

## ESOA RESPONSE to DCMS CONSULTATION

### Strategic Priorities for telecommunications, the management of radio spectrum and postal services

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Statement of Strategic Priorities Consultation  
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#### Introduction

As a trade association, the EMEA Satellite Operator's Association (ESOA) welcomes the opportunity to provide responses to the UK Department for Digital, Culture, Media and Sport (DCMS) on their consultation about the strategic priorities for telecommunications and the management of radio spectrum.

ESOA is a non-profit organisation established with the objective of serving and promoting the common interests of EMEA satellite operators. The Association is the reference point for the European, Middle Eastern, and African satellite industry and today represents the interests of 30 members, including satellite operators who deliver information communication services across the globe as well as EMEA space industry stakeholders and insurance brokers. ESOA members are particularly involved in the discussions on spectrum identification for 5G mobile terrestrial systems, since several frequency bands targeted in Europe or at the International Telecommunications Union (ITU) level are essential for satellite communications.

ESOA believes that if the UK has decided to become a 5G world leader and deploy Gigabit connectivity across the country, the Government should strive to foster markets that are accessible to all and allow the innovative use of all technologies. ESOA therefore expects the UK Government to involve actors of all technologies to contribute to the building of the 5G ecosystem, whether for Fixed or Mobile connectivity, whether by wireless or wireline means.

For satellite operators to be able to enter the so-called 5G market, it is important there is a legal and regulatory structure that enables the deployment of a holistic mixture of different technologies to allow the provision of new services, improvements in quality and availability of lower prices. 5G is not just the next Mobile Generation or next "G" but is intended to be based on all technologies (not just terrestrial): as part of the EU research aimed at fostering Europe's technological know-how and industrial leadership in 5G networks, it has been clearly highlighted that the future 5G network architecture relies on "virtual network architectures supporting tailor-made network slices as well as

heterogeneous networks, i.e. a ‘network of networks’ including satellite networks.”<sup>1</sup> This needs to be emphasized within the UK telecommunications strategy to ensure the accomplishment of “an effective policy and regulatory framework in place for the secure and resilient deployment of new fixed and 5G networks.” (From Executive Summary)

ESOA believes that in order to realise a viable 5G ecosystem with ubiquitous coverage, the integration of satellites into 5G networks at an early stage will be critical to make it seamless.<sup>2</sup> As well as extending the reach of 5G terrestrial systems, satellite communications will be essential for an invisible and resilient overlay for terrestrial networks to help realise the vision for a ‘Gigabit Society’; a society in which millions of connections between people, devices, and things will require inter-connectivity and stability at unprecedented levels that terrestrial networks alone cannot deliver for Europe’s citizens.

As regards to the specific role of satellite in 5G, ESOA is pleased to reference our White Paper available on ESOA website in the following [link](#).

ESOA also invites the UK Government to include satellite technology in their National Broadband Plan. As such, it is essential to add a strategy or specific goal on satellite solutions for the hard to reach or isolated regions of the UK. National Broadband Plans need to recognize satellite technology as an essential element to provide broadband access to rural, remote or geographically challenged areas.

ESOA is here below proposing responses to the two questions from DCMS.

**1. Do you agree with the Government’s strategic priorities and desired policy outcomes for telecommunications, the management of radio spectrum and postal services?**

UK Government has identified 4 strategic priority areas, two of which are of utmost interest to the satellite communications sector: World-class digital infrastructure and Secure and resilient telecoms infrastructure.

**A. World-class digital infrastructure**

*The Government’s commitment to world-class digital infrastructure for the UK, reflecting the conclusions of the Future Telecoms Infrastructure Review*

UK Government has identified very ambitious connectivity priorities for the country in the 10-15 years to come. ESOA is convinced that satellite communications can play a key role in accelerating and extending the reach of this connectivity over the UK territory.

Satellite communications already today delivers mobile backhaul, push data services, linear and non-linear TV, converged media, broadband services and many M2M services that will be part of the 5G ecosystem in Europe and worldwide. In the future, consumers of 5G services will also expect to be able to use their devices on board aircrafts, ships and vehicles and in remote areas; and the continuity of 5G networks will be critical in times of natural disasters or terrestrial network outages. Satellite communications is a means to support these important aspects of 5G deployment scenarios.

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<sup>1</sup> <https://ec.europa.eu/digital-single-market/en/research-standards>

<sup>2</sup> e.g. through the standar3GPP release 16 available from: <https://www.3gpp.org/release-16>

There are several characteristics of satellite technology that make it well suited to supporting future networks:

- **Reach** – With a single geostationary orbit satellite it is possible to provide communications over the entire European region. This capability allows satellite to act as a back-up for terrestrial communications, and deliver services solely by satellite. A small constellation of medium-earth orbit satellites can also ensure a very large coverage of Europe, up to 50-60 degree North latitude and higher
- **Scalability** – Using broadcast technology, a single geostationary orbit satellite can simultaneously deliver a range of services, from software updates to video content, directly to end users. This significantly reduces costs for manufacturers and content providers
- **Ready for Launch** – Only a fraction of major transport corridors in Europe have complete 4G coverage at present. (See National Infrastructure Commission, Connected Future (London, 2016), available at <https://www.nic.org.uk/wp-content/uploads/Connected-Future-Report.pdf>) By comparison, satellite communications companies already have satellites ready to deliver service, once vehicles are fitted with new antennas and related communications equipment

ESOA has the following comments on the Government's priorities.

Greater regulatory clarity and stability: ESOA commends the UK Government for its commitment to competition and investment in the telecommunications sector. In particular, we note the Government's desire to *ensure greater regulatory stability and clarity through at least five-year market review periods* (para 22). Our sector vitally needs stability and predictability, given the lifetime of satellites (typically 15-20 years) and long investment cycles.

Broadband Universal Service Obligation (USO): ESOA notes that: *Government has a commitment to ensuring the universal availability of decent broadband services, with a minimum download speed of 10 Mbps.*

ESOA agree with the general approach UK Government is taking but also notes the prevalence given to Fibre and Mobile (terrestrial) technologies. It is to be reminded that Ofcom in its 2017 Satellite Strategy Statement<sup>3</sup> identified the ongoing development of satellite broadband services to play an increasingly prevalent role in providing broadband to large populations – both rural and urban - in the coming years.

The role of satellite in delivering broadband: It is extremely important that when assessing the various technologies this is based on **existing capabilities and current investments into future capabilities**, especially in the ICT / communications sector that is so fast in innovation. UK Ofcom again recently has assessed that satellite is incapable of delivering 10 Mbps download and 1 Mbps upload,<sup>4</sup> but this evaluation was erroneously based on their initial work on the broadband USO, back in 2016.

Within the last 3-4 years, the satellite industry has gone through major changes. There are currently a number of geostationary satellite orbit (GSO) and non-geostationary satellite orbit (NGSO) systems offering connectivity rates (far) better than these. Moreover, the advent and current operation of several High Throughput Satellites (HTS) with very small and reconfigurable beams, with extremely

<sup>3</sup> [https://www.ofcom.org.uk/data/assets/pdf\\_file/0030/96735/Statement-Space-Spectrum.pdf](https://www.ofcom.org.uk/data/assets/pdf_file/0030/96735/Statement-Space-Spectrum.pdf)

<sup>4</sup> [https://www.ofcom.org.uk/data/assets/pdf\\_file/0024/129408/Consultation-Delivering-the-Broadband-Universal-Service.pdf](https://www.ofcom.org.uk/data/assets/pdf_file/0024/129408/Consultation-Delivering-the-Broadband-Universal-Service.pdf)

high frequency re-use factors, increase the space-to-Earth delivery speeds even further to a point where satellite communications match terrestrial capabilities.<sup>5</sup>

Recently deployed and upcoming NGSO systems can also provide low-latency connectivity capable of supporting a wide range of applications. Advances in satellite construction and competitive pressures are reducing the costs of these services for users. Furthermore, as satellite individual antennas continue to become cheaper, smaller and more power efficient, a wide variety of terminal technology is being made available including small and flat panel antennas (e.g. so-called phased array antennas).

**Given the underlying assumption that remains of the past, ESOA would therefore urge the Government to carefully reconsider the potential role that satellite broadband can play in establishing an effective USO.** This is particularly the case since it acknowledges that a significant proportion of households which come within the scope of the USO are rural – locations which satellite has a clear technical advantage in serving.

Gigabit society: ESOA notes that: *Government has a longer-term ambition for the nationwide availability of gigabit-capable networks by 2033, and: there will be areas -around 10% of UK premises -where it will not be commercially viable to deploy networks. The Government will pursue an ‘outside in’ strategy to support the deployment of networks in these hard to reach areas.*

The satellite industry is very interested to hear more about the UK Government ‘outside in’ strategy to deploy gigabit connectivity across the country. **Post 2020, Very High Throughput Satellite (VHTS) systems are expected to enter service offering Terabit/s capacities,** with far more flexible solutions to better match traffic distributions, accommodate more demand per beam and support dynamic service delivery in truly providing gigabit connectivity to individual users. Our industry’s developments can thus help to achieve the Government’s targets of gigabit capable connections to 15 million premises by 2025, and nationwide coverage by 2033.

Mobile and 5G: ESOA notes that: *Government’s strategic priorities to extend geographic mobile coverage to 95% of the UK by 2022, and for the majority of the country to have 5G coverage by 2027, and: coverage levels are poorer in rural areas (in some cases significantly poorer), and some transport modes like road and rail also face particular challenges.*

Whereas UK still needs to complement its 4G coverage, satellite communications can provide an invisible and resilient overlay for terrestrial networks. **Satellite backhaul is being used extensively today in several regions of the world to support MNO’s efforts to extend their network coverage, both for cellular and mobility applications.** Given the technological and business options available for using satellite backhaul and recent technology innovations such as HTS satellites and new constellations of lower orbit satellites, there is good reason for MNOs to make more intensive use of satellite service for backhaul.<sup>6</sup>

With the advent of next generations of satellites in the near future (e.g. OneWeb already launched 6 NGSO satellites in 2019 with an expected constellation by 2020, SES is about to launch 4 more NGSO satellites for O3b in 2019 plus another 7 NGSO satellites for O3b mPOWER in 2021), such backhaul facility will have the capability to further include 5G.

<sup>5</sup> Intelsat’s 37e HTS has just been successfully launched, SES-O3b has provided Gigabit connectivity for years and other satellite operators (including Avanti and Inmarsat) are designing and launching very powerful spacecrafts

<sup>6</sup> LTE demo over satellite: [https://www.youtube.com/watch?v=E\\_ciTR02IC8](https://www.youtube.com/watch?v=E_ciTR02IC8)

ESOA is pleased to reference its paper on Connectivity Through Backhaul:  
<https://esoa.net/Resources/Connectivity-through-Backhaul-GSC-version.pdf>

ESOA also notes that as part of the four strategic priorities to guarantee a mobile / 5G coverage, UK Government has identified:

- *Fund new 5G use-cases through the Government's £200 million 5G Testbeds and Trials Programme; and*
- *Promote new 5G services from existing and new players, through the release of additional spectrum.*

**ESOA encourages the UK Government to seriously consider the involvement of satellite technology in their 5G test / trial programme.** The satellite industry is actively participating to the EU Commission and European Space Agency (ESA) R&D programmes on 5G and is successfully demonstrating the benefits of its full integration into the 5G network architecture.<sup>7</sup>

As regards radio spectrum, ESOA is supportive of the leadership from policy makers in the UK and the rest of Europe on 5G policy priorities. It is simply our primary concern to ensure the measures taken to release spectrum for 5G in Europe do not prejudice existing frequency users or impact current and future service offerings. On this regard, ESOA has several comments which are presented in response to Question 2 below.

***B. Secure and resilient telecoms infrastructure***

*The Government's commitment to ensuring the UK's telecoms networks and services are secure and resilient*

ESOA agrees that the security and resilience of the UK's telecoms networks should be of paramount importance and a strategic priority for the UK Government. DCMS will be aware that the UK's Emergency Services Network (ESN) includes satellite communications provided through a resilient, high throughput satellite network.

In cases of national emergency and disaster, satellite communications provide the only reliable solution for mitigation, recovery and post recovery actions.

**2. Does this document set out clearly the role of Ofcom in contributing to the Government's strategic priorities and desired outcomes?**

ESOA understands that the purpose of this Statement of Strategic Priorities ("SSP") is to provide UK Ofcom the context and guidance about the Government's policy priorities and desired outcomes in relation to telecommunications, the management of radio spectrum and postal services. The role of UK national regulator Ofcom is critical to achieve the UK Government priorities, and we fully support the leadership of European policy makers, including the UK Government, on 5G policy. One fundamental role for Ofcom is to define, conduct and manage the national spectrum policy.

ESOA notes the UK government has identified the following spectrum management ways to meet its strategic priorities (para 37):

- *Meeting and going beyond the European Electronic Communications Code (EECC) requirement to release 1 GHz of spectrum in the 26 GHz band in a timely manner*

<sup>7</sup> See: <https://www.youtube.com/watch?v=30PIO3Keras> and <https://artes.esa.int/satellite-5g> and <http://sat5g-project.eu/>

- *Completing the award of the 700 MHz and 3.6 – 3.8 GHz bands in a timely manner*
- *Assessing the feasibility, costs and benefits of flexible licensing models in the 3.6-4.2 GHz bands*

ESOA's primary concern is to ensure measures taken to release spectrum for 5G in Europe do not prejudice existing frequency users or impact current and future satellite service offerings in the C-band spectrum (between 3.4 and 4.2 GHz). In particular, ESOA wishes to underline that European satellite operators have invested very large sums of money in developing Fixed Satellite Service (FSS) communications platforms and networks in the C-band spectrum, notably in the part that is between 3.8 and 4.2 GHz. Therefore, we are concerned that any hasty decisions to further open this spectrum in order to "free up" even more spectrum for terrestrial mobile applications would undermine the investments made by satellite operators and service providers in this band and have a negative impact on European industry and consumers relying on C-band satellite services.

ESOA's specific views are presented below. The market and policy situation being very different between the 3.6-3.8 GHz and 3.8-4.2 GHz bands, it is very important to look at these separately, in line with Ofcom's approach.

#### The 3.6 – 3.8 GHz band

The whole 3.4-3.8 GHz band is one of the three priority bands for 5G in Europe, and Ofcom has already taken the decision to make the 3.6-3.8 GHz band available to 5G mobile terrestrial systems as of 2020 and fully usable for 5G as of 2022.<sup>8</sup>

ESOA regrets that UK Ofcom has not adopted an approach similar to other European countries in defining the technical conditions for the pursuance of satellite services in this band and their [limited] coexistence with mobile systems in order to protect their international traffic, but rather decided to stop completely the licensing process of satellite services in this band (as of June 2020) and not to ensure any protection measure. This will have a detrimental impact to the UK as many services providers like the BBC or Arqiva would have to either migrate to higher bands or locate their teleports outside the UK.

#### The 3.8 – 4.2 GHz band

UK Ofcom has very recently consulted the industry on its plans to share the 3.8-4.2 GHz band with broadband fixed terrestrial systems, proposing specific sharing modalities. ESOA and several individual satellite operators commented on these plans (we expect the comments to be soon made available on Ofcom's website).

The 3.8-4.2 GHz band is absolutely critical to our sector. The satellite transmission traffic in this band is four times higher than in the 3.4-3.8 GHz band; and the unique services (e.g. intercontinental links and links with high reliability requirements, including governmental / military links or broadcast distribution) relying on the existing satellite teleports are expected to continue operating in the 3.8-4.2 GHz band in the future to provide critical services that cover a cross range of applications.<sup>9</sup> The maritime sector globally is also increasingly using earth stations operating in this band, some of which are connecting while in the UK territorial waters. Furthermore, it is our expectation that a large part

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<sup>8</sup> [https://www.ofcom.org.uk/data/assets/pdf\\_file/0018/110718/3.6GHz-3.8GHz-update-timing-spectrum-availability.pdf](https://www.ofcom.org.uk/data/assets/pdf_file/0018/110718/3.6GHz-3.8GHz-update-timing-spectrum-availability.pdf)

<sup>9</sup> This includes the continuing use of the 3.8-4.2 GHz band for essential telecommand, telemetering and control (TT&C) of **operational UK satellites**.

of the satellite services using the 3.6-3.8 GHz band will have to migrate into the 3.8-4.2 GHz band, resulting in increased demand for satellite spectrum in this band.

ESOA is thus pleased that this band remains open to, and usable by, satellite service providers, consistent with all frequency allocation tables. ESOA is however seriously concerned about how Ofcom has proposed to apply the coordination procedures and protection criteria to new users of the 3.8-4.2 GHz band.

First, ESOA would expect transitional arrangements for the anticipated migration of satellite services currently operating in the 3.6-3.8 GHz band into the 3.8-4.2 GHz band. Second, it is to be reminded that contrary to fixed (terrestrial) services, mobile (terrestrial) services have a secondary status in the 3.8-4.2 GHz band under the UK Frequency Allocation Table, the European Common Allocation (CEPT-ECA) table and the ITU Radio Regulations: this means **any new mobile terrestrial service introduced in the band will have to coordinate with, and ensure protection of, existing and future satellite services**. Third, given the anticipated important increase of usage of the 3.8-4.2 GHz band by various types of systems, ESOA seeks clarity on how Ofcom plans to treat the existing satellite earth station sites in this band after the expiration of their current licenses, and if the renewal of the licenses for these satellite earth stations will be automatically granted.

ESOA would very much appreciate that a statement from UK Ofcom provides reassurance on these three points, as any facilitating of opportunistic spectrum access across the 3.8-4.2 GHz band needs to ensure not to cause undue interference to satellite licensees.

#### The 24.25 – 27.5 GHz band (“26 GHz band”)

As an additional note, ESOA acknowledges that the 26 GHz band, which totalizes more than 2 GHz of spectrum, is a priority band for 5G in CEPT and is the priority band at ITU level for a global identification for 5G terrestrial mobile systems (so-called IMT) under the World Radiocommunications Conference Agenda to take place at the end of 2019 (WRC-19).

There is a need to take into account existing allocations and services of the band, and more specifically the 24.65-25.25 GHz frequency band for Fixed Satellite Services (FSS), by developing appropriate provisions to safeguard in a proportionate way the possibility for future deployment of FSS earth stations. Compatibility between FSS and IMT in this band has been studied in the CEPT, and some conditions adopted.

The 24.65-25.25 GHz band indeed represent 600 MHz of spectrum allocated to satellite services by the ITU in 2012 (at the WRC-12 conference): satellite operators are still developing systems so while there are few earth stations operating in this band today, it is likely that many more will be deployed in the future. Satellite systems have only just started deploying in this band, e.g. two satellites (DIRECTV-14 and DIRECTV-15) were launched with 24.75-25.25 GHz on-board. Also, the EU research project Sa5G has a use case relying on this spectrum to efficiently multicast common content to multiple 5G base stations by satellite.

The authorisation regime for 5G in the 26 GHz band should therefore include explicit terms and conditions that enable the future viable and sustainable use of this band by space and satellite services and to protect the ground and space stations from unacceptable emissions.

Provided these conditions are respected, the available bandwidth is sufficient to implement wideband carriers and achieve targeted data rates to accommodate 5G terrestrial needs. Economies of scale can be achieved globally in using this band worldwide.

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## Other frequency bands

ESOA strongly supports that the whole 66-71 GHz band should be prioritised for mobile 5G usage. ESOA believes that there are compelling arguments why the 66-71 GHz should become a primary band for 5G services in the UK and in Europe, and we note that this band could provide five network operators with up to 1 GHz of exclusive spectrum to deliver 5G services each.

ESOA also recommends extending the 66 -71 GHz band to 71 - 76 GHz by using the existing frequency allocations. Not only could this doubling make it possible to achieve the UK connectivity goals, but opening 10 GHz of spectrum from 66-76 GHz could afford significant future-proofing for that goal.

### **3. Additional comments**

ESOA notes the UK Government wishes to adopt a holistic approach amongst all actors involved in providing 5G solutions (para 44):

*The policy and regulatory framework should be sufficiently flexible and forward-looking to support convergence between fixed and mobile networks, through:*

- *Removing practical obstacles or barriers to the deployment of converged networks. The Government would like network operators and mobile operators, working with local authorities and other relevant parties, to design infrastructure architecture that can meet the requirements of 5G roll-out;*

As a reminder, DCMS and HM Treasury produced a report in March 2017 setting out a strategy for 5G to refine the Government's policy as 5G technology emerges and evolves.<sup>10</sup> Surprisingly, this report which claims ambitions to work closely with industry has not taken into account the important role and views of the satellite industry.

As explained above it is clear that 5G will be a network of networks which will include satellite technology. In a world where radiocommunications are playing an increasingly important role in connecting people, ESOA would like its members to be fully associated into the policy decisions and planning for deployment of 5G both from a national and a local perspectives within the UK. Working on 5G coverage requires strong and consistent collaboration involving Central Government, Local Government, Ofcom, mobile operators, fibre providers, infrastructure operators, and property owners as well as satellite service providers in order to ensure the maximum coverage of 5G services across the UK. It may also need the UK Ministry of Housing's National Planning Policy Framework to reflect the unique characteristics of 5G networks, and for the Local Government Association to encourage the adoption by its members of best practice guidelines.

## **Conclusion**

As a conclusion, ESOA would like to thank DCMS for this opportunity to comment on this consultation. We would be happy to provide any further clarification on the contents of this input and look forward to further engage with you on any point of our submission.

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<sup>10</sup> [www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/597421/07.03.17\\_5G\\_strategy\\_-\\_for\\_publication.pdf](http://www.gov.uk/government/uploads/system/uploads/attachment_data/file/597421/07.03.17_5G_strategy_-_for_publication.pdf)