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GSOA Contribution to Consultation on GSR 24 Best Practice Guidelines
Charting the Course of Transformative Technologies for Positive Impact

Introduction

There has been tremendous progress in the last two decades in bringing the world's population online. However, 2.6 billion people worldwide do not yet have internet access, whether due to access, cost or usability, and 80% of internet of things (IOT) devices are concentrated in only 20% of the world, mostly in urban areas.

With growing demand for digital services in all regions of the world and users' expectations to be connected everywhere at all times, more affordable, efficient, reliable and secure connectivity is needed. For this reason, many countries and regions increasingly rely on satellite connectivity, particularly where there is little or no terrestrial broadband infrastructure.

As transformative technologies also continue to reshape industries and societies, satellite communications play an increasingly critical, transformative role in advancing digitalisation, charting a course towards positive social and economic impact. To bridge the digital divide, satellite networks in different orbital altitudes, working independently or together, can provide connectivity in the most difficult to reach locations, unserved or underserved areas. With recent and anticipated technological advances, communications satellites will continue to be at the forefront of providing affordable access to broadband across the globe especially in developing as well as rural and remote regions.

The rapid advancement of satellite, and antenna technologies enables the provision of greater and enhanced services, more cost-effective launch, as well as the progress in developing standards around non-terrestrial networks within 3GPP to support 5G and beyond. These advancements bring greater capabilities and service options to successfully address the global digital divide and to provide critical services in even the most difficult to reach locations.

New services and business models are quickly evolving. High speed satellite residential broadband is making a meaningful difference around the world, B2B solutions enabled by partnerships between satellite operations and other providers enhance cellular backhaul or community Wi-Fi solutions. Direct to Device and Communications on the move are also examples of the evolution of the services. These changes (1) advance access to high-speed connectivity and accelerate the development of advanced services, and (2) bring connectivity to rural and remote areas, bringing opportunities for socio-economic development and a brighter future for citizens, enterprises and governments.

1. What are the challenges and opportunities faced by policy makers and regulators in embracing transformative technologies for greater impact?

One common challenge to embracing transformative technologies such as today's satellite technologies concerns working to inform and enable regulators and policymakers on the best and most efficient ways technologies can be used to bridge the digital divide in their respective country or region. For instance, in some cases, regulators and policymakers may not have access to trainings that are generally available to industry representatives. Such training would enable government officials

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to remain up to date on the most cutting-edge technologies. With a better understanding of all the potential technological solutions, regulators and policy makers can ensure that their decisions are technology inclusive, which is likely to result in a more effective and less costly solution that best serves the public. By defining a goal rather than a specific limited technical solution, operators can propose the best technology solution to meet the government's objectives and the public interest.
The rapid growth in the space sector provides an excellent opportunity for regulators and policy makers to partner with the industry to develop innovative and customised solutions to their country's unique needs and interests. For example, while regulators have leveraged space services capabilities for various use cases ranging from sustainability to disaster recovery, a more concerted effort among regulators could result in cross-border cooperation on projects of regional or global significance. This also allows for countries without a thriving commercial sector, to participate in and benefit from a wider initiative, including potentially using their local capabilities for regional impact.

Transformative technologies also provide tools for more efficient regulatory processes. Regulators and policy makers can harness transformative technologies to develop efficient reporting mechanisms for existing regulatory obligations and streamline applications and compliance processes. By using advanced technologies, regulators can automate much of their regulatory monitoring, assessment, and enforcement tasks thereby reducing administrative burdens and improving efficiency and, ultimately, compliance. This approach could also facilitate increased interaction and sharing among regulators and would foster a regulatory environment that is more adaptive, responsive, and supportive of innovation, compliance, and responsible business practices.

2. What are the key regulatory measures and guiding principles to follow to foster positive and inclusive impact of transformative technologies?

To foster a positive and inclusive impact of transformative technologies, several key regulatory measures and guiding principles are essential to consider:

1. **Prioritise Connectivity for All:** In a world that is increasingly interconnected, the benefits of access to connectivity are obvious. Conversely, the downside of insufficient or lack of connectivity is equally obvious. Fostering connectivity for all has a tremendous impact on quality of life including the ability of citizens and businesses to use satellite technologies to make calls and send messages; access to online education, healthcare, and entertainment; engage in commercial transactions including beyond the local community; optimise agriculture and the sustainable use of natural resources; meteorological notifications; and emergency warnings and recovery efforts. All these applications assume there is ubiquitous connectivity whether on land, at sea or in the air. For a truly inclusive and successful dissemination and adoption of transformative technologies, it is vital to build the predictable regulatory and policy frameworks required for satellite providers to timely serve the market.
2. **Technology Inclusivity**: Regulatory and policy frameworks should be designed on a technology inclusive basis to ensure that citizens can benefit from meaningful connectivity. This will allow the market to determine which technological solutions are most appropriate for a particular use or to satisfy a particular need.
3. **Integration:** Regulators are encouraged to adopt regulatory and policy frameworks that enable an inclusive approach that allows for the deployment of solutions using technologies that meet the users' requirements. The key to the future of connectivity relies in pooling the strengths of different technologies to increase coverage, cost efficiency, and economies of scale, whilst simultaneously working together to deliver the exceptional resilience and greater

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availability. Fostering cross-industry collaboration will also be key to making technologies' convergence a success.

4. **Regulatory Certainty**: Regulatory and policy makers' decisions need to be informed by a future looking strategy and create a regulatory and policy environment that is agile enough to respond to market evolution, and will drive growth, innovation and investment. Regulatory certainty and predictability are critical to ensuring that industry continues to make the necessary investments that drive the technological developments needed to meet the evolving needs of consumers, businesses and governments. While regulations and policies will, of course, periodically need to be updated as technology evolves, the regulatory structure should include flexibility in regulations and laws to facilitate and expedite the necessary changes avoiding any unnecessary delays in service delivery.
5. **Remove Regulatory Barriers:** Regulators should assess requirements that prevent companies from deploying services and consider removing barriers. For example, allowing class or "blanket" licensing of Earth stations with reasonable fees for satellite providers would expedite the licensing process while removing unnecessary licensing burdens placed on the regulator. A general authorisation approach will enable a maximum number of installations and the maximum benefit from connectivity in any country. Another example would be the elimination of the requirement to establish a local entity or branch or partnership in order to obtain market access. These requirements can dissuade operators from serving a market because they raise service and operating costs, significantly delay market access and are unnecessary for the provision of service. A final example is the imposition of excessive regulatory fees. Such fees have a knock-on effect on service costs and, when high, can dissuade operators from offering services in a particular market or encourage them to leave as the cost of doing business becomes overly burdensome.
6. **Promoting Global Standards**: Promoting the development of global standards and policies is crucial. This approach fosters innovation, encourages investment, and enables industry to leverage economies of scale. Ultimately, promoting global standards will save on development costs and encourage the more rapid development of new technologies, products and services directly benefitting industry and all of its users.
7. **Ensuring Long Term Access to Spectrum**: Spectrum availability and access is essential for the provision of existing and future services and anticipated growth of the space sector. It is important to ensure a balance between rapid innovation and regulatory frameworks that guarantee access to essential spectrum for all communications services providers, including satellite operators, in a way that is certain, non-discriminatory and provides an efficient policy environment.
8. **State Aid:** Ensure that any digital public subsidies, State Aid and social programmes are open to all types of technologies and networks capable of meeting critical features and consumer requirements on a technology inclusive basis.
9. **Encouraging Innovation:** Regulators and policy makers should embrace flexible and adaptive regulatory approaches, such as local and cross-border regulatory sandboxes (i.e., real-world, small-scale testing of satellite industry innovations) or pilot programs, which will allow companies to experiment with new innovations while also allowing regulators to observe the impact and develop new rules while minimizing potential negative impacts on innovation.

By incorporating these regulatory measures and guiding principles into policy frameworks, regulators can create an environment that fosters positive and inclusive impacts of transformative technologies in the telecommunications and space sectors.

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3. How to drive positive behaviours of market players? How to minimize risks while maximizing benefits?

To drive positive behaviour of market players, it is essential to create a stable regulatory and policy environment that promotes competition, investment and collaboration while simultaneously ensuring that the public interest is served.

Key to fostering opportunities, is a predictable regulatory and spectrum environment. A policy environment that promotes partnerships and other commercial arrangements between satellite operators, mobile network operators, and in some cases, with the public sector (e.g., through public private partnerships), to create sustainable business models and solutions that are tailored to local needs and will help achieve the desired connectivity, social and economic goals.

Satellite technology plays a crucial role in advancing the United Nations Sustainable Development Goals (SDGs) and is a powerful tool that contributes to the achievement of multiple SDGs by providing valuable data and enabling communication and connectivity in even the most remote and underserved areas. It plays a vital role in monitoring progress, improving decision-making, and facilitating sustainable development efforts worldwide.

Finally, space provides significant benefits to people and our planet and preserving those benefits in the face of greater utilization of orbits for valuable services requires timely action. GSOA Code of Conduct on Space Sustainability endorses industry practices that will enable the world to maximise the use of access to, and benefits from, space resources.

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