



Eutelsat's response to the Public Consultation on the draft BEREC Report on Satellite Connectivity for Universal Services

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Dear Sir or Madam,

Eutelsat welcomes BEREC's request to collect stakeholder's views in relation to its draft Report on Satellite Connectivity for Universal Service and is pleased to submit the following feedbacks and considerations.

General comments

Eutelsat is strongly convinced that current and forthcoming satcom solutions suit ubiquitous broadband connectivity needs for Universal Service in Europe.

As a preliminary and general comment, Eutelsat thinks that geostationary (GSO) and non-geostationary (NGSO) satellite networks and systems cannot be considered on an equal footing with respect to the 2022-2025 timeframe in delivering broadband services to end-users with appropriate customer premises equipment. The contribution of NGSO satellite constellations on the period considered should not be overestimated; there are very few operational NGSOs in Europe over the period considered.

While NGSO satellite constellations can provide low latency, universal coverage, GSO "Very High Throughput Satellites" (VHTS) today offer more affordable and cost-effective (cost-per-bit and total cost of ownership) services, for the benefit of individual end-users, albeit with higher latency.

Views on § 2.1.3. Product Pricing

Excerpt from the draft report, page 6: “Costs to European end-users (home use-case) varies greatly: between €40 to €60 (geostationary networks) or €99 (Starlink, LEO/NGSO) monthly costs plus €330 to €600 non-recurring costs for installation and wiring in Germany. [...] Furthermore, the electricity cost for customer premises equipment which can transmit to a satellite (not the same receive-only equipment such as direct-to-home TV antennas) is not negligible. In the case of Starlink, this can account for €300 per annum.”

The cost of a satellite solution is indeed to be assessed on the basis of recurring costs (monthly subscription) and fixed costs (Customer Premises Equipment – CPE, shipping and installation).

Generally, and as per today, GSO technology is by far less costly for the European end-users than NGSO’, making GSO the only connectivity solution through which an affordable EU Universal Service can be promoted everywhere in the EU.

Regarding recurring costs, we agree with the prices given in the text that seem to reflect the current state of the market. Starlink’s offer at 99 EUR per month is far more expensive than the prices charged in the European Internet Access market, particularly in Germany.

Furthermore, NGSO connectivity relies on higher energy-consuming CPEs than GSO’s ones – because they use phased array technologies and beamformed antennas.

As to non-recurring upfront costs for the European end-users, for the same technological reason mentioned above, GSO’s CPEs are in general less expensive than NGSO’s ones (e.g. Starlink’s kit sold at more than 600 EUR in France). In any case, potential subsidies provided by internet service providers must be deduced from CPE shipping, installation and wiring costs in order to come up with comparable figures. Indeed, GSO CPE wholesale price is much lower than NGSO’s (range of one to four).

Excerpt from the draft report, page 6: “GSO solutions tend to restrict monthly data volumes to around 50 GB/month in the basic offering (no real flat rate), while Starlink provides > 100 GB/month.”

As to the question of monthly data volumes, most wireless shared media (terrestrial mobile networks, GSO and NGSO networks) apply throughput limitations when the committed data allowance is reached. In this situation, the connection offered by GSO satellites does not stop but might work with a lower throughput at peak periods (throttling) in favour of users still within the committed data allowance. This is done to ensure a fair sharing of resources among end-users, and all the essential services of the USO remain available in this condition.

In fact, the current retail offers in Germany and in the UK, as well as the offers marketed by Orange in France (through its subsidiary Nordnet), based on the Eutelsat Konnect launched in January 2020, do not include any hard cap on data consumption, but rather the soft cap mechanism explained above, which does not prevent end-users from using the connectivity at maximum speed in off-peak periods.

Regarding the committed data levels, statistics shows that Eutelsat subscribers in France (where Eutelsat has its largest customer base) hardly reach their allowance, since the observed average consumption per subscriber is 30 GB with the Nordnet 50 Offer, which is marketed with a priority data allowance of 75 GB and 50 GB with the Nordnet 100 Offer,

which is marketed with a priority data allowance of 150 GB.

Similar results can be observed on other markets, which tends to indicate that priority data allowance levels are designed in line with user needs.

Finally, the forthcoming VHTS (e.g. the Eutelsat Konnect VHTS due to launch in September 2022) will greatly improve the resources available over Europe, and accordingly the priority data allowance.

Views on § 2.1.6. Service quality

Excerpt from the draft report, page 7: “The impact of latency (nearly 600 ms round-trip-delay for geostationary satellites) has an impact on quality of service and the smooth running of applications over GSO systems. Reduced call quality (mouth-to-ear delay) is recognizable when using GSO communications and other uses like remote work, VPN or cloud services might suffer negatively from high round-trip-delay.”

The effect of latency on interactive services is constant and depends on how delay-tolerant the services are.

Mouth-to-ear satellite round-trip-delay on standard interactive voice and video services is less and less noticeable or annoying thanks to the improvement in the quality of the signal itself.

As to data services, if arising, potential end-to-end performance degradation (in terms of effective bitrate) of some applications is not due to the high round-trip-delay alone, but to the large “available bitrate x round-trip delay” product (which applies to all networks, not only GSO’s). This is due to the behaviour of some communication protocols such as TCP using flow control windows.

At application level, e.g. for remote work or cloud, no degradation occurs when using TCP acceleration (a series of techniques for achieving better throughput on a network connection than standard TCP achieves, without modifying the end applications). Current satellite networks infrastructures providing broadband internet access adopt TCP acceleration.

In some specific and limited cases of encrypted links, namely where the TCP packet header is also encrypted on top of the TCP packet data (this is the case of IPsec VPNs), the accelerator is unable to detect TCP packets and prevent the effective bitrate degradation in a network with a large available bitrate x round-trip delay product.

In any case, the most advanced high-throughput GSO systems in use today provide end-users with satisfactory or acceptable Quality of Experience for the typical applications of a universal service, including standard-quality audio and video calls, as indicated by the European Commission in the Annex 5 of the Directive establishing the European Electronic Communications Code (EECC, 11 December 2018).

Views on § 2.2.1. Capacity demand estimates

Excerpt from the draft report, page 8: “The estimate is that the remaining addressable market for satellite solutions out of more than 50 million households and businesses in Germany would accumulate to around 100,000 customers, which cannot be served by terrestrial means within the foreseeable future.

Eutelsat’s view of the German addressable market by 2030 is somehow higher.

Views on § 2.2.2. Available capacity

Excerpt from the draft report, page 8: “The existing customer base for satellite end-user products for universal service access was around 23,000 in 2021 but increase is expected to come in in Germany and also elsewhere in Europe with the availability of Eutelsat CONNECT VHTS, ViaSat-3, StarLink, etc. in the coming years 2022-2024”

Please note that the correct spelling is Eutelsat “Konnect VHTS” and not Eutelsat “CONNECT VTHS”.

Views on § 2.2.3. Trends – Case Study (Germany)

Excerpt from the draft report, page 9: “Figure 4: Maximum capacity of GSO satellites over Germany in 2021-2025”

Please note that the figures for Eutelsat Konnect VHTS are underestimated: the maximum capacity available in Germany is rather in the range of 25 Gbps (20 Gbps in the forward channel and 5 Gbps in the return channel) and not 10 Gbps.

Views on § 2.3. Some regulatory considerations for Satcom based universal services

Excerpt from the draft report, page 10: “The use of Satcom based universal services needs resolution of several pre-conditions”

The use of universal services based on satcoms requires the removal of barriers and the simplification of rules in order to create a regulatory framework conducive to a uniform implementation throughout Europe.

- Implementation of CEPT decisions favouring the harmonization of spectrum usage and exemption of individual licenses for terminals.
- Removal of requirement for transit of traffic through national gateway, to simplify operations and reduce costs of deployment of satellite network.
- Designation of spectrum dedicated to satellite service and not shared with terrestrial networks, to not impair the deployment of terminals with unnecessary coordination constraints and favour the provision of Universal Service.

Excerpt from the draft report, page 11: “As a result, BEREC observes that there is a large national dimension to each of the regulatory issues identified, which supports a case-by-case approach to Satcom solutions for universal service.”

Terrestrial-based broadband deployment is a highly local process rightfully involving regions and Member States, because:

- building ground network implies right-of-way and digging permits, construction or lease of antenna and local node sites, compliance with local planning, coordination with other utilities, local geographical and socio-demographic knowledge, etc.
- even a small region will typically be able to aggregate large numbers of end-users, hence achieving a certain critical mass to ensure the necessary economies of scale for procurement, deployment, management and operation.

For satellite connectivity neither of the considerations above holds:

- it does not need a local backbone network connecting the last mile loop to the national / international network.
- it can serve a number of users scattered over a relatively large area (national or continental) with a cost which is independent of end-user location. In this respect, it is particularly suited for large and extremely sparsely populated areas. Conversely, for any particular regional area, the number of users suited to a satellite broadband solution may be relatively small.

Consequently, economies of scale in purchasing services are hard to secure, potentially making procurement uneconomic for either the regional administration and/or the local providers. Whereas across larger geographies (national or supranational, e.g. European level), benefits from collective procurement can be realised together with a more strategic approach to the rollout of broadband.

Therefore, there is potential for a coordinated approach between Member States for grouped investments in satellite-based broadband access to ensure critical mass in the numbers of connections involved. This would also leverage the better technical know-how and market knowledge available at pan-European levels. Based on this joint framework procurement, regional authorities can then administrate the deployment, based on their knowledge of the local geographical and socio-demographic situation and compliant with the laws and regulations of each country.

Views on § 3.1.1. Overview

Excerpt from the draft report, page 13: “Main disadvantages stated would be price and the availability of end user equipment.”

The cost of satellite end-user equipment (few hundred euros) must be compared to the cost of connecting households by terrestrial means, which can exceed a few thousand euros per connection in remote, low population density areas.

In fact, the CPE is the only missing element needed to quickly establish a satellite broadband connection everywhere in the territory (the installation and activation of a CPE can be undertaken in a few days).

Different commercial models exist to mitigate the inherent upfront cost of satellite equipment (typically €250-300) and installation (typically €100-150). As an example, offers based on Eutelsat Konnect in Germany currently include free CPE and its installation, with an activation fee of 1€ only. In France, Orange (through its subsidiary Nordnet) proposes CPE rental at 8€/month, and the CPE can even be fully subsidised by the French Government for households living in the most rural areas. In general, public subsidies could cover the purchase costs of terminals, thus significantly reducing the cost for the European end-user.

As to availability of satellite end user equipment, no problems have been reported to Eutelsat during several years of operation.

Views on § 3.1.3. Q2: Projected Satcom capacities

Excerpt from the draft report, page 15: “2 of those countries (LI, NL) note, however, that retail prices would probably not meet the affordability criteria”

Eutelsat is not familiar with exact affordability thresholds in these countries. However, based on publicly available information, the cost of a satellite internet connection is not expected to be higher than a terrestrial connection in these countries.

Excerpt from the draft report, page 16: “Although contracts with sufficient monthly volume are available from all three providers, the monthly data volume included in most of the contract options offered is lower than the need determined for normal usage.”

Eutelsat disagrees with this statement.

The current retail offers in Germany and in the UK, as well as the offers marketed by Orange in France based on the Eutelsat Konnect launched in January 2020, include no hard cap on data consumption, but rather the soft cap mechanism explained in § 3.1.3, which does not prevent end-users from reaching the maximum speed during off-peak periods.

Regarding the committed monthly volume, statistics shows that Eutelsat subscribers in France (where Eutelsat has its largest customer base) hardly reach their allowance, since the observed average consumption per subscriber is 30 GB with the Nordnet 50 Offer, which is marketed with a priority data allowance of 75 GB and 50 GB with the Nordnet 100 Offer, which is marketed with a priority data allowance of 150 GB.

Similar results can be observed on other markets, which tends to indicate that priority data allowance levels are designed in line with normal user needs.

Finally, the forthcoming VHTS (e.g. the Eutelsat Konnect VHTS due to launch in September 2022) will greatly improve the resources available over the EU, thus enhancing the priority data allowance.

§ 3.1.5. Q4: Improvements to be expected in Satcom

Excerpt from the draft report, page 19: “Although cost reductions can be expected, some NRAs (SE, DK, CZ, RS, SK) pointed out that Satcom will still be a relatively expensive technical solution unable to compete cost-wise with fixed and mobile broadband services.”

The cost of satellite end-user equipment (few hundred euros) must be compared to the cost of connecting households by terrestrial means, which can exceed a few thousand euros per connection in remote, low population density areas.

In fact, the CPE is the only missing element needed to quickly establish a satellite broadband connection everywhere in the territory (the installation and activation of a CPE can be undertaken in a few days).

As seen from the end-user perspective, the cost of a satellite solution is indeed to be assessed on the basis of both recurring costs (monthly subscription) and fixed costs (Customer Premises Equipment – CPE, shipping, installation and wiring).

As to the monthly subscription, as mentioned in Eutelsat’ views on § 3.1.3, the price of satellite retail offers is largely in line with typical prices for fixed terrestrial broadband in Europe. Offers in each country are designed jointly with local partners to ensure that they are compatible with local purchasing power on the one side, and with the requirements of the end users on the other.

Regarding fixed costs, as mentioned in Eutelsat’ views on § 3.1.1, the inherent upfront cost of the CPE is typically €250-300, and installation and activation cost is typically €100-150. Different mechanisms exist to mitigate these costs to an end-user, such as subsidies provided by the dealer in exchange for a customer commitment, or public subsidies.

Views on § 3.1.6. Q5: other relevant dimensions

Excerpt from the draft report, page 20: “Netherlands stated that the availability of (artificial) cheap Satcom offers may slow down the extension of coverage of fixed and mobile networks in rural areas.”

Eutelsat strongly disagrees with this statement.

The inclusion of affordable and quickly available satellite connectivity among solutions providing broadband access as a universal service is indeed a quick and cost-efficient measure to accelerate the take-up in European white areas with no or poor connectivity.

Bringing a significant improvement in connectivity in these areas, satellites act as a precursor, fostering the development of digital education and skills that will create favourable conditions for the deployment of terrestrial fixed and mobile networks in these areas in the medium-long term.

Views on § 3.1.7. Q6: Availability of satellite capacity (for universal service)

Excerpt from the draft report, page 21: “In addition high pricing of the customer premises equipment together with monthly fee for the sufficient throughput could be an issue in future implementation.”

The cost of satellite end-user equipment (few hundred euros) must be compared to the cost of connecting households by terrestrial means, which can exceed a few thousand euros per connection in remote, low population density areas.

In fact, the CPE is the only missing element needed to quickly establish a satellite broadband connection everywhere in the territory (the installation and activation of a CPE can be undertaken in a few days).

Eutelsat recommends that public subsidies are made available to cover the upfront cost for the end-users for the CPEs and their installation and activation.

Views on § 3.1.8. Q7: Meeting needs with existing capacity

Excerpt from the draft report, page 22: “The increase in the coverage of areas not yet covered implies higher investment costs, either because they are far from the transmission networks already deployed, or because they are areas of complicated terrain which require the installation of more network elements than in other areas commercial satellite projects can be a potential solution to bring broadband connection everywhere.”

Eutelsat fully agrees with this statement.

The incremental cost of rolling-out terrestrial infrastructures is driven by civil engineering costs (implying right-of-way and digging permits, construction or lease of antenna and local node sites, compliance with local town planning, coordination with other utilities), which may push any return on investments to a horizon of many years in remote areas, with hard geomorphological conditions and scattered users.

Thanks to the recent introduction of new, accessible, and affordable pan-European satellite connectivity services, satellite solutions can improve broadband take up in these areas, because:

- The cost of providing a broadband connection is fixed and not dependent on the geographic location of the users or their distance from nearby infrastructure. For this reason, in some specific areas, satellite is the most cost-effective solution.
- Broadband satellite solutions can be rapidly deployed.
- Satellite broadband facilitates demand aggregation at Member State or multi-Member States’ level (see next section).

Views on § 3.1.9. Q8: If there’s a needs gap, does a coordinated approach between Member States make sense

Excerpt from the draft report, page 23: “Coordinated approach between Member States could make sense to create the additional capacities.”

Eutelsat agrees that a coordinated approach between Member States could be beneficial to a widespread adoption of satcom solutions to provide ubiquitous broadband connectivity within the scope of Universal Service.

As already mentioned in Eutelsat's view on § 2.3, terrestrial-based broadband deployment is a highly local process rightfully involving individual regions and Member States, because:

- building ground network implies right-of-way and digging permits, construction or lease of antenna and local node sites, compliance with local planning, coordination with other utilities, local geographical and socio-demographic knowledge, etc.
- even a small region will typically be able to aggregate large numbers of end-users, hence achieving a certain critical mass to ensure the necessary economies of scale for procurement, deployment, management and operation.

For satellite connectivity neither of the considerations above holds:

- it does not need a local backbone network connecting the last mile loop to the national / international network.
- it can serve a number of users scattered over a relatively large area (national or continental) with a cost which is independent of end-user location. In this respect, it is particularly suited for large and extremely sparsely populated areas. Conversely, for any particular regional area, the number of users suited to a satellite broadband solution may be relatively small.

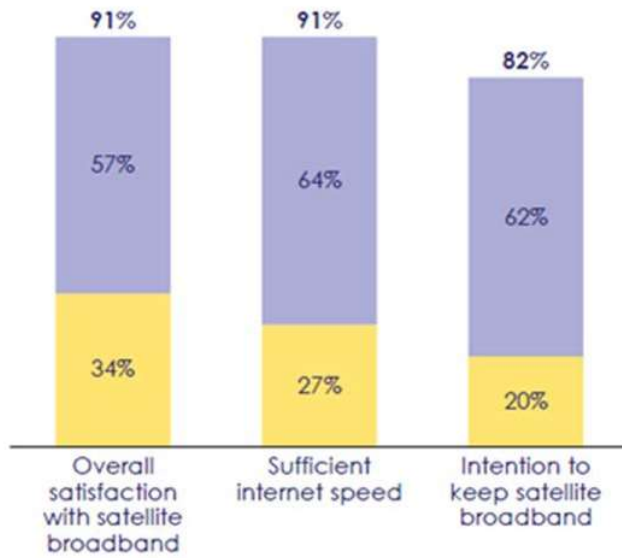
As a consequence, economies of scale in purchasing services are hard to secure, potentially making procurement uneconomic for either the regional administration and/or the local providers. Whereas across larger geographies (national or supranational, e.g. European level), benefits from collective procurement can be realised together with a more strategic approach to the rollout of broadband.

Therefore, there is potential for a coordinated approach between Member States for grouped investments in satellite-based broadband access to ensure critical mass in the numbers of connections involved. This would also leverage the better technical know-how and market knowledge available at pan-European levels. Based on this joint framework procurement, regional or national authorities can then administrate the deployment, based on their knowledge of the local geographical and socio-demographic situation and compliant with the laws and regulations of each country.

Excerpt from the draft report, page 24: Some GEO based capabilities exists, but their QoS or availability are insufficient.

Eutelsat disagrees. Statistics (such as the one here below) shows that the level of satisfaction of end-users for the broadband connectivity services proposed on its Konnect satellite is high.

Satellite Broadband records high levels of satisfaction



■ Satisfied / Agree
■ Very satisfied / Strongly agree



Source: BVA 2020
Base: 196 Satellite broadband homes in the UK, Germany and Ital