

Ensuring Frequency Spectrum and Orbit Resources Sustainability in the New Space Era

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Introduction and Current Challenges

RRB's role: Ensuring equitable access and rational use of radio spectrum and satellite orbits

Challenges:

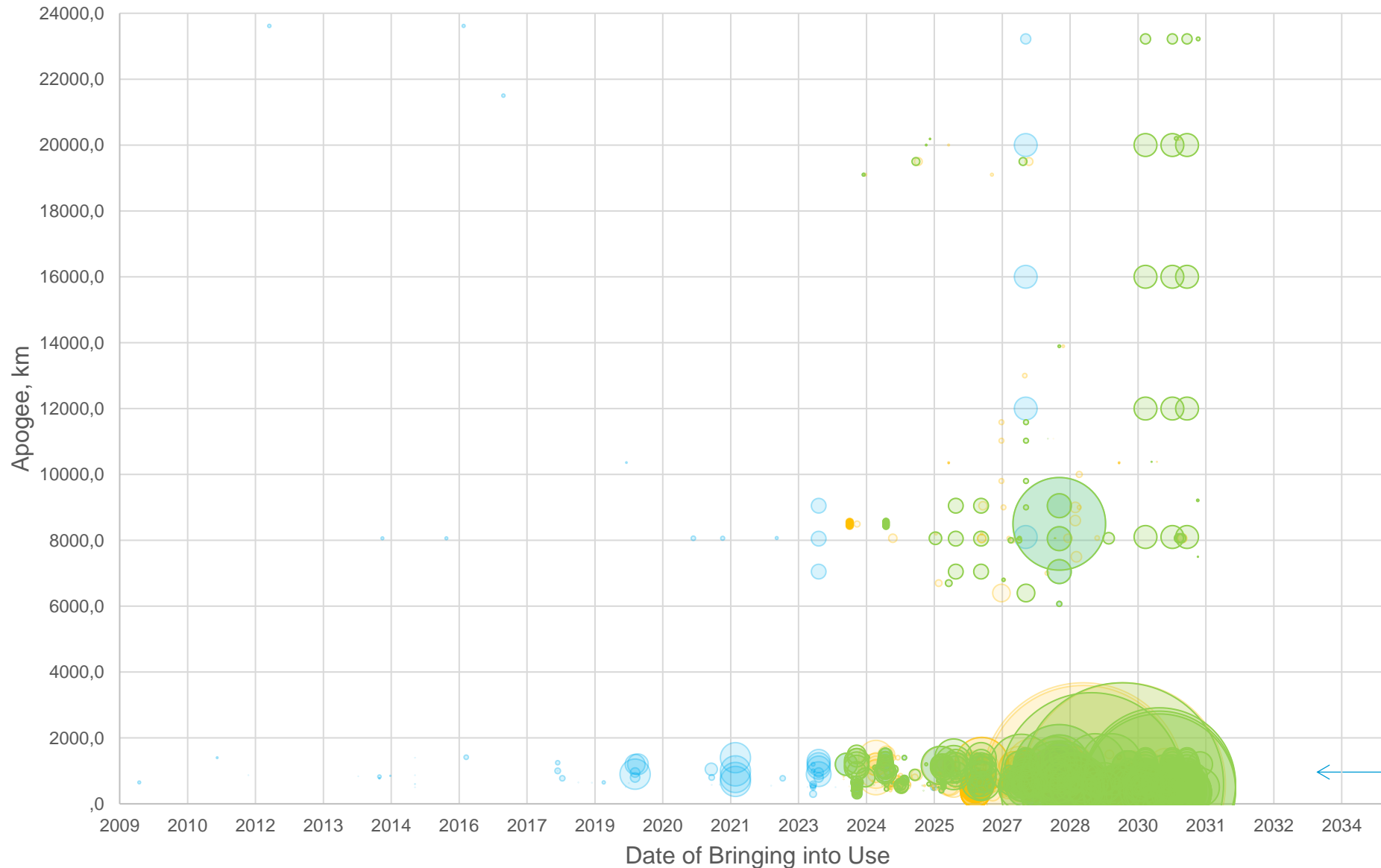
- Exponential growth in satellite networks and systems
- associated growth in orbital debris risk
- Increasing use of non-geostationary orbits (NGSO), with explosive growth of extra large NGSO systems not subject to ART9 coordination
- Rush to large constellations as a combination of 'first come, first served' principle and competition to be first to market for broadband and now direct to device services
- Complexity in coordination and bringing into use (BIU) procedures of NGSO systems
- Risk of harmful interference between systems
- Potential for spectrum warehousing and inefficient use



| Key Findings from RRB Report to WRC-23...still topical!

- Proliferation of large LEO constellations - Concerns for orbital sustainability, and spectrum congestion. Challenges for new entrants
- Challenges to ITU regulatory framework - Criticism of ITU's absence of true response to large constellations. Some countries considering rules outside ITU
- Increased risk of satellite interference - Complex scenarios with many satellites/planes.
- Misuse of regulatory provisions (No. **4.4**) - Bypass normal procedures. Growing use for commercial services
- Long-term space sustainability - Need for additional deployment information and precise sharing strategies for large systems. Concerns about space debris mitigation and fleet maintenance.

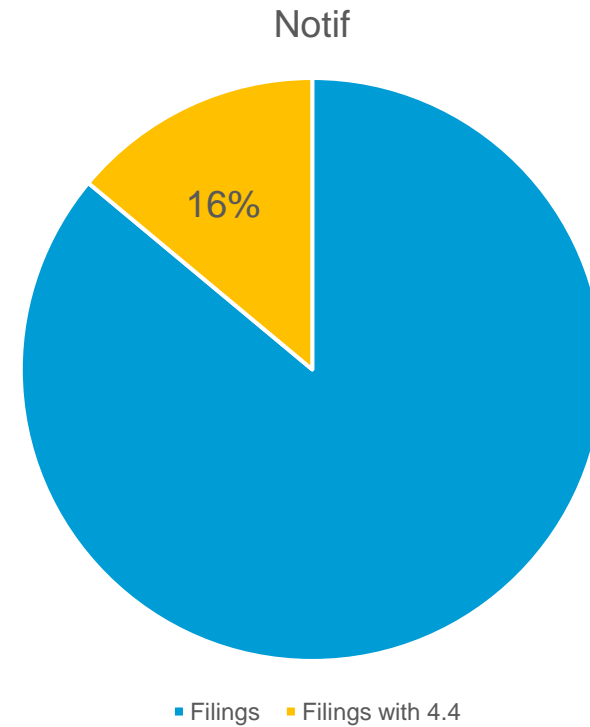
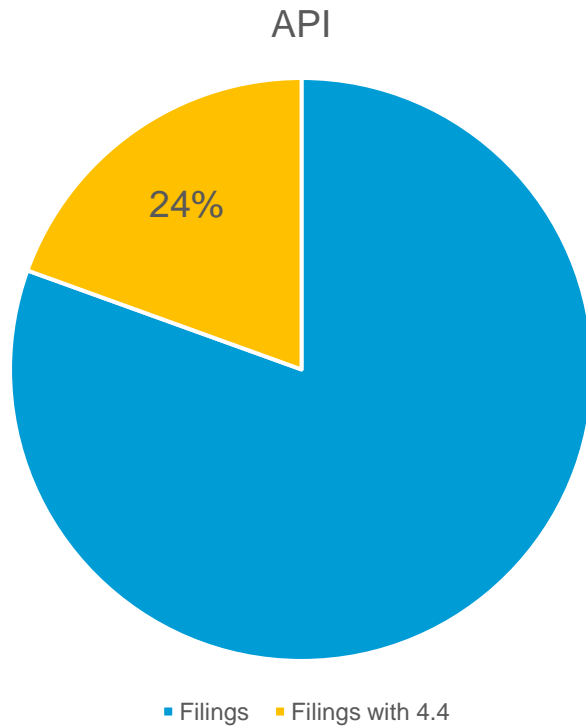
Size of the NGSO constellation (FSS/MSS)



- Advanced Publication
- Notification
- Coordination

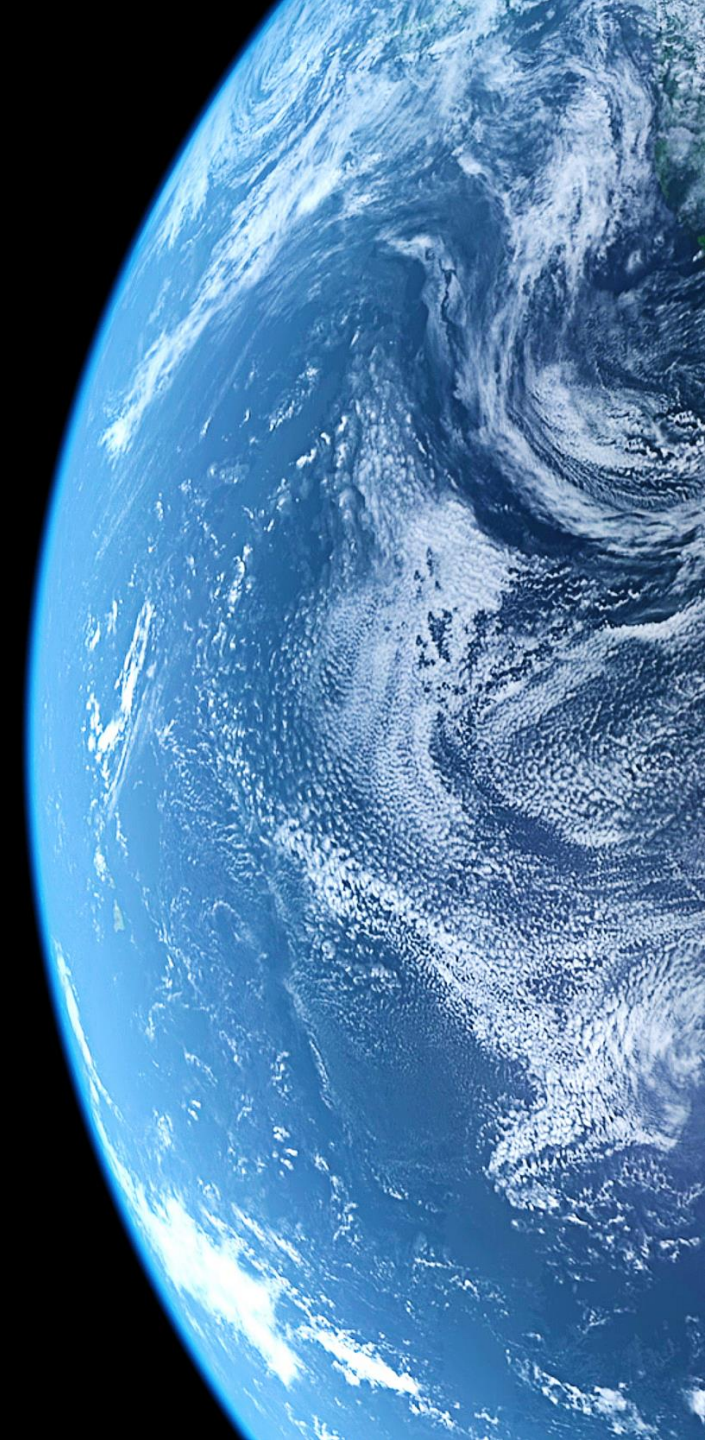
← Concentration of non-GSO systems below 2000km

Percentage of filings containing No. 4.4 assignments



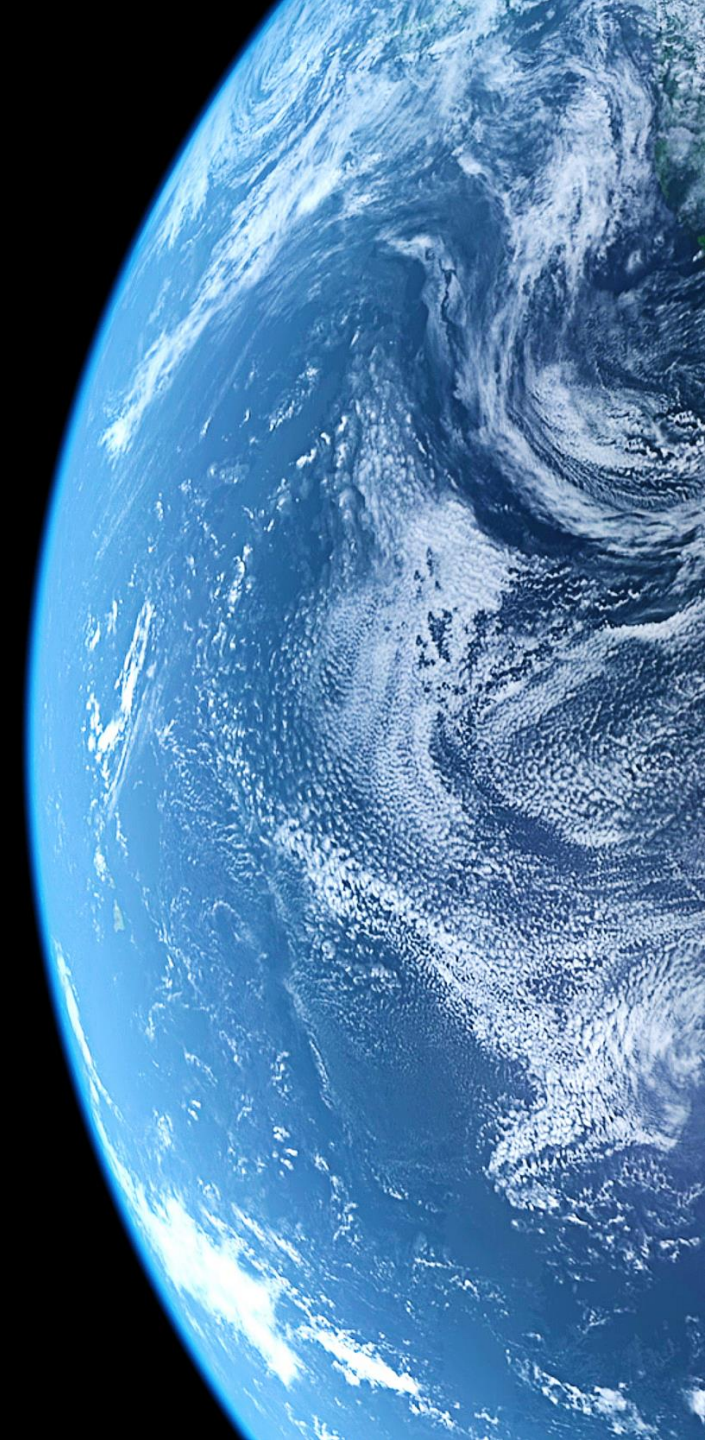
Solutions for Long-Term Sustainability (1/2)

- Regulatory Compliance - Ensure genuine use of frequency assignments. Address misuse of provision No. 4.4 – strict application of the RoP No.4.4
- Technical Measures - Require detailed deployment and operational information or milestones for ALL NGSO systems e.g., rationale for the requested number of satellites and planes, planned launch schedule...
- Sustainable Use - Balance innovation with sustainable use of resources. Plan fleet maintenance, timely deorbiting strategies and mitigation of space debris...
- *... to be added to AP4 requirements, new/reviewed Res. 35, ... at WRC-27*



Solutions for Long-Term Sustainability (2/2)

- Consideration of a “sustainability finding” for NGSO filings (WP4A to develop a Rec and a future WRC to incorporate this into AP4 or through a Resolution)
- International Cooperation - Strengthen cooperation for interference resolution. Improve international monitoring systems
- Equitable Access - Conduct ITU-R studies on fair access to orbits and frequencies
- Study of operational, technical and frequency requirements to provide In-Orbit Services (IOS) (space inspection, life extension, maintenance, repair, relocation, refuelling), End-of-Life (EOL) and active debris removal (ADR) services to GSO and non-GSO satellite
- ... *at WRC-27!*



Merci!

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