member States reveals that current costs estimated is well below the maximum caps proposed in both 2022 and 2025, indicating that the caps proposed should also ensure cost recovery in these Member States despite uncertainties for roaming consumption.

For the 22 other Member States, it has not been shown that roaming customers exerts pressure on the capacity required in the network. Therefore, the networks constructed in the 22 Member States without seasonality are built to meet domestic demand, indicating that declining roaming customers as a result of COVID would equally not impact the estimated costs of providing roaming wholesale services.

The sensitivity analysis (Annex 4) developed some additional scenarios, which seek to examine how a prolonged impact of the COVID pandemic on international travelling could influence the ability of roaming providers to offer RLAH services in a sustainable manner. The analysis reflects that COVID ameliorates the sustainability challenges for outbounder operators and MVNOs in all four COVID-19 scenarios (COVID-19 High impact, COVID-19 Medium impact, COVID-19 Low impact and COVID-19 Minimum impact). In general the COVID-19 scenarios improvements does not surpass the results under the high sustainability scenario presented in Annex 4.

Baseline B. Ensure a genuine RLAH from an end-user perspective

B1. Perceived Quality of Service and transparency

The Roaming Regulation does not explicitly ensure that roaming end-users have access to retail roaming services of the same quality as at home (domestic QoS) even if the QoS is considered as an integral part of the price-regulated product. BEREC reports that 3 out of 30 NRAs have initiated procedures against operators not ensuring same QoS.

Article 6e (4) of the Roaming Regulation includes an obligation on the roaming provider to ensure that a contract which includes any type of regulated retail roaming service specifies the main characteristics of that service. This transparency obligation does not mention explicitly QoS.

At wholesale level, i.e. between operators, the regulation simply requires that an operator shall provide all necessary network elements along with roaming access, but does not require that the operator provides certain levels of QoS.

<u>How the situation would evolve under the baseline scenario:</u>

Customers would continue to be uninformed about the expected level of QoS for retail roaming services. Contracts are an important tool for end-users to ensure transparency of information and legal certainty. With the upcoming deployment of 5G retail services, and future technological developments, it is important for roaming customers to be well informed, since the lack of appropriate QoS might hinder the usage of certain applications while roaming (The business side of this issue is further explained in Section 2.1. problem C1).

The fragmented approach among NRAs on QoS monitoring as well as lack of transparency on QoS is expected to continue.

B2. Transparency on higher prices for value added services. At retail level, VAS can be subject to surcharges while roaming or can be blocked. According to the BEREC, operators indicate 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. This means for example that when calling a freephone number abroad consumers may incur surcharges. According to operators, VAS numbering ranges cannot be recognized in all countries in advance. This leads to unexpected termination costs and/or customer experience degradation. In addition, the fact that in the roaming situation is the visited operator that decides on the treatment of VAS prevents home operators from giving their customers transparent information on charges, as they do not know the associated wholesale costs.

Consumer 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.

How the situation would evolve under the baseline scenario

If no further action is taken, the difficulties as confirmed by the operators and consumer complaints are to remain or even increase following a general trend of growing use of roaming. The number of related complaints reported by NRAs remains limited but is increasing visibly and calls for measures[65]. (See Annex 5 for details) This can certainly have a negative impact on the end-users' confidence in the RLAH regime. The lack of transparency at wholesale level in particular cannot be adequately tackled at national level.

B3. Access to emergency services

Subject to Article 14 of the Roaming Regulation, end-users shall receive information on access to emergency services by dialing the European emergency number 112 free of charge. The Roaming Regulation does not include an obligation to inform end-users with disabilities about access to alternative emergency communications that are deployed at national level (these alternative means of access are not harmonised at EU level).

Provision of caller location is mandated through the Universal Service Directive and the Electronic Communications Code, but there is no obligation in the Roaming Regulation to ensure the exchange of the technical and regulatory information between the roaming partners, ensuring that caller location provision is free of charge for the end-user.

Caller location is the most important contextual information that allows emergency services to locate end-users and intervene efficiently. Roaming customers are at higher risk than domestic customers to not be able to determine their location when they request the assistance

[65] Joint Commission-BEREC online survey (2019) and BEREC questionnaire for the Transparency and Comparability Report (2020)

of emergency services. Therefore, the instant provision of accurate caller location information is all the more important in case of roaming end-users.

Alternative means of access are not harmonized[66], as a consequence, end-users with disabilities are not aware of access means and sometimes do not have access to emergency services while roaming. Disabled end-users are more at risk of not being informed about the means of access and, eventually, not having access to emergency services. The latest data provided by Member States (September 2020) indicate that the visited Member States do not have the jurisdiction or monitoring capability to ensure that the use of the means of access deployed in their jurisdiction is not charged by the home operator.

How the situation would evolve under the baseline scenario

The visited and the home operators do not systematically exchange relevant technical data to ensure proper, free of charge functioning of emergency communication and caller location (handset derived) for the end-user. As a consequence, home operators do not recognize emergency communications traffic and charge end-users.

In view of the fact that IP-based communication, using real-time text and multimedia is expected to be deployed in the medium term (as mandated by the European Accessibility Act), the lack of implementation of these solutions at roaming wholesale level could lead to a lack of access to emergency services (including when a prepaid customer exhausts their credit), lack of caller location and retail charges.

Baseline C. QoS, access to networks, innovation, and avoid misuse/fraud from the operator perspective

C1. QoS while roaming, innovation and access to networks

Article 3 of the Roaming Regulation obliges mobile network operators to meet all reasonable requests for wholesale roaming access, which shall cover access to all network elements and associated facilities, relevant services, software and information systems necessary for the provision of regulated roaming services to customers. The Roaming Regulation Article 16 (5) stipulates that end-to-end connectivity and interoperability of roaming services has to be ensured.

These provision aim to ensure that mobile operators can deliver retail roaming services to their customer when they travel. However, the current rules do not sufficiently ensure that operators should request and be granted access to the technologies that will enable them to provide the roaming services with the same QoS as domestically. There is still a small number of 3G-only wholesale agreements. According to the joint Commission-BEREC online survey 26% of MVNOs have 3G-only roaming available either in certain specified countries in the EU (4%) or in certain networks in certain countries in the EU (14%) or in general in the EU (8%).

In the Regulation, the wholesale roaming access obligations and wholesale data price cap apply in case such access is sought for the purposes of M2M communications as long as they are charged on a per unit, volume-based, basis like person-to-person communications.

[66]According to the information provided to the Commission by national authorities in the 2019 COCOM questionnaire , 14 Member States have deployed emergency applications, while 24 Members States have deployed SMS as alternative means of access for end-users with disabilities. Some Member States deploy both means of access. https://ec.europa.eu/digital-single-market/en/news/2019-report-implementation-european-emergency-number-112

Permanent roaming is not prohibited as such by the regulation and can be agreed by two roaming partners in the wholesale roaming contract.

How the situation would evolve under the baseline scenario

While the available data and consultation results indicate that operators in general do not deliberately lower the QoS for their roaming customers, there is evidence that some operators, in particular MVNOs have difficulties in gaining access to 4G networks. These observed difficulties in ensuring access to different network generations (in particular 4G), may continue. For the deployment of commercial 5G services, difficulties in ensuring access presents an even greater risk.

The baseline scenario might not sufficiently ensure that operators will have access to modern network technologies and be able to offer e.g. 5G services to their end-users when roaming. Stakeholders interpret the wholesale access obligations differently. Many stakeholders, in particular MNOs, consider that the current wholesale access rules are technology neutral. However, in the public consultation MNOs expressed that modern technologies, such as 5G and IoT narrowband do not fall under the scope of the rules because these technologies are not dedicated to assure retail roaming mobile services and are connected with huge investments costs. These doubts may limit the access of these technologies, posing a risk to innovation and competition. Unless access is ensured, operators and service providers will not be able to compete on the market.

Moreover, the 2019 Review report concludes that 5G technologies are likely to change the nature of roaming services in the long term. Among others, it could potentially affect the commercial model applied, e.g. basing pricing on bandwidth as opposed to usage. 5G could also provide options for MNOs and MVNOs to use access agreements as an alternative to traditional roaming, allowing them to enhance their flexibility on service differentiation (latency, security etc), which could prove to be very important for certain vertical use cases.

The new categories of use cases offered by the 5G technology concern, on the one hand, mission-critical cases such as remote healthcare or remote machine control and, on the other, massive object connectivity to get data from sensors in transport, energy, and environment. These new applications of communication networks are expected to be reflected in future roaming agreements.

Doubts on applicability of roaming rules to M2M might slow down the conclusion of wholesale agreements addressing the M2M emerging market needs.

C2. Transparency on VAS, misuse and fraud.

The general provisions in the Roaming Regulation enable the termination of wholesale roaming access agreements, in case of anomalous or abusive usage of roaming services on retail level.

VAS as such fall outside the scope of the Roaming Regulation, only the tariff component corresponding to the connection to such services is subject to the RLAH rule[67]. Operators indicate that VAS are generally excluded from wholesale contract negotiations and that VAS numbering ranges cannot be recognized in all countries in advance, which may lead to unexpected costs at the wholesale level. Some operators report having taken measures to tackle this situation, including negotiation of wholesale agreements, obtaining information

[67] BEREC input on EC's request for the preparation of the legislative proposal for the new roaming regulations, BoR(20)131, 30 June 2020, available here

about numbering ranges of other EEA countries, and blocking access to VAS to their customers while roaming.

Where operators are victims of misuse/fraud linked to VAS, an NRA would still be mandated by the Roaming rules to require immediate cessation of a breach of the obligations set out in this regulation, and to the right of the visited network operator to apply adequate measures in order to combat fraud.

According to the 2020 joint Commission-BEREC online survey, more than 30% of MNOs have incurred extra costs resulting from unexpected wholesale charges for communications related to VAS by their customers while roaming in the EEA. Almost half of the MNOs reported being aware of abusive use of SIM cards in voice and/or SMS roaming communications. More than 40% of these operators report about considerable losses linked to fraud and misuses related to value added services with a median of € 70,000.

How the situation would evolve under the baseline scenario:

Operators will continue to be uninformed about VAS number ranges subject to higher termination rates. In the absence of measures promoting transparency, operators will continue to face substantial losses. Therefore, they will continue to take unilateral measures, mostly through fragmented efforts to obtain information about VAS number ranges in other EEA countries but also by blocking calls to VAS, which also leads to consumer complaints.

5.2 Description of the policy options

The analysis of alterative measures to the baseline was firstly developed per thematic area, covering sustainability (A), Quality of Service and innovation (B1 and C1), value added services (B2 and C2) and emergency communications (B3), comparing all possible alternative measures to address problems for each thematic area (including measures that were later discarded) and assessing their possible impacts and benefits, considering synergies between measures. Based on this preliminary analysis the aggregated options presented below were identified. The discarded alternative measures per each objective area are presented in Annex 9.

5.2.1 Option 2: Continuity, clarifications, increased transparency and competition

Option 2A. Sustainable provision of RLAH

A1 – Enhance operators' capacity to sustain RLAH while respecting cost recovery for network operators offering wholesale roaming access. The level of wholesale caps would remain at the level valid until 30 June 2022 for calls made, SMS messages and data at the respective values of 0.032 € per minute, 0.01 € per SMS, and 2.5 € per GB.

In addition, it is proposed to complement the price caps by encouraging emerging possibilities for the operators to trade wholesale roaming traffic in a non-discriminatory way. This could prove to improve competition in the roaming wholesale market and is as such welcomed by the Commission, that will keep monitoring these developments and assess the situation in the context of the report by the end of 2025.

Option 2B. Ensure a genuine RLAH

B1 – Increase transparency regarding QoS: Operators should increase transparency regarding QoS, by providing clear information to the end-user, e.g. in the contract about the QoS that the end-user can reasonably expect, while roaming in the EU.

In the public consultation 63% of the respondents, across the stakeholder groups, replied that it would be very relevant to include a transparency obligation on QoS. It is supported in particular by citizens and consumer organisations, while M(V)NOs are less positive to such an obligation (15 out of 34 do not think it is relevant and 6 are positive). BEREC supports additional transparency measures regarding QoS in roaming.[68]

B2. - Increase transparency regarding VAS: Operators should increase transparency regarding the risk for bill-shocks from calls to VAS number, e.g. by providing a clear warning in all contracts that include roaming services and explanations about the types of services that may be subject to increased costs.

B3 - Increase transparency regarding access to emergency services: Operators should increase end-user awareness about available means of access to emergency services, by including relevant information in the automated "Welcome SMS". This transparency measure would require that Member States make relevant information on alternative means of access to emergency services readily available.

Option 2C. QoS, access to networks, facilitate innovation and avoid misuse/fraud

C1 – Clarify technology neutral access obligations for wholesale roaming services. The basic principle of neutrality implies that operators should remain neutral towards technology when granting access to their networks. This clarification would imply that the visited operator has to grant access to any requested network generation as long as the request is reasonable and hereby facilitate access to all network generations, including modern technologies. The visited MNO should not refuse an access request or impede the access process to a certain network technology e.g. 4G and instead offer only access to 3G, or 4G instead of 5G.

It would further enable home operators to access the same networks generations that they offer domestically and hereby tackle the issue of some M(V)NOs only granted access to 3G services. This measure is supported by BEREC.[69]

C2 - Increase transparency on wholesale level for VAS. Option 2 proposes an obligation for each Member State to publish national VAS number ranges.

C3 – Introduce a minimum level of simplification by removing obligations and repealing acts that have become redundant with RLAH[70]. In addition, the burden on operators outside the Eurozone would decrease by aligning the revision mechanisms for maximum charges linked to the use of currencies other than the Euro that are used for roaming charges and intra-EU communications charges [71]. Measure requested and supported by some authorities outside the Eurozone.

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[68] BEREC Opinion on the functioning of the roaming market, BoR(19)101, 19 June 2019.

[69] Indicated in BEREC input BoR (20)131 p. 22.

[70] Repeal of the Implementing Regulation on weighted average of maximum mobile termination rates (instead the Eurorate will apply), and removal of the obligation for the separate sale of data roaming services (local data break-out) which has become redundant with RLAH. This measure is supported by BEREC, see BEREC input on EC's request for the preparation of the legislative proposal for the new roaming regulations, BEREC BoR (20) 131, 30 June 2020.

[71] The Roaming Regulation sets out rules that oblige service providers in Member States outside the Eurozone to annually revise the maximum surcharges for regulated roaming services and intra-EU communications. Currently different dates are used to determine the reference rate for roaming charges and intra-EU charges.

5.2.2 Option 3: Sustainable and genuine RLAH

This option would consist of proposing a review and prolongation of the Roaming Regulation (in the form of a recast). It would contain the similar provisions at retail and wholesale level as the Roaming Regulation in force, but with essential provisions to improve sustainability of operators to provide RLAH through reduced caps at wholesale level (A1 below).

Some additional important enhancements could be considered to allow a genuine RLAH experience for end-users and to respond to technological and business developments (B and C below)

Option 3A. Sustainable provision of RLAH

A1. Ensure enhanced sustainability of RLAH and cost recovery at wholesale level - Reduction of caps and measures to promote competition

EU-wide wholesale roaming caps would be set at lower levels than the caps valid until 30 June 2022 for calls made, SMS messages and data. In line with the policy choice made already in the Roaming Regulation in force, the new levels of the caps would allow recovery of costs of providing wholesale roaming services in all Member States, including a relevant share of joint and common costs. Reducing the caps would also affect elements that are determined based on the level of wholesale caps, as the maximum level of surcharges imposed under the fair use policy mechanism and the sustainability derogations as well as the data allowance of the fair use policy (FUP) on open data bundles and pre-paid limits[72].

The caps have been defined considering the estimates of the costs for a hypothetical efficient operator in the highest cost Member States, using a variety of evidence sources such as the cost model developed for the Commission by Axon Partners, assumptions underlying regulated termination rates for voice evidence from domestic and roaming wholesale markets and from domestic retail prices.

This initiative aims to strike a balance between ensuring cost recovery and minimizing sustainability challenges. To reconcile the two objectives this option consists of a two-step reduction of caps, as indicated in Table 1, the proposed caps are derived from the estimated costs from the cost model (see Annex 4C for a description of the model and an outline of the results). Overall, the cost model indicates room for proposing a decrease of the three applicable caps. Across wholesale voice, data and SMS, the current caps are well-above the estimated costs in all Member States and the cost model estimates decreasing costs in 2022-2025 for the provision of wholesale voice and data services.

For data roaming services, from 1 January 2022 until 1 July 2022, the applicable wholesale cap stands at 2.5 EUR/GB. The highest estimated cost from the cost model including transit in 2022 is 1.74 EUR/GB. In Q1 2020, the average wholesale price charged has been 1.53 EUR/GB but ranges in the member states from 1 EUR/GB to more than 2.5 EUR/GB.

Regarding voice roaming services the wholesale cap has been 0.032 EUR/min since 15 June 2017 (and will remain applicable until 30 June 2022). The cost model estimates a decreasing cost from 2022-2025. Taking also into account the forthcoming Eurorate for mobile

[72] See Implementing Regulation (EU) 2016/2286 and Annex 7.

termination[73], the highest estimated cost decreases from 0.022 EUR/min in 2022 to 0.0184 EUR/min in 2025.

The wholesale cap setting the maximum charge for one SMS while roaming has been constant since the introduction of Roam-Like-at-Home (15 July 2017), at 0.01 EUR/SMS. The cost model estimates a fairly constant cost for delivering this service in the modelled period of just under 0.003 EUR/SMS for the period 2022-2025.Considering the above observations, this option proposes a continuation of the decreasing cap observed since 2017. Specifically, the option proposes to set a two-step glide path for the caps for data, voice and SMS. The intention is to accommodate the decreasing costs observed in the cost model whilst gradually reducing the caps to minimize disruptions for the operators.

A two-step glide path therefore balances the two objectives of ensuring sustainability and allowing recovery of costs for all operators. It also allows for a gradual reduction to the estimated efficient costs of providing the relevant service. Further, for voice roaming service, the two-step glide path takes into account the decreasing costs for termination as set by the delegated act on maximum Union-wide termination rate.

Specifically for data, the cap of 2 EUR/GB proposed in 2022 is slightly above the maximum efficient cost of 1.74 EUR/GB estimated for the same year. This cap is proposed to balance the transition to the cost proposed in 2025 of 1.5 EUR/GB and ensure that the operators have sufficient time to negotiate wholesale agreements reflecting the decreasing caps. This cap proposed will ensure a gradual reduction to the cap proposed in 2025 in line with the reductions of data caps seen in the previous years.

Summarising the elements outlined above, Table 1 presents the two-step glide path for wholesale roaming data, voice and SMS.

Table 1: Wholesale caps glide path from 2022 onwards

	From 1/7/2022 to 31/12/2024	**From 1/1/2025**
Voice	0.022 €/min	0.019 €/min
SMS	0.004 €/SMS	0.003 €/SMS
Data	2 €/GB	1.5 €/GB

The preparatory work for this initiative has assessed the possibility to present alternative options for the new wholesale caps, however given the analysis presented above and in particular the need to ensure cost recovery leaving also some room for negotiation, those alternatives were not considered relevant for the impact assessment.

For further updates of wholesale caps beyond 2026 based on an updated cost model see proposed possibility to amend the caps through a delegated act under the simplification/REFIT measure C3 presented below.

The Commission will monitor pro- competitive developments linked to non-discriminatory trading (as discussed in option 2, see also Section 9) and assess the situation in the context of the report by the end of 2025 and consider additional measures, if deemed necessary.

[73] Here, maximum Union-wide mobile termination rates are set to follow a glide path starting in 2021 at 0.7 EURcents/min, decreasing to 0.55 (2022), 0.4 (2023) and 0.2 (2024). (link to final delegated act to be added)

The majority of respondents in the public consultation agree or strongly agree that the EU intervention had a positive effect in ensuring the sustainability of the wholesale roaming markets for voice, data and SMS, compared to what Member States could achieve acting alone. The majority of M(V)NOs agree (28 out of 52 respondents), as well as the consumer organisations (5 our of 5) and public authorities (5 out of 5). Opposing views do not exceed 15% of respondents. In parallel, almost half of the respondents express the view that retail roaming services are not sustainable with the current wholesale roaming caps, effectively supporting a reduction to wholesale caps. By contrast, only 1 out of 5 respondents support the opposite view. All responding MVNOs (9 out of 9) express that retail roaming services are not sustainable. MNOs are more divided and 11 out of 25 think that retail roaming services are not sustainable with the current wholesale roaming caps, 9 think that they are and 5 remain neutral.

Stakeholders seem to have divided views on the level of price caps. Large inbounder network operators (and especially multinational groups) tend to favour maintaining the wholesale caps at the current level. On the other hand, small outbounder network operators and virtual operators seem to support significant lowering of caps. We expect a similar trend to apply also to the views of Member States and public authorities. However, the public consultation did not render a sufficient number of data to present the views. BEREC in its opinion supported a reduction of price caps, as long as it ensures efficient cost recovery by the MNOs[74].

Option 3B. Ensure a genuine RLAH

In addition to the transparency obligation in Option 2, Option 3 includes:

B1 – Prohibiting home operators from deliberately offering lower QoS, (e.g. limiting access to 3G instead of 4G in wholesale agreements), compared to the QoS offered in the home country. It foresees an obligation on retail and wholesale level. The QoS that a home operator needs to provide to its end customer while roaming depends on the technically available QoS level that is possible in the visited network, i.e. some networks may not be able to support the same QoS level as the home operator's network.

Such an obligation would allow the NRAs of the home operator to monitor the compliance with the rules. It would also ensure that end-users are able to use innovative services over modern technologies such connected devices and 5G services.

73% of all respondents to the public consultation support a measure prohibiting the home operator to deliberately lower the QoS while roaming, compared to the QoS offered in the home country. 60% (86 out of 95) of the citizens and consumer organisations think that such an obligation is relevant. 6 out of 25 MNOs have expressed that such an obligation would be relevant, while 10 do not think it is relevant and 6 are neutral. Among the MVNO/Es 4 do think it is relevant while 3 do not and 1 is neutral. Among the other business stakeholders, including SMEs/entrepreneurs/vertical industries/IoT & M2M and industry associations 4 out of 5 think such a measure would be relevant.

[74] BEREC Opinion on the functioning of the roaming market, BoR(19)101, 19 June 2019.

BEREC in its opinion supported such a measure, suggesting that the Roaming Regulation must make clear that conditions of the domestic offer must not be altered by the home operator during roaming.[75].

B2. Increase transparency regarding VAS. Two obligations will be included for all operators, in addition to the one in Option 2:

(a) Include in the "welcome SMS" a warning about calls to VAS numbers and the risk for bill-shocks, including a link to the web page of point (b).BEREC supports this, as a more targeted solution. In the public consultation, the majority of respondents (62%) supported the proposal to include information on VAS in the "Welcome SMS".

(b) Provide a dedicated web page warning about the risk of bill shock when using VAS while roaming and detailed information about the types of services (calls and SMS) and the number ranges that may be subject to increased costs or blocking. This is intended to serve as a reference, for any end user who sees the warning in the "Welcome SMS" and wants more information.

The proposal to introduce an obligation on mobile operators to include in the "Welcome SMS" an alert informing that these types of communications may not be under the RLAH principle was supported by a majority of respondents (85, i.e. 62%) in the public consultation. BEREC in its opinion supported these additional transparency measures regarding VAS.[76]

As regards access to emergency services, in addition to the transparency measure in Option 2, option 3 includes measures to:

B3: Ensure access to emergency services in the visited country. It would clarify that, in order to enable the home operator provide free access to emergency services and free of charge provision of caller location information for all roaming end-users, as stipulated in Article 109 of the Electronic Communications Code, the visited operator should provide necessary technical and regulatory information to this effect. A way forward could be adding the necessary provision in the wholesale agreements.

In addition, home operators will have an obligation to inform customers at retail level on the possibility to access emergency services through alternative means.

B3: Ensure access to emergency services free of charge as at home. Not charging the emergency communications at wholesale level by the visited operator, would enable home operators to replicate the free of charge provision of emergency communication at retail level. As indicated in its additional input to the Commission, BEREC supports a clarification about the provider responsibility for bearing costs at the wholesale level would give more regulatory certainty especially for NRAs.[77] In the public consultation, 26% of the respondents expressed that this measure would be relevant, while it was considered not relevant by 28% of the respondents.

Option 3C. QoS, access to networks, facilitate innovation, and avoid misuse/fraud

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[75] BEREC Opinion on the functioning of the roaming market, BoR(19)101, 19 June 2019. See also BEREC additional input to the Commission BoR (20) 131, 30 June 2020.

[76] BEREC Opinion on the functioning of the roaming market, BoR(19)101, 19 June 2019. See also BEREC input on EC's request for the preparation of the legislative proposal for the new roaming regulations, BEREC BoR (20) 131, 30 June 2020.

[77] BEREC input on EC's request for the preparation of the legislative proposal for the new roaming regulations, BEREC BoR (20) 131, 30 June 2020.

On QoS and innovation, in addition to the measure proposed in Option 2, Option 3 includes the following measures:

C1: Ensure the same QoS while roaming as at home and respond to technological and business developments by clarifying the obligation on visited MNOs to give access to all network technologies and generations (2G, 3G, 4G, 5G etc.), **upon a reasonable wholesale roaming access request**. Clarifying the principle of access to all network technologies and generations on will allow all operators (MNOs and MVNOs alike) an equal and fair prospect to access the networks available to offer retail roaming services like at home. It would contribute to more equal terms for competition in the retail market, in particular for MVNOs. Whether or not an operator seeking access can offer reciprocal access in his network should not be a limitation. Furthermore, a reference offer should not be made in such a way that access to a certain technology is made more/less favorable.

The QoS for roaming services shall not be limited or hampered by access restrictions. The principle of access to all network technologies and generations ensures that MNOs do not limit wholesale roaming access seekers from offering retail roaming services to their end-users on any given network. This would allow wholesale roaming operators seeking access to effectively replicate the domestic retail offers, when technically feasible, in a roaming context. It aims to address also innovation and business developments, ensuring the widest use of 5G and modern connected services and to minimize the risk that end-users would not be able to use certain applications requiring 5G technology while crossing borders.

This option is supported by BEREC[78] and other stakeholders. 75% of all respondents are positive to an obligation MNOs to give access to all network technologies and generations (2G, 3G, 4G, 5G etc.) non-discriminatory access, upon a reasonable wholesale roaming access request. 89% (85 out of 95) of the citizens and consumer organisations think that such an obligation is relevant. 7 out of 25 MNOs have expressed that such an obligation would be relevant, while 8 do not think it is relevant and 6 are neutral. Among the MVNO/Es 7 do think it is relevant while 2 are neutral. Among the other business stakeholders, including SMEs/entrepreneurs/vertical industries/IoT & M2M and industry associations 4 out of 5 think such a measure would be relevant.

To address emerging needs of the evolving M2M market, the option will clarify that operators could employ charging schemes other than the volume based tariffs that are typically used (e.g. per SIM card and month) through alternative wholesale tariffs to be applied on voluntary basis. Given the expected market developments, operators are encouraged to accept all reasonable requests for establishing (or amending) roaming agreements for M2M communications services. Commercial agreements where operators explicitly allow permanent roaming for M2M are an expected trend for roaming wholesale agreements. Operators might increasingly agree not to consider caps to such charging schemes nor to any tariffs that apply in cases of permanent roaming and foresee offers that are better adapted to requirements of this market, that is still in its early stage of development.

The Commission will monitor the developments of roaming wholesale services for the M2M market and related commercial agreements (See also Section 9) and assess the situation in the context of the report by the end of 2025.

C2: European database on VAS number ranges to ensure higher level of transparency on wholesale level.

[78] BoR (20) 131, p. 37.

This measure envisages establishing a centralized European database for VAS numbering ranges but without information on wholesale tariffs (as this would significantly complicate the maintenance process). It is intended as a transparency tool that would enable NRAs and operators to have direct access to information about which numbering ranges can generate higher costs (termination rates) in all Member States. Accessibility will be limited, only to roaming providers and NRAs. The Regulation will not stipulate its usage but rather leave it to the discretion of NRAs and operators. NRAs could use it to confirm if high wholesale rates requested for a call to a specific number is indeed justified. Operators could use it to control calls to VAS, to warn consumers that the call might have increased cost. They could even block calls to certain number ranges, in case of suspicious fraudulent activity.

The task of establishing and maintaining the database can be assigned to BEREC. It is estimated that a maximum of 3 years from the adoption of the Regulation should be sufficient for developing such a database. BEREC has already initiated a similar (though much simpler) project for building a list (xls file) with all number ranges for voice-based Premium Rate Services and directory enquiry services in the EEA[79].

In its opinion BoR(20) 131, BEREC supports this approach. Several operators have also suggested establishing such a database, in their responses to the joint Commission-BEREC online survey of 2020. More than 70% of respondents to the public consultation confirmed the need for introducing measures in the Roaming Regulation against bill-shocks from calls to VAS. The idea of setting up a European database for VAS was generally welcomed by stakeholders (more than 70% from all respondents groups), and in particular by operators and their associations, while 9% of respondents (a few companies and citizens) considered this solution not relevant. All consumer organizations (5) remained neutral.

C3. REFIT Horizontal simplification and improvement measures.

In addition to measures proposed in Option 2, under Option 3 the following would be included to further simplify the Regulation and reduce administrative burden.

It should introduce a possibility to use a lighter system for any future revision of wholesale caps. A full legislative process to revise the wholesale caps could be considered non-efficient. Regulatory efficiency could be achieved through an empowerment included in the new Regulation, setting the details of the methodology to be applied by the Commission for the revision of caps. Based on an updated cost model from 2026 onwards it would become possible to amend the caps through a delegated act. BEREC should have a role in this process, similarly to the delegated act setting the Union-wide voice termination rates under Art 75 of the EECC.

Such a light procedure would only be used, if the report on the functioning of the roaming market (foreseen for 2025) shows a need for regulatory intervention. Alternatively, the caps could remain unchanged after 2025, if competitive conditions show a well-functioning market. Only if there is a need for more structural changes to the Regulation itself, the Roaming Regulation would be reviewed.

Further simplification might be introduced in the monitoring process, possibly reducing the burden on operators and NRAs. In the framework of the coordination with BEREC, the Commission services will examine the possibility of merging and streamlining monitoring processes, including the obligation to publish the yearly report on transparency and comparability of roaming tariffs with the international roaming benchmark report and

[79] BoR(20) 131, p. 29.

respective questionnaire. However, it is not planned to reduce considerably the data collected, since this would have a negative effect on the Commission's ability to provide an adequate level of monitoring of the roaming market and analysis in future reviews and impact assessments, especially as regards regulation of wholesale pricing and roaming market dynamics. In its additional input to the Commission BEREC suggests simplifying the monitoring obligations by covering the data collection of the transparency and comparability report within the scope of the international benchmark report.[80]

5.2.3 Option 4: Expanded wholesale obligations for an enhanced RLAH experience

Option 4A. Sustainable provision of RLAH

A1. Ensure enhanced sustainability of RLAH and cost recovery at wholesale level. This option is identical to option 3 but with the addition of measures aiming at alleviating the burden on MVNOs. Specifically, it mandates MNOs to pass the discounts they get on the rates for regulated wholesale roaming services to the MVNOs they host. This measure is relevant for those MVNOs that obtain wholesale roaming services through some sort of a resale agreement and not through bilateral negotiations (92% of full MVNOs and all light MVNOs, according to the June 2019 BEREC Opinion).

Around 30% of the respondents expressed a positive view on this proposal, another 30% indicated a negative view and around 40% did not reply or had a neutral view. Out of the respondents who expressed a view 16 out of 17 MNOs do not think such an obligation would be relevant, while 7 out 9 MVNO/Es think it is relevant. A limited number of other respondent group replied to this question, however the small number of responding consumer organisations and public authorities in general support this option.

Option 4B. Ensure a genuine RLAH

As regards QoS and innovation, in addition to the transparency obligation and obligation on prohibiting the home operator from deliberately offering lower QoS while roaming in Option 3, this option foresees also an obligation on the visited operator.

B1: Visited operators would be prohibited from deliberately offering lower quality of service for roaming customers in the visited network (e.g. limiting access to 3G instead of 4G), than what can technically be offered in the visited network.

This measure envisages introducing an explicit obligation on the visited mobile operator. The visited operator shall not deliberately limit access to its network for roaming customers and should not discriminate between their own customers and roaming customers by e.g. throttling the speed for roaming customers.

It is up to the home operator to ensure that access is requested for at least the same level of quality, if technically possible, in the visited network. The visited operator will be prohibited from deliberately lowering the QoS while roaming (e.g. limiting access to 3G instead of 4G or limiting the bandwidth) compared to what can technically be offered in the visited network and what has been agreed between the operators. This obligation would entail additional responsibility on the visited MNO to ensure that roaming customers in the visited network can

[80] BEREC input on EC's request for the preparation of the legislative proposal for the new roaming regulations, BEREC BoR (20) 131, 30 June 2020.

enjoy the same QoS as at home (depending on what has been agreed in the wholesale agreement), without discrimination.

78% of all respondents are positive to an obligation on the visited mobile operator at retail and wholesale level, prohibiting deliberately lowering the quality of service while roaming (e.g. limiting access to 3G instead of 4G), compared to the quality of service offered in the home country. The majority of these respondents are citizens and consumer organisations (63%). 96% (91 out of 95) of the citizens and consumer organisations think that such an obligation is relevant.

B2. Increased control regarding VAS via dedicated (opt-in) mechanism. The opt-in mechanism means that customers who want to use VAS also while roaming would need to inform their roaming provider.

BEREC has considered this option as a possible solution, indicating however that its technical feasibility and its implementation costs for the roaming providers would have to be further assessed. In the public consultation, more than half of the respondents (57%) supported this proposal. However, operators were less positive, which reflects its technical complexity.

As regards access to Emergency services, and in addition to the measures proposed in Option 3 and in alternative to the transparency measure in Option 2, this option includes:

B3: Opt-in functionality for additional information on available alternative means of access to emergency services. It would enable end-users with disabilities to opt-in to receiving additional information about alternative means of access to emergency services. Information could for example be received through an additional SMS with information specifically about the available means of access to emergency services in the visited Member State.

This measure had some support by stakeholders participating in the public consultation. Amongst those respondents that expressed their opinion on the relevance of the proposal (52%), 16 found it relevant and 18 did not find it relevant. However, among those who considered the proposal relevant (relevant (11) or very relevant (5)) the European Disability Forum, European Union for Deaf and European Emergency Number Association consider it very relevant.

Option 4C. QoS, access to networks, facilitate innovation, and avoid misuse/fraud

C1: Obligation on the home operator at wholesale level to request the same QoS as offered at home, for all wholesale agreements, i.e. no preferred network. It would ensure that the roaming customers receive equivalent roaming services to the mobile services enjoyed at home, irrespective of the visited network(s) in the same visited country.

C2. Higher level of transparency on wholesale level for VAS. This an expanded version of option 3. It envisages establishing a centralised European database for VAS numbering ranges, including tariff information, allowing end-users to access information about VAS numbering ranges and charges. The task of establishing and maintaining the database will be assigned to BEREC.

As underlined in section 5.2.2, more than 70% of respondents expressed their agreement to the development of a database with VAS number ranges and relevant termination rates that is open to the public.

C3. REFIT Horizontal simplification and improvement measures, are the same as under Option 3.

5.3 Options discarded at an early stage

The non-prolongation option has been discarded upfront based on the following reasons:

i. Findings of the 2019 Review report and BEREC opinions

The Review report has gathered a broad range of data and presents evidence to evaluate how the Roaming Regulation has performed and how the roaming markets are functioning and has confirmed the validity of the current approach. Deregulation is therefore not considered, since it would seriously risk the successful achievements the roaming intervention has brought to consumers and businesses. For additional details on the Review report and evaluation elements see Annex 6.

ii. Unsustainability of RLAH without regulation

The Review report and section 2.2 of this IA both explain why RLAH cannot be sustained absent regulation given the observed market and regulatory failures. RLAH and its sustainable provision by operators have been ensured through the regulation of EU wide wholesale caps. If the Regulation is left to expire and the wholesale market would be left unregulated, there would be a market failure. Prices of "rest of the world roaming" (RoW roaming) demonstrate that without regulation prices would be considerably different.

iii. Cost of non-Europe in this area:

There are 170 million European roaming customers currently enjoying RLAH that would risk to lose consumers benefits as presented in Section 3.2 that includes an estimate of the Consumer surplus as quantified by JRC (see also Annex 4).

iv. Stakeholders feedback and Eurobarometer confirming benefits

The public consultation on the review of the Roaming Regulation confirms that the Roaming Regulation for EU citizens and businesses is still needed, and none of the respondents explicitly proposed to lift the regulation. 96% of the citizens strongly agree (87%) or agree (9%) that they can enjoy the benefits that the Roaming Regulation aims to bring. The benefits include staying connected without having to restrict their usage of roaming, not worrying about having to pay excessive costs for the use of mobile services and continuing to use mobile services like at home . 74% of all respondents consider the regulation significantly relevant, while 10% are neutral and 8% expressed that the relevance is moderate. The 2018 Eurobarometer survey showed that 81% of travelers were aware that roaming charges had ended in the EU/EEA and 69% of all Europeans responded that they, or someone they know, benefit or will benefit. The feedback received by the Commission from consumer associations since June 2017 is overall very positive.

v. Political feasibility and misleading consumers

There seems to be a high level of political consensus to the continuation of the current policy. It would be therefore unrealistic to consider that the policy would come to an end. Consumers have also adapted consumption patterns to RLAH and would risk to incur bill shocks.

A complete list of options which have been discarded based on the exclusion criteria is included in Annex 9.

6 WHAT ARE THE IMPACTS OF THE POLICY OPTIONS?

This section will assess the social, economic and environmental impacts of the options based on the assessment criteria indicated in Table 2 below.

Table 2: Criteria to assess the impacts of each option compared to the baseline

	Key criteria	Key issues
ECONOMIC IMPACT, SMEs, INNOVATION, DIGITAL SINGLE MARKET		
I	**Sustainable provision of RLAH, cost recovery and other economic impacts on operators**	What is the economic impact on operators' retail roaming margin? To what extent do measures ensure sustainability of RLAH and cost recovery at wholesale level, preserving incentives to invest in visited networks and avoiding distortion of domestic competition in visited markets? To what extent would operators be able to limit negative economic impacts from fraud and misuse problems linked to VAS?
II	**Impact on SME, on Digital single market and digital economy and facilitated innovation**	What is the Impact on SMEs, to what extent does this option foster the completion of the digital single market, enables benefits for the digital economy? To what extent would measures respond to technological and business developments facilitate innovation, 5G and M2M services development in the Single Market?
III	**Administrative burden and compliance cost**	What are the compliance costs and the administrative burden on operators, public authorities?
CONSUMERS BENEFITS/SOCIAL IMPACTS		
IV	**Genuine RLAH experience and social impact (112 and disabled end-users**	What is the impact on consumers? Would the option enable consumers to enjoy a genuine RLAH experience? Would it help to prevent bill shocks? Would access to emergency services be ensured like at home for all end-users? To what extent it meets specific needs of disabled end-users?
ENVIRONMENTAL IMPACT		
V	**Environmental implications**	Does the option have any impact on the environment (compared to the baseline option)?

6.1 Model for the assessment of economic impacts (sustainability analysis)

To assess the impact of the various policy options on the sustainable provision of RLAH (sustainability analysis), the Commission services have designed a model that evaluates the economic impact of RLAH on operators, taking into account the different policy options and the (forecasted) functioning of the roaming market. The analysis seeks to estimate the number of operators for which the provision of RLAH would be unsustainable[81].

The model utilises data collected by BEREC in the framework of the International Roaming Benchmarking Reports, covering the period Q4 2016 to Q1 2020. The analysis covers a set of 96 operators, 72 MNOs and 24 MVNOs. It produces consumption forecasts for the period 2020-2025, based on the information on outbound and inbound volumes from 2017 Q2 up to 2019 Q4, as well on the EUROSTAT monthly data on "*Nights spent at tourist accommodation establishments"*. It then utilizes the above forecasts to assess sustainability at operator level over a 6-year horizon.

Sustainability, as defined in the Commission Implementing Regulation, is the ratio (in percentage) that compares the "Roaming Margin" (the difference between roaming revenues and roaming costs) with the "Domestic Margin" (operator profits from domestic services).

The analysis also examines the robustness of the forecasts by performing a sensitivity analysis. It specifically examines how sustainability develops under different scenarios

[81] The Commission Implementing Regulation 2016/2286 (Article 10, par. 1), stipulates that the ability of a roaming provider to recover its costs of providing regulated retail roaming services, would be undermined, only where the negative roaming retail net margin is equivalent to 3% or more of its mobile services margin.

leading to improved or deteriorated sustainability results as well as by taking into account the impact of the COVID pandemic (See Annex 4A for details).

6.2 Impact of Option 2

6.2.1 Sustainable provision of RLAH and other economic impacts on operators

Option 2 fails to make a difference compared to the baseline, alleviating sustainability challenges for operators, but ensures cost recovery for the provision of wholesale roaming.

According to the sustainability analysis (see section 6.1), in 2023 the provision of RLAH would be unsustainable for 26% of operators (compared to 27% in the baseline). Sustainability improvements could lead to a reduction of the total negative roaming margin[82], compared to the baseline option by 23% in 2023 and 22% in 2025.

Concerning the risk of fraudulent generation of traffic towards international numbers (see section 2.1.4, problem C2, 'misuse'), option 2 proposes a simple solution to increase transparency of VAS number ranges. This is intended as a tool that operators could use in a way that can reduce the risk for (wholesale) bill shocks from calls to VAS numbers and mitigate the risks linked to the artificial generation of traffic towards international destinations. However, it will be complex and potentially costly to use, because information on VAS will be dispersed in various sites. As a result, we expect that several operators (especially smaller ones) will be unwilling to use it.

6.2.2 Genuine RLAH experience and social impact

The expected positive impact on end-users capacity to benefit from RLAH is limited since sustainability measures are not expected to have a major impact (as analysed in section 6.1.2). The analysis done by the Commission services estimates that in 2025, the percentage of EEA end-users who could be subject to sustainability derogations, hence not enjoy the full RLAH benefits is expected to remain practically unchanged (14.6% compared to 14.8% in the baseline).

Option 2 contains additional transparency measures on QoS, emergency services and VAS. As a result of these measures, consumers are likely to see an improved QoS and have a clear picture about the QoS they should expect when travelling abroad. Improving awareness on the expected QoS could help reduce consumer complaints. On the other hand, it cannot improve materially the RLAH experience by itself.

Awareness about the risk of bill-shocks from calls to VAS could reduce the risk of these bill-shocks. However, a transparency measure based on information provided only in contracts is likely to attract limited attention.

Increased awareness about alternative means of access to emergency services can help disabled end users that search for the information and pay attention to the "Welcome SMS". However, it is unlikely to have equal impact on users that do not pay attention to the message or to users that have opted-out and do not receive it. Most important however, the identified limitations in emergency communications will remain (see also section 2.1.3) and continue hindering access to emergency services. As a result, we do not expect a material impact.

[82] This is the total roaming margin of operators with negative sustainability.

Overall, the positive social and consumer's benefits impact remains modest with a high risk or derogations and the RLAH experience limited, with unsolved problems related mainly to QoS and emergency communications.

6.2.3 Impact on SMEs, Digital Single Market and innovation

SMEs are an important group of business end-users for roaming services and benefits from RLAH are maintained (e.g. productivity gains, increased usage of digital services by consumers etc), along with general business end-users benefits.

SMEs and especially start ups developing new applications, benefit from the possibility for consumers of using applications continuously, also while travelling, without fearing to incur high costs. This is particularly relevant e.g. for applications that offer mobility solution/accommodation/other tourism related services and all the applications that might be particularly interesting while travelling.

However, practically unchanged sustainability challenges compared to the baseline, maintain the risk of sustainability derogations, leading to risk for some end-users of not benefit from full RLAH and this would consequently reduce SME benefits.

Option 2 might facilitate innovation and completion on the market, but only to a limited extent. The clarification that the wholesale access obligation is technology neutral, would eliminate the current doubts on the market in this regard. It might facilitate access to 5G networks but it is not coupled with obligations on the home operator to ensure the same level of services as domestically. As a result, its impact largely depends on the cooperativeness of operators.

It is likely to partially facilitate the utilization of applications requiring access to certain technologies and associated facilities in the mobile network. It would indirectly support innovation by service and mobile applications providers, especially of those that should function seamlessly across the Single Market.

The above positive albeit small impact for enterprises and business users in the digital single market cannot be quantified.

6.2.4 Administrative burden and compliance cost

Option 2 introduces modest compliance costs, following the additional measures envisaged. In terms of administrative burden, it retains the reporting and monitoring mechanism as under the Roaming Regulation in force (see section 9). This not only saves the burden of new reporting processes but can benefit from the current experience to improve the efficiency, through the REFIT process.

Sustainability (A): It introduces a minor reporting requirement for operators (data on wholesale traffic exchanged in a non-discriminatory manner).

Quality of Service related measures (B1 and C1): The proposed measures (transparency and clarification on neutral access obligation for wholesale services) introduce a minor additional burden to operators and NRAs. Operators already have systems in place to manage their own customers' roaming traffic dynamically, to ensure the best QoS, as confirmed in the public consultation. As a result, the compliance cost will be minor. Similarly, NRAs already monitor the QoS offered while roaming, so they will not incur an additional enforcement cost.

Access to emergency communications services while roaming (B3): The proposed transparency measures imply a minor compliance cost for operators. An additional compliance cost comes from the need to inform subscribers that have opted-out from receiving the Welcome SMS. However, failure to ensure the same level of access to

emergency services while roaming as at home could have a considerable indirect cost that cannot be estimated. The inability to access emergency services could have a significant negative impact to the lives of travelers, including possible loss of life (see also section 6.3.1 on the impact of emergency calls to the lives of people).

Calls to VAS (B2 and C2): The proposed measures (transparency and publication of VAS number ranges at national level) have a minor impact on compliance costs and no impact on the administrative burden for operators. Also, they do not incur any additional enforcement costs for NRAs. The publication and update of information on VAS number ranges will have a modest cost for the NRAs (responsible for these tasks).

On the other hand, option 2 includes a minimum level of horizontal simplification (REFIT), including on the reporting process, so as to reduce compliance costs and the administrative burden of operators without compromising the collected data.

6.2.5 Environmental impacts

The proposed measures do not have substantial environmental impacts compared to the baseline, thanks to slightly reduced derogations it might only marginally improve roaming customers ability to enjoy full RLAH and use new generation and IoT mobile services while roaming. For example, it could also enable consumers to continue using their "smart home" applications, allowing them to save energy.

Therefore, we expect option 2 to have a slight positive environmental impact but we are not able to quantify it.

6.3 Impact of Option 3

6.3.1 Sustainable provision of RLAH and other economic impacts on operators

Option 3 will lead to a substantial reduction to wholesale caps as well as to actual wholesale prices. This will ensure cost recovery for the provision of wholesale services as described in Section 5.2.2, preserving incentives to invest in visited networks and avoiding distortion of domestic competition in visited markets. It will also further affect operators in different ways:

Inbounder MNOs will see their positive roaming margin reduce, as a result of the reduced wholesale prices, due to evolving competition dynamics, also in light of potential emergence of non-discriminatory trading. However, this reduction is in practice balanced, thanks to the anticipated increase in roaming traffic. When the caps set are above the costs, an inbound operator will always have a positive margin. As roaming traffic increases and estimated costs decreases, the caps set based on cost recovery will likely also decrease. Therefore, the margin between costs incurred and the cap set might shrink, but due to the increasing traffic, the inbound operator will balance the reduction of the cap by the increase in traffic.

On the other hand, outbounder MNOs and MVNOs will see their negative roaming margin decrease (and in some cases become positive), as a result of the reduced wholesale prices. For an outbound operator, any reduction to the cap will always have a positive effect on the roaming margin if traffic is unchanged, as outbound operators by definition has to purchase more roaming traffic than it can sell from its own network. With an increase in traffic, the outbound operator will on the one hand likely see decreasing caps but will at the same time also need to purchase more roaming-traffic to serve the increased demand from its customers. So while increasing traffic leads to reduced unit costs, there is some uncertainty for the marginal outbound operator as to how this effects sustainability. As operators are not allowed to charge extra for roaming consumption, they do charge for *overall* consumption, including roaming consumption. Therefore, when the share of roaming traffic to domestic traffic

increases, this might also affect how the retail revenue is allocated between roaming and domestic consumption. The outbound operator will therefore always be better off when wholesale caps decreases.

However, as a result of the reduction in the caps, operators might see their revenues from authorized roaming surcharges decrease (fair use policy retail revenues). This is due to the fact that rules on Fair Use Policies[83], are based on the level of wholesale caps and therefore the limitations that operators are authorized to apply in case of particularly advantageous offers (data allowances based on the open data bundles limit) and in case of pre-paid subscriptions are automatically increased with the reduction of the caps. Also the maximum fair use policy surcharge (equal to the wholesale cap) is automatically decreased with the reduction of the cap.

According to the sustainability analysis (see section 6.1), in 2023 the provision of RLAH would be unsustainable for 19% of operators (compared to 27% in the baseline). This marks a 22% improvement, compared to the results produced by the model for 2019 and indicates that option 3 can lead to a further decrease in the number of sustainability derogations[84]. . Sustainability improvements could lead to a reduction of the total negative roaming margin, compared to the baseline option by 42% in 2023 and 52% in 2025.These are, however, conservative estimates and competitive dynamics might further lower down wholesale prices and hence the sustainability challenge in reality might be smaller than what is indicated by the model.

Furthermore, the proposed solution for the European database for VAS number ranges foreseen in option 3 is expected to reduce losses from fraud and misuse and reduced bill-shocks from calls to VAS numbers. However, it is only a tool and it is up to the operators to use it in a way that can minimize the risk for (wholesale) bill shocks from calls to VAS numbers. Estimating and monetizing the actual impact is difficult. A modest 20% reduction to misuse could save European operators a median of 14,000 € per operator yearly.

6.3.2 Genuine RLAH experience and social impact

The expected positive impact on consumers' and business end-users capacity to benefit from RLAH is considerably improved compared to the baseline. Option 3 strengthens sustainability and contains additional measures at both retail and wholesale level to ensure an adequate RLAH experience and to have a positive social impact.

Subscribers of inbounder MNOs and MVNOs are less likely to need sustainability derogation (hence end-users are more likely to enjoy the full benefits of RLAH), thanks to the reduced wholesale prices and the ensuring improved sustainability. For business end-users this means less risk of having to pay for the use of on-line productivity and business tools while roaming. The Commission analysis estimates that in 2025, the percentage of EEA end-users who could be subject to sustainability derogations, hence not enjoy the full RLAH benefits could be reduced from 14.8% to 8.6%.

Those consuming substantial volumes while roaming and being at risk of facing fair use policy surcharges, will see a reduced cost for two reasons. Reduced caps cause thresholds used in the open data bundle and pre-paid fair use limits to drop, which means less amount of consumed data becoming subject to a fair use policy surcharge. The reduction in wholesale

[83] Commission Implementing Regulation (EU) 2016/2286, see also Annex 7.
[84] From 31 August 2018 to 31 August 2019, NRAs granted sustainability derogations to 24 operators.

caps would imply a 20% reduction of the maximum fair use surcharge for data from 1 July 2022 and an additional 25% reduction from 1 January 2025.

As a result of option 3 QoS measures, consumers are likely to see an improved QoS and have a clear picture about the QoS they should expect when travelling abroad. This can result in increased customer satisfaction and reduced complaints. According to the joint Commission/BEREC online survey, 18% of operators have received complaints that at most 3G was available and 22% have received complaints that full 4G speeds were not possible. The number of complaints could be reduced but we cannot quantify the relevant impact.

Consumers will also have better awareness about the cost of calls to VAS, thus, be less likely to face bill-shocks. This can in turn lead to reduced frustration from bill-shocks and fewer complaints that again cannot be quantified.

As regards social impacts, similarly to option 2, increased awareness about alternative means of access to emergency services can help disabled end-users in emergency situation reducing the baseline risks or not being able to use emergency services while roaming. In comparison to the baseline option and Option 2, this option is more likely to enable operators to offer equivalent access to emergency services like at home, including free of charge access and caller location (including handset based localization) that might be particularly important for e.g. end-users with exhausted pre-paid credit. This can have a major indirect benefit. We cannot give a specific estimation of live saved due to proposed measures, since it is not possible to estimate the number of cases where emergency communication in a roaming environment would be hindered. It is however, possible to give an indication of the average number of lives saved per year for every 100,000 mobile emergency calls. Just by implementing handset based Advanced Mobile Location (AML) average saved life per year is 0.45 and the average number of lives impacted every 100,000 mobile emergency calls is 4.37 (lives impacted are those persons that have a diminished or prevented injury as a consequence of accurate location).[85] Free of charge provision at wholesale level of the caller location transmission and wholesale level transparency, as proposed in option 3, would contribute to enabling of the presented benefits.

6.3.3 Impacts on SMEs, Digital Single Market and innovation

Option 3 substantially reduces risks of SME not being able to benefit from RLAH, as it quite effectively alleviates sustainability challenges. This implies a reduced use of sustainability derogations (compared to options 1 or 2), hence a reduced number of end-users that might be subject to (the small) derogation surcharges. This means that under option 3, consumers and business end-users will continue using digital services while roaming and that SME employees will continue to have access to on-line, corporate productivity and collaboration tools without any surcharges while roaming.

The QoS measures are likely to facilitate future needs linked to technology and innovation developments, while ensuring the widest possible use of 5G and minimization of the risk for end-users not being able to use certain applications requiring 5G technology while crossing

[85] HELP 112 II project cost benefit analysis. https://ec.europa.eu/digital-single-market/en/news/112-112-day-locating-emergency-calls-aml-technology-rise . The forecasted scenario is enabled by the legal obligation provided in Art 109.6 EECC of having the handset-based localisation deployed by 21 December 2020. This impact is relevant to the proposed regulatory measures insofar the delivery of handset based caller location is linked to ensuring that the transmission of caller location is free of charge for the end-user. Free of charge provision at wholesale level of the caller location transmission and wholesale level transparency, as proposed in option 3, would significantly contribute to enabling of the presented benefits.

borders. As such, a non-discrimination obligation would ensure a level playing field for the European mobile operators. Ultimately, the home operators are empowered to ensure that their subscribers enjoy the same QoS while roaming as at home.

For application providers and start-ups, including SMEs, this implies an increased possibility for consumers to use applications continuously based on an improved and known QoS, also while travelling, without fearing to incur high costs due to surcharges. This is particularly relevant for applications that offer mobility solution/accommodation/other tourism related services and all the applications that might be particularly interesting while travelling.

This option might bring additional indirect innovation benefits to developers and end-users of application that require high QoS, especially if those applications and services might operate exclusively on 5G networks. Enjoying the same QoS when travelling as at home could indirectly support the uptake of applications and services, that can function and be used seamlessly across the Internal Market, without cross border interruption. However, the above positive impact for enterprises and business users in the Digital Single Market cannot be quantified.

The proposed clarification of the possibility to use alternative, non-volume based tariff structures can offer clarity and contribute to the development of the wholesale roaming market for M2M communications (including agreements that allow permanent roaming) and related innovation benefits. However, its effectiveness remains to be proved, because it largely depends on the cooperativeness of operators. The foreseen reporting and monitoring activities on the M2M market will allow NRAs to develop expertise on this emerging market. The additional administrative burden for market players and member states is minimal, as it does not introduce new reporting and monitoring obligations.

6.3.4 Administrative burden and compliance cost

Option 3 introduces some additional compliance costs compared to the baseline and in addition to Option 2 following the additional measures envisaged:

Sustainability (A1): It introduces a minor reporting requirement for operators (data on wholesale traffic exchanged in a non-discriminatory manner).

Calls to VAS (B2 and C2): The proposed measures (transparency obligations and European database with VAS number ranges) have a minor impact on compliance costs and no impact on the administrative burden for operators. Also, it does not incur any additional enforcement costs for NRAs. The development and maintenance of the database will have an implementation cost for BEREC (responsible for both tasks) and a modest cost for the NRAs (responsible to update the database contents).

Access to emergency communications services while roaming (B3): The proposed measures imply implementation costs linked to amending wholesale roaming contracts, mostly linked however with the implementation of rights and obligations already defined in the European framework (EECC). Compliance costs relating to the transparency obligation are minor.

On the other hand, it includes horizontal simplification (already analysed under option 2), including on the reporting process, so as to reduce compliance costs and the administrative burden of operators (C3). It also introduces a lighter mechanism (a delegated act instead of a normal legislative procedure) for the potential future revision of wholesale caps. This is a substantial improvement, since by setting the parameters of pricing methodology in primary law, regulatory efficiency would be achieved by delegating the power to set the wholesale caps in accordance with this methodology to the Commission. If compared to a standard

legislative procedure a delegated act would reduce excessive administrative burden on all subjects involved.

Annex 3 gives an overview of measures of option 3 and costs stakeholders incur.

6.3.5 Environmental impacts

Option 3 will have a similar environmental impact as option 2, with slightly higher positive impact due to reduced derogations and improved consumers capacity to benefit from a genuine RLAH experience (including 5G) that makes it easier for them to use environmentally friendly mobile services and applications while roaming.

For example, roaming customers will be able to use increasingly new 5G and IoT mobile services connecting vehicles and road infrastructure (Cellular Vehicle-to-Everything or (C-V2X)[86], while travelling through other member States. This could prevent human casualties and increase traffic efficiency, reducing the cost per km of travel in urban areas, fuel costs, CO2 and other air pollution emissions, lower need to repair or recycle wrecked vehicles, with a smaller ecological footprint[87].

We expect option 3 to have a slight positive environmental impact compared to the baseline scenario.

6.4 Impact of Option 4

6.4.1 Sustainable provision of RLAH and other economic impacts on operators

Option 4 will lead to a substantial reduction to wholesale caps as well as to actual wholesale prices, while maintaining cost recovery for the provision of wholesale services. Its only difference with option 3 is the MNO obligation to pass any discounts they get on wholesale rates to MVNOs. This might improve MVNO sustainability (compared to option 3). Its impact on MNO cannot be measured with the available data.

This difference is reflected in the results of the sustainability analysis (see section 6.1), according to which, in 2023 the provision of RLAH would be unsustainable for 17% of operators (compared to 27% in the baseline). Sustainability improvements could lead to a reduction of the total negative roaming margin, compared to the baseline option by 45% in 2023 and 53% in 2025.However, this improvement might not happen, since it is based on an intrusive measure (MNO obligation to pass discounts on wholesale roaming tariffs to MVNOs). Indeed, hosting agreements can be subject to commercial negotiations or mandated by national decisions (e.g. dispute resolutions, remedies following approval of mergers, or even terms and conditions of procedures to award rights of use for spectrum). As a result, it is difficult to justify and implement. In addition, it will introduce substantial administrative overhead for both operators and member states, to monitor pricing and demonstrate the passing of discounts. Furthermore, it is not transparent and entails complex implementation and supervision resulting in substantially increased burden for market players and member states. Finally, it could have other negative repercussions that could effectively increase the

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[86] https://www.gsma.com/iot/wp-content/uploads/2019/08/Connecting-Vehicles-Today-and-in-the-5G-Era-with-C-V2X.pdf

87 IA accompanying the document "Commission Delegated Regulation supplementing Directive 2010/40/EU of the European Parliament and of the Council with regard to the deployment and operational use of cooperative intelligent transport systems: p. 17: summary of costs and benefits SWD (2019) 96 final of 13.3.2019 https://ec.europa.eu/transparency/regdoc/rep/10102/2019/EN/SWD-2019-96-F1-EN-MAIN-PART-2.PDF https://ec.europa.eu/transparency/regdoc/rep/10102/2019/EN/SWD-2019-96-F1-EN-MAIN-PART-1.PDF

roaming cost of MVNOs negating to some extend the anticipated gains. Examples would be including additional administrative or implementation charges (e.g. for reporting, negotiating wholesale rates, implementing FUP etc.) or requiring (possibly increased) commitments for purchasing wholesale roaming traffic (as is the case in direct negotiations of wholesale rates.

Concerning misuse, this option is practically similar to option 3 as both are based on establishing a central database with the VAS number ranges. The only difference (database open to the public under option 4 as opposed to operators and NRAs only under option 3) is unlikely to have an additional impact on misuse.

6.4.2 Genuine RLAH experience and social impact

We expect option 4 to have a similar impact on genuine RLAH experience as option 3 in general:

Concerning QoS, option 4 provides an additional measure (prohibiting the visited operator from deliberately offering lower quality of service than what can technically be offered). There is a slight additional positive impact, compared to option 3, that cannot be quantified.

Concerning VAS, option 4 requires opting-in to use VAS while roaming. The impact is considered similar to option 3. While we could foresee a stronger impact in terms of reduced frustration from bill shocks and complaints, the same measure would also hinder the use of VAS. This is equally likely to create frustration and complaints, reducing the overall impact as well as the benefit for consumers. According to the joint Commission-BEREC on-line survey of 2020, 16.4% of operators have received complaints for blocking calls to VAS. In either case we cannot quantify its impact.

Concerning emergency communications, option 4 includes an additional transparency measures, with an opt-in mechanism for additional information on available alternative means of access to emergency services. This constitutes a simple facilitation that cannot make a measurable difference, and might even reduce the impact since end-users might fail to opt in for this mechanism.

6.4.3 Impact on SMEs, Digital Single Market and innovation

We expect option 4 to have a similar impact on SMEs and on the Digital Single Market as option 3. It substantially reduces the risks of SME not being able to benefit from RLAH compared to the baseline (with even higher impact than option 3) and has equally positive impacts on innovation and use of innovative mobile services, based on latest technologies.

There is a difference, since Option 4 contains an additional obligation on home operators to request same QoS as at home, for all wholesale agreements. This could increase the number of networks in each country that can deliver the desired QoS. It could facilitate end-users to enjoy the expected QoS. However, this is not necessarily a bottleneck, as long as there is at least one network with sufficient coverage and offering the expected QoS.

In any case, the impact of option 4 for enterprises and business users in the Digital Single Market cannot be quantified.

6.4.4 Administrative burden and compliance cost

Option 4 introduces additional compliance and reporting costs compared Option 3. In terms of administrative burden, it retains the reporting and monitoring mechanism as under the Roaming Regulation in force (see section 9), however following the additional measures envisaged, mainly linked to the open access VAS database, and the additional MVNO measures, it increases considerably the overall reporting burden as explained below.

Innovation and Quality of Service related measures (B1 and C1): The option of not having a preferred network may be burdensome for the home operators as they would have to negotiate the same wholesale agreements with all operators that can technically fulfill the requested QoS level. It would limit bargaining power as well as the possibility of selecting the best wholesale offer. Overall, the proposed measures introduce a minor implementation cost for operators and a minor enforcement cost for NRAs but do not impact the administrative burden.

Access to emergency communications services while roaming (B3): The proposed measures imply increased implementation costs, mostly linked with the implementation of rights and obligations already defined in the European framework (EECC). Compliance costs relating to the transparency obligation are minor.

Calls to VAS (B2 and C2): The development and maintenance of an open access European database with VAS number ranges and tariff information. However, will have a substantial cost for BEREC (responsible for both tasks), especially due to the increased requirements (because of the open access). The inclusion of tariff information introduces a substantial additional cost for the NRAs (responsible to update the database contents) and a high administrative burden for operators that will have to report tariffs, as soon as they change.

Sustainability (A): The proposed measure (MNO obligation to pass discounts on wholesale roaming rates to MVNOs) will introduce complex and burdensome reporting requirements for both operators and NRAs. Its monitoring would require extensive reporting on the wholesale prices paid and the corresponding prices charged to MVNOs, where the linking between the two is not always straightforward. As a result, it can introduce a substantial increase to the administrative burden. Option 4 includes similar simplification gains (REFIT), as option 3.

6.4.5 Environmental impacts

We expect a similar impact as described for options 2 and 3, which cannot be quantified.

Table 3: Summary assessment of impacts of options compared to the baseline

	Option 2	Option 3	Option 4
Economic impacts			
Sustainable provision of RLAH and other economic impacts on operators	♦♦	♦♦♦♦	♦♦♦♦
Impact on SME, Digital Single Market and facilitate innovation	♦♦	♦♦♦	♦♦♦
Administrative burden and compliance cost	♦	♦♦	♦♦♦♦ see note
Consumers benefits/Social impacts			
Adequate RLAH experience of consumers	♦♦	♦♦♦♦	♦♦♦♦
112 & disabled end-users	♦♦	♦♦♦	♦♦
Environmental impacts			
Environmental impact	♦	♦	♦

Level of Impact:
♦ Minimum impact
♦♦ Small Impact
♦♦♦ Strong Impact
♦♦♦♦ Very Strong Impact
♦♦♦♦ for the Administrative burden the scoring indicates a negative impact with high, non-proportionate costs, higher the scoring, bigger the negative impact

7 HOW DO THE OPTIONS COMPARE?

7.1 Effectiveness

Proposed scoring: ● Minor contribution towards objectives, ●● Major contribution but without fully achieving objective, ●●● Achieving objectives.

Objective A: Sustainable provision of RLAH

Option 1 (the baseline) cannot contribute to ensuring the sustainable provision of RLAH. The sustainability challenges encountered under the baseline are described in detail in section 2.1.2. According to the Commission's sustainability analysis (see Annex 4A), in 2023 27% of operators are expected to have negative roaming margin exceeding 3% of their roaming margin. This figure is expected to increase to 29% in 2025. (score ●)

Option 2 makes a minimal contribution towards ensuring the sustainable provision of RLAH as explained in section 6.1.2. (score ●).

Option 3 contributes towards the sustainable provision of RLAH without however entirely eliminating sustainability challenges, as explained in section 6.2.2. This confirms the need of maintaining the safeguards mechanisms already included in the Roaming Regulation (derogations and Fair use policy). Competitive dynamics might however further lower down wholesale prices and sustainability challenges might be smaller than what is indicated by the model. (score ●●●)

Option 4 contributes towards the sustainable provision of RLAH without however, eliminating entirely sustainability challenges, as explained in section 6.3.2. Its impact is slightly better than that of option 3. However, it is based on a measure that is difficult to implement and monitor, which compromises its effectiveness and confirms the need of maintaining the safeguards mechanisms (score ●●●).

Objective B: Ensure a genuine RLAH experience for end-users

Option 1 cannot contribute towards ensuring a genuine Roam-Like-At-Home experience for end-users. The relevant challenges are described in detail in section 2.1.3. (score ●)

Option 2 cannot effectively contribute towards objective B. The relevant measures can improve end-user awareness but do not materially improve the RLAH experience and do not address the identified limitations in emergency communications, discussed in section 2. Furthermore, they do not reduce considerably the risk of end-users facing a sustainability derogation surcharge (see section 6.1.1). (score ●●)

Option 3 contains additional measures that can contribute towards improving RLAH experience. Thanks to measures under 3A, the risk of subscribers facing sustainability derogation is expected to reduce from 14.8% to 8.6%, while the maximum level of FUP surcharges for data will be reduced by 20% from 1 July 2022 and an additional 25% from 1 January 2025 (as a result of the reduction of the wholesale caps). Consumers are likely to see an improved QoS and have a clear picture about the QoS they should expect when travelling abroad, which can decrease complaints. They will also have better awareness about the risk of

calls to VAS, which can reduce bill-shocks and again decrease complaints. Finally, the proposed measures under option 3are more likely to enable operators to offer equivalent access to emergency services like at home, making a measurable impact to the quality of life, as explained in section 6.2.1. (score ●●●)

Option 4 is expected to have a similar impact on genuine RLAH experience as option 3 in general. The additional measures are expected to make only a minor difference, as discussed in section 6.3.1. and might go beyond what is necessary to achieve the objective satisfactorily (score ●●●)

Objective C: Ensure the same QoS as at home and access to all network technologies and generations, facilitate innovation and avoid misuse/fraud

Option 1 cannot contribute towards objective C. The relevant challenges under the baseline are described in detail in section 2.1.4. (score ●)

Option 2 cannot effectively contribute towards objective C. The impact of the measure on wholesale roaming agreements depends on the cooperation of operators, as it does not include any obligations on the home operators. Finally, the publication of VAS number ranges will be complex and potentially costly to use, because information on VAS will be dispersed in various sites/databases. As a result, several operators (especially smaller ones) might opt for not using it, which will limit its effectiveness. As also concluded in section 6.1.3, the positive impact of option 2 in this regard is small. (score ●)

Option 3 includes a set of measures that can contribute towards objective C. The proposed European database for VAS number ranges provides operators with a useful tool to combat losses from fraud and bill-shocks from calls to VAS numbers. Operators confirm this need in their responses to the public consultation. Also, according to the joint Commission-BEREC online survey, many operators have in fact sought to obtain information on VAS numbers and support this measure. The access obligation to all network technologies and generations empowers the home operators to seek the appropriate roaming agreements that can ensure the same level of QoS as at home, and the wide use of 5G technologies. The proposed clarification of the possibility to use alternative, non-volume based tariff structures can offer clarity and contribute to the development of the wholesale roaming market for M2M communications and related innovation benefits. However, its effectiveness remains to be proved, because it largely depends on the cooperativeness of operators. The foreseen reporting and monitoring activities on the M2M market will allow NRAs to develop expertise on this emerging market. (score ●●●)

Option 4 is equally effective as option 3, as regards objective C. The additional measure prohibiting the visited operators from deliberately offering lower QoS for roaming customers in the visited network than what can technically be offered, would introduce an additional level of safeguards to ensure that end-users are protected from QoS restrictions both from the home and visited operator, but a major limitation of this option is effective monitoring. The roaming end-user has a retail agreement with the home operator. The national regulatory authority of the roaming customer is not competent to monitor if the visited operator ensures any specific QoS level. Similarly, the regulator of the visited operator would not be able to monitor if the QoS offered is equivalent to what the roaming customer is offered by its home operator domestically. The main differences in the proposed measures are not expected to improve its effectiveness, as explained in sections 6.2.2 (additional features of database with VAS number ranges) and 6.2.3 (additional obligation on wholesale roaming agreements) and the option goes beyond what is necessary to achieve the objective satisfactorily (score ●●●)

7.2 Efficiency

Proposed scoring: ● Considerable additional costs non-proportionate to the benefits and difficult implementation ●● Neutral or Increase in costs proportionate to the additional benefits ●●● Increase in costs largely outweighed by the benefits

Option 1 is a simple continuation of the current Regulation. As a result it is straightforward to implement and does not incur any additional implementation costs. However, it also fails to reduce the administrative burden. At the same time, it fails to ensure the same level of access to emergency services while roaming as at home. This could have an indirect cost that cannot be monetized. The inability to access emergency services could have a negative impact to the lives of travellers including possible loss of life (see also section 6.2.1 on the impact of emergency calls to the lives of people) (score ●).

Option 2 introduces a set of rather light measures that are easy to implement and incur a modest compliance cost. Like option 1, it implies a major indirect cost (failing to ensure access to emergency communications while roaming). However, it introduces simplification measures that reduce the administrative burden. Overall costs and benefits are balanced (score ●●).

Option 3 introduces sustainability measures that are based on the continuity of the approach already tested since RLAH introduction in 2017 and strengthen efficiency. They bring important benefits in terms of reduced negative roaming margin overall and reduced cost for derogations requests. It also increases consumer benefits in terms of RLAH (due to fewer derogations and reduced surcharges – see also section 6.3.2). These benefits outweigh the cost of the measure. As explained in section 6.3.1, increase in inbound, wholesale traffic mitigates losses of wholesale revenues (due to the reduction of wholesale caps). Also, the reduction in wholesale costs outweighs the reduction of revenues from surcharges (also due to the reduction in the wholesale caps).

If the additional measures are implemented those impose new implementation and compliance costs (e.g. measures to ensure access to emergency communications as at home, the VAS database, QoS requirements). Unlike the previous two options, it does not imply indirect costs while also introduces additional simplification measures that further reduce the administrative burden. Overall, its benefits, in terms of reduced sustainability challenges, improved QoS, reduced risks from calls to VAS for both consumers and operators, and unhindered access to emergency communications outweigh the cost (score ●●●).

Option 4 introduces a number of measures that are difficult to implement, costly and complex to monitor, thus creating substantial implementation costs for both operators and NRAs (measures to ensure access to emergency communications as at home, MNO obligation to pass any discounts on wholesale prices to MVNOs, database on VAS number ranges including tariffs and open to the public). The additional measure introducing wholesale level obligation requiring the home operator to request the same QoS as offered at home, for all available networks in the visited country is considered overly burdensome for operators, in particular for smaller operators, both in terms of economic burden and the cumbersome process of setting up wholesale agreements. It would limit bargaining power as well as the possibility of selecting the best wholesale offer. It may lead to a situation where end-users have the option to select a visited network but are not aware of which network has the technical possibility to offer equivalent QoS as at home. For the reasons above, the additional regulatory safeguards of option 4 are not considered efficient.

Option 4 complements the proposed transparency measures of option 3 with an additional opt-in mechanism for receiving information on available alternative means of access to emergency services. While this feature ensures that end-users that are not interested in

alternative means of access are not overburdened with unsolicited information, it might even reduce the impact since also end-users that would need to use alternative means of access to emergency communication might fail to opt-in for this mechanism. Such an opt-in mechanism is more difficult to implement for operators, costly and complex to monitor, thus creating substantial implementation costs for operators without a corresponding increase of the effectiveness of the transparency measure towards end-users.

Overall Option 4, like option 3, it does not introduce indirect costs and reduces the administrative burden. However, the complexity and costs of the measures are not justified, and the option costs go beyond what is necessary considering the achieved impact (score ●).

7.3 Coherence and proportionality

Proposed scoring: ● Lack coherence and/or proportionality ●● Neutral ●●● Coherent and proportionate.

Option 1 is proportionate, as it is a simple continuation of the current Regulation in force. However, it fails to ensure access to emergency services as at home and to respond to technological and business developments. Therefore, it lacks sufficient coherence with existing policies, since it fails to complement the Accessibility Act and EECC measures on emergency services to ensure alternative access implementation in a cross border context. (score ●).

Option 2 is also proportionate, as it does not introduce any intrusive measure that might go beyond what is necessary to address the problems at stake. Like option 1, it fails to ensure a genuine RLAH experience due to derogations to RLAH reducing benefits for consumers and limitations in the access to emergency services as at home and fails to respond to technological and business developments, especially concerning 5G developments. Therefore, like option 1, it lacks sufficient coherence with existing policies, in particular with 5G strategies. (score ●)

Option 3 contains a set of measures that are neither intrusive nor disproportionate. In particular, the measures proposed are limited to those aspects, which have proved to be insufficiently addressed at national level and for which a harmonised approach is necessary, as explained in detail in the Subsidiarity grid, accompanying the legislative proposal (point 3.2). (score ●●●).

Option 4 includes measures that are intrusive and disproportionate. The obligation of MNOs to pass any discounts they get on wholesale roaming rates to MVNOs is intrusive and lacks EU added value. Hosting agreements between MNOs and MVNOs are governed at national level and NRAs have the necessary tools to address any relevant disputes. The measure prohibiting visited operators from deliberately offering lower quality of service for roaming customers, than what can technically be offered in the visited network goes beyond what is needed, as it could enable roamers to get better QoS than domestically. The same applies for the obligation on home operators to request same QoS as at home, for all wholesale agreements. (score ●)

Proportionality is reinforced for all options, because regulation is provided for a limited period: the Regulation will expire in June 2032. The 10-year duration takes into account that a decade is the typical duration to widely roll out a new generation of mobile communication and develop new business models. In a forward-looking manner, the competition is not expected to change significantly on the market in the next 10 years. The predefined duration is also based on the fact that the rollout of 5G “software-defined networks”, that allow slicing and could potentially have a profound impact on business models, requires the replacement of

core network elements and is expected to take more time than the first 5G rollouts. Finally, the 10 year duration aims to ensure certainty in the market and minimize regulatory burden[88].

Table 4: Comparison of the Options

		Option 2	Option 3	Option 4
Effectiveness	Objective A	●	●●●	●●●
	Objective B	●●	●●●	●●●
	Objective C	●	●●●	●●●
Efficiency		●●	●●●	●
Coherence and proportionality		●	●●●	●

Effectiveness scoring: ● Minor contribution towards objectives, ●● Major contribution but without fully achieving objective, ●●● Achieving objectives.

Efficiency scoring: ● Considerable additional costs non-proportionate to the benefits and difficult implementation ●● Neutral or Increase in costs proportionate to the additional benefits ●●● Increase in costs largely outweighed by the benefits.

Coherence and proportionality scoring: ● Lack coherence and/or proportionality ●● Neutral ●●● Coherent and proportionate.

For indications on the scoring system see above explanations under each criterion.

8 PREFERRED OPTION

8.1 Sustainable and genuine RLAH

Option 3 is, overall, the most effective, efficient and proportionate/coherent way of achieving the objectives as summarized in Table 4 without exceeding what is necessary. It scores highest on all dimensions of effectiveness, efficiency, coherence and EU added value.

Option 3 considerably improves sustainability results, reducing the number of operators with a negative roaming margin exceeding 3% of their domestic margin. It reduces the need for derogations, allowing an increased number of consumers to fully benefit from RLAH. It seeks to create the preconditions for operators to ensure the same QoS while roaming as domestically and it enables consumers to fully profit from technological development and 5G driven innovation. It seeks to address any lack of clarity on how operators can offer equivalent access to emergency services like at home and delivers useful tools for addressing (wholesale) VAS related misuse. Transparency measures have a positive impact on avoiding consumers' bill shocks from calls to VAS and end-users awareness on equivalent means of access to emergency services. As a result, it can contribute substantially towards a genuine RLAH experience and have a positive social impact. The measures proposed in Option 4 are considered overly burdensome and disproportionate as explained in Section 7 and are therefore not included in the preferred option. Additional regulatory safeguards of option 4 would not outweigh the complexity in ensuring the implementation of the proposed measures

and hence option 3 is considered sufficiently effective in addressing the problem related to ensuring a genuine RLAH experience.

While the administrative burden remains stable and is in fact reduced, thanks to the simplification initiatives, some of the proposed measures introduce additional compliance costs. For a detailed indication of how different operators, consumers, NRAs, BEREC, application providers and verticals are affected by the preferred option see Annex 3, that also includes an overview of cost an benefits of the preferred option. Stakeholders opinion on different measures is summarized in the synopsis report of the public consultation (See Annex 2).

Figure 8 below indicates how the measures included in the preferred option address the problems and objectives of this initiative.

Figure 8 The preferred option - Intervention logic

8.2 REFIT (simplification and improved efficiency)

As indicated in the Review report, the Roaming Regulation does not face substantial implementation problems as confirmed by overall compliance of mobile operators with the rules, the absence of infringement proceedings, the effective enforcement actions at national level and the small number of complaints (see Review report). As a result, the need for improvements in the current Roaming Regulation is limited, also because many of the costs to implement the monitoring and transparency systems linked to RLAH have been already sustained and only the additional cost of maintaining the system in place are to be considered.

The following simplification and efficiency improvement are proposed:

8.2.1 Revision of wholesale caps through delegated act

Instead of reviewing the whole Roaming Regulation when wholesale caps are revised, a lighter system could be introduced. A delegated act could be issued for the definition of wholesale caps e.g. based on an updated cost model (from 2026 onwards) and/or to possibly give a role to BEREC in the process, similarly to the delegated act for the Eurorate[89].

REFIT impact: Reduction of legislative costs

The measure would allow to lighten the heavy legislative process for reductions of the wholesale caps (after 2025) via amendments of the Regulation. In a context where the economic space for reductions becomes extremely limited if we respect the cost recovery principle, a standard legislative procedure might not be the most efficient procedure. By setting the parameters of pricing methodology in primary law, regulatory efficiency would be achieved by delegating the power to set the wholesale caps in accordance with this methodology to the Commission and reducing the administrative burden on all subjects involved

8.2.2 Repeal of the obligation for the separate sale of data roaming services (local data break-out),

Due to the lack of actual uptake by the market, local data breakout obligations no longer appear to be relevant. The provision obliging operators to provide separate sales of roaming data services at retail level shall be repealed, including the Commission Implementing Regulation (EU) No 1203/2012 of 14 December 2012 on the separate sale of regulated retail roaming services within the Union.

REFIT impact: The systems of providing the possibility for separate sales of data services have already been put in place and operators already sustained the costs for deploying it. The repeal of this obligation may not significantly reduce their economic burden but it may somewhat reduce the maintenance costs, as well as the burden of offering separate sales of data roaming services.

8.2.3 Repeal the Implementing Act on weighted average of maximum mobile termination rates

The Roaming Regulation provides for a surcharge on incoming calls based on the weighted average MTRs. The value is defined yearly by the EC in an implementing act based on input from BEREC. With the definition of the Eurorate (the single maximum mobile voice termination rate across Europe) this implementing regulation might be redundant. The Roaming Regulation could refer to the Delegated Act on the single weighted average MTRs directly.

REFIT impact: Such a change would reduce the burden on BEREC to provide input to the EC, as BEREC already has extensive reporting and data collection responsibilities pursuant to the Roaming Regulation (see also 8.2.5. on streamlining the monitoring obligations]).

[89] Delegated Act (a Delegated Regulation) under Article 75 of the European Electronic Communications Code, to be adopted by 31 December 2020.

8.2.4 Align the provision on how to determine maximum charges in currencies other than Euro

The Roaming Regulation sets out rules that oblige service providers in Member States outside the Eurozone to annually revise the maximum wholesale charges and retail surcharges for regulated roaming services and intra-EU communications.

The rule applied for intra-EU communications in accordance with Regulation (EU) 2015/2120 as amended by Regulation (EU) 2018/1971 sets out that the maximum charges in currencies other than the euro shall be revised annually and apply from 15 May using the average of the reference exchange rates published on 15 January, 15 February and 15 March of the same year. The roaming regulation will be aligned to those provisions defining the same date for revising the surcharge for roaming services (15 May instead of 1 May), and the same method for determination of those currencies.

REFIT Impact: The proposed measure would bring clarity and reduce the administrative burden of operators outside the Eurozone, who are obliged to publish their tariffs twice, when revisions of the roaming surcharges or intra-EU communications tariffs are introduced. Furthermore, it would reduce the monitoring burden for NRAs, which have to monitor the correct application of the revised exchange rates. Positive effects at retail level are expected, with retail prices updated once a year, instead twice as its currently the case, which can considerably reduce information obligation of operators for modified contract conditions.

8.2.5 Rationalize reporting monitoring obligations

To 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.

Additional means of simplifying the monitoring procedure through merging and streamlining monitoring process will be examined in cooperation with BEREC.

REFIT impact: Reduction of administrative costs for BEREC, NRAs, operators.

Table 5: REFIT cost savings for the preferred option

Description	***Amount***	***Comments***
Delegated Act for caps update instead of renewal of legislation	The difference between the typical cost of adopting a legislative act and the one for adopting a delegated act.	Reduced legislative cost (Council, European Parliament, Commission, BEREC and all stakeholders)
Removal of obligation to offer separate sale of roaming data services	Small but cannot be estimated	Operators have not been offering any such services. Still they will not need to maintain any more the systems they have implemented to support the separate sale of roaming data services.
Repeal of annual CIR on MTR	~15,000 € plus the typical cost of adopting a repetitive implementing act.	Reduced cost for BEREC and NRAs (data collection, preparation and submission of input to the Commission), estimated to 2 person days per member state per year plus two person days. Cocom (consulting on a repetitive implementing act), estimated to 0.5 person days per member state per year. The Commission (preparation and adoption of a repetitive implementing act)'
Alignment of provision on how to determine	~2,000 € plus any additional saving for reduced	Estimated saving of 1 person day per year per operator outside the eurozone.

maximum charges in currencies other than Euro	information obligation in case of changed contractual conditions	Do not take into account possible savings from NRAs monitoring activities.
Rationalize reporting obligations	~ 50,000 €	Reduced cost for operators (estimated 2 person days per operator per country), NRAs (estimated 0,5 person days per country), BEREC (not taken into account)[90]

9 HOW WILL ACTUAL IMPACTS BE MONITORED AND EVALUATED?

A well-established monitoring system is already in place. During the functioning of RLAH (from June 2017) the Commission and BEREC have used a wide number of indicators to assess the functioning of the roaming rules[91]. The monitoring system is based on data collected by the NRAs and BEREC, by means of semi-annual international roaming benchmarking questionnaires and an annual transparency and comparability questionnaire. Some indicators were also collected based on an annual joint Commission-BEREC online survey.

To monitor the effectiveness in reaching the additional general objectives illustrated in Section 4, the monitoring tools aim at assessing:

(a) The effectiveness of wholesale measures to ensure the sustainable provision of regulated retail roaming services and the smooth functioning of the roaming market.
(b) The extent to which European end-users enjoy a complete roaming experience while travelling, in particular regarding quality of service, access to emergency services and protection against bill shocks.
(c) Finally the interplay between technological innovations and RLAH.

The new measures introduced by the review would require number of additional indicators:

1. Quality of service indicators (e.g. number of roaming agreements by technological generation);
2. The extent to which roaming customers and operators face problems in relation to value added services
3. Roaming traffic negotiated in a non-discriminatory manner (trading platforms or similar instruments).
4. Indicators on the functioning of roaming in the context of the M2M market (number of M2M roaming agreements, M2M traffic, revenues and payments);

90 For the calculation, we have used labour costs from the Eurostat database and the number of operators per member states responding to the BEREC benchmarking questionnaire, as those are the operators that actually incur reporting costs.

91 Examples of such indicators are: Retail (outbound) roaming traffic (voice, SMS, data) as well as retail roaming traffic per roaming enabled subscriber and per roamer, Retail traffic subject to fair use policy / sustainability derogation / alternative tariff (as % of total roaming traffic in the EEA), Average actual wholesale prices charged per unit (for total, balanced and unbalanced inbound traffic) to the EEA, Average actual wholesale prices charged for roaming traffic to the rest of the world, Average retail roaming prices to the rest of the world, Number of complaints (by type of complaint)Derogations requested and granted, Number of operators applying each fair use policy, Domestic only subscribers (as % of total subscribers), Subscribers subject to derogation (as % of total roaming enabled subscribers).

The monitoring system already in place allows the effective monitoring of the roaming market and is well established, therefore it will not impose any additional burden either on operators or on BEREC and the NRAs. Specifically:

- BEREC will continue to collect data regularly from national regulatory authorities on the developments in the retail and wholesale roaming market, utilizing the Benchmarking questionnaire. .
- BEREC will report regularly on the evolution of pricing and consumption patterns in the Member States both for domestic and roaming services, the evolution of actual wholesale roaming rates for unbalanced traffic between providers of roaming services, and on the relationship between retail prices, wholesale charges and wholesale costs for roaming services. BEREC shall assess how closely those elements relate.
- BEREC will also collect information annually from national regulatory authorities on transparency and comparability of different tariffs offered by operators to their customers.
- The Commission and BEREC may continue the joint on-line survey, using it with parsimony and only when necessary, to avoid increasing administrative burden.

The current monitoring system does not address emergency communications, which are monitored through an annual CoCom questionnaire.

Furthermore, the Commission will collaborate closely with BEREC with the view to simplify the process and reduce the administrative burden for operators and NRAs. Elements that could contribute towards this end are:

- The timing of the data collection process,
- The data collection cycles (e.g. semi-annual or annual),
- The stability of the questionnaires, to ensure that operators are familiar with the data they need to collect and have established standard procedures for collecting them,
- An efficient quality control system at NRA and BEREC level, so as to minimise the need for resubmissions,
- Restricting ad-hoc questionnaires to the minimum necessary,
- Refraining from imposing reporting obligations to very small operators.