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Financing space: Procurement, competition and regulatory approach (2)

Author: Mr. Yvon Henri  
Oneweb, United Kingdom

Ms. Ruth Pritchard-Kelly  
Oneweb, United Kingdom

TO FULLY BRIDGE THE DIGITAL DIVIDE BY 2027, MAKING INTERNET ACCESS AVAILABLE  
AND AFFORDABLE FOR EVERYONE- THE NON-GSO CONSTELLATION RESPONSE

**Abstract**

We all need access, but half the world has no way to connect. Satellites make it possible, in particular constellations of non-geostationary satellites (900 to 2000 satellites around 200 kg in mass operating in the fixed-satellite service), called also “mega-constellations”, that will circle the Earth at about 1200 km altitude to enable affordable access, low latency and broadband capacity for better web performance. Small, low-cost user terminals will talk to the satellites in the sky, and emit LTE, 3G and WiFi to the surrounding areas, providing high-speed access for everyone. As a global issue and the main challenge of our times, this paper presents the main regulatory, legal and policy issues at stake to achieve this goal. Space is a shared, natural resource that must be protected like any other, and accessing and sharing frequency spectrum, preventing debris creation, respecting existing space assets, and ensuring a safe and sustainable space (and Earth!) environment for the future is a must! The satellite orbit and spectrum resource used by satellite mega-constellations is particularly sensitive, because it operates in frequency bands shared also with the large satellite networks located along the crowded geostationary satellite orbit. Several satellite mega-constellations are planned to be launched and operated globally in the near future and the challenges would be to ensure a fair sharing of the orbit and spectrum resource between themselves whilst guaranteeing the protection of existing geostationary satellite networks. A complex technical and regulatory approach called Equivalent power-flux density (EPFD) has been adopted in the ITU Radio Regulations for the protection of GSO networks which considers the aggregate of emissions from all non-geostationary satellites in the direction of any geostationary earth station. Also, regulatory and technical improvements of the Regulations (e.g. bringing into use of satellite constellations, etc), to better take account of non-GSO systems will be among the most discussed items at the next World Radiocommunication Conference 2019 (WRC-19). This paper will also address the issue of satellite end of life disposal, the automatic de-orbiting of a satellite near the end of its intended service life, ensuring that the space around our planet remains free and clear for future generations.