



Radiocommunication Advisory Group

30 March – 2 April 2026



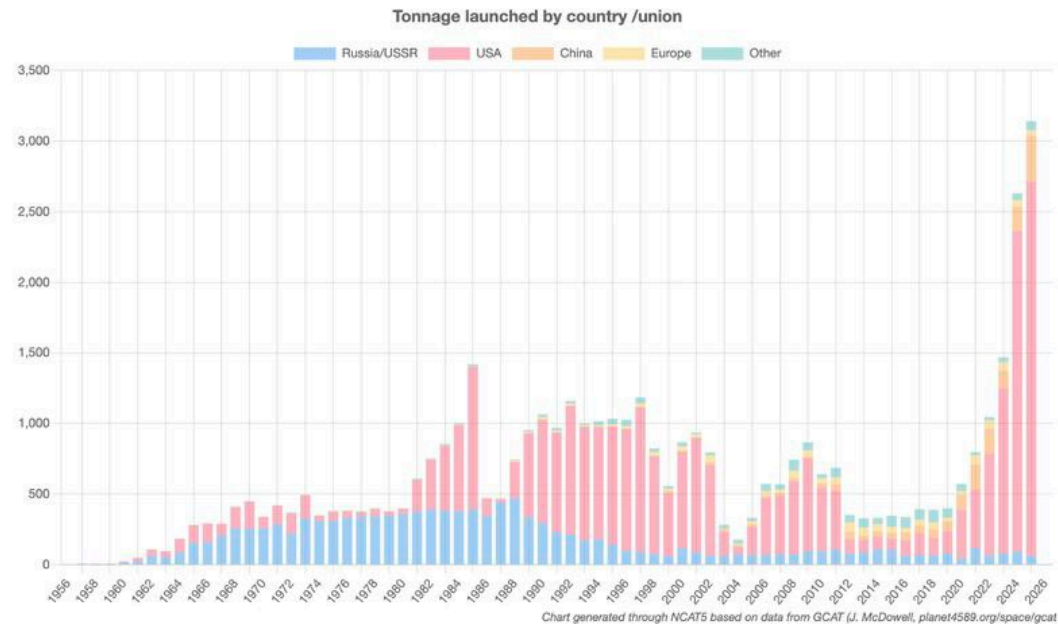
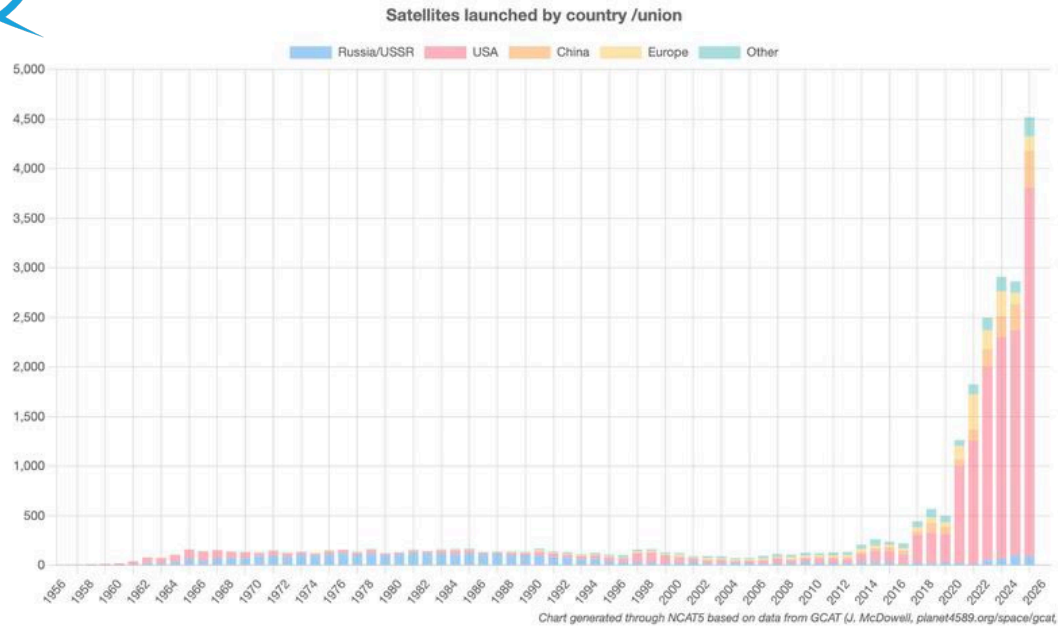
Study Group 4 ITU-R "Satellite Services"

Dr. Victor Strelets
Chairman of ITU-R SG4





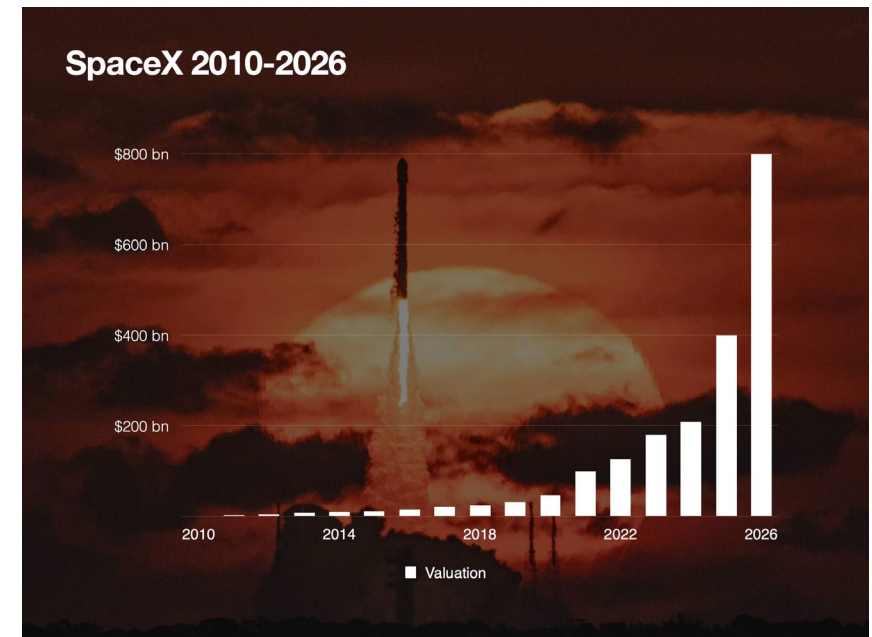
Number of satellites launched in space in 2025 and total payload weight



The year 2025 set a new record for space activity, both in terms of the number of satellites launched and the total mass sent into orbit.

In 2025, the U.S. launched an unprecedented number of satellites — more than 3,700 in total — putting more than 2,600 tons of mass into orbit. In doing so, SpaceX played a central role

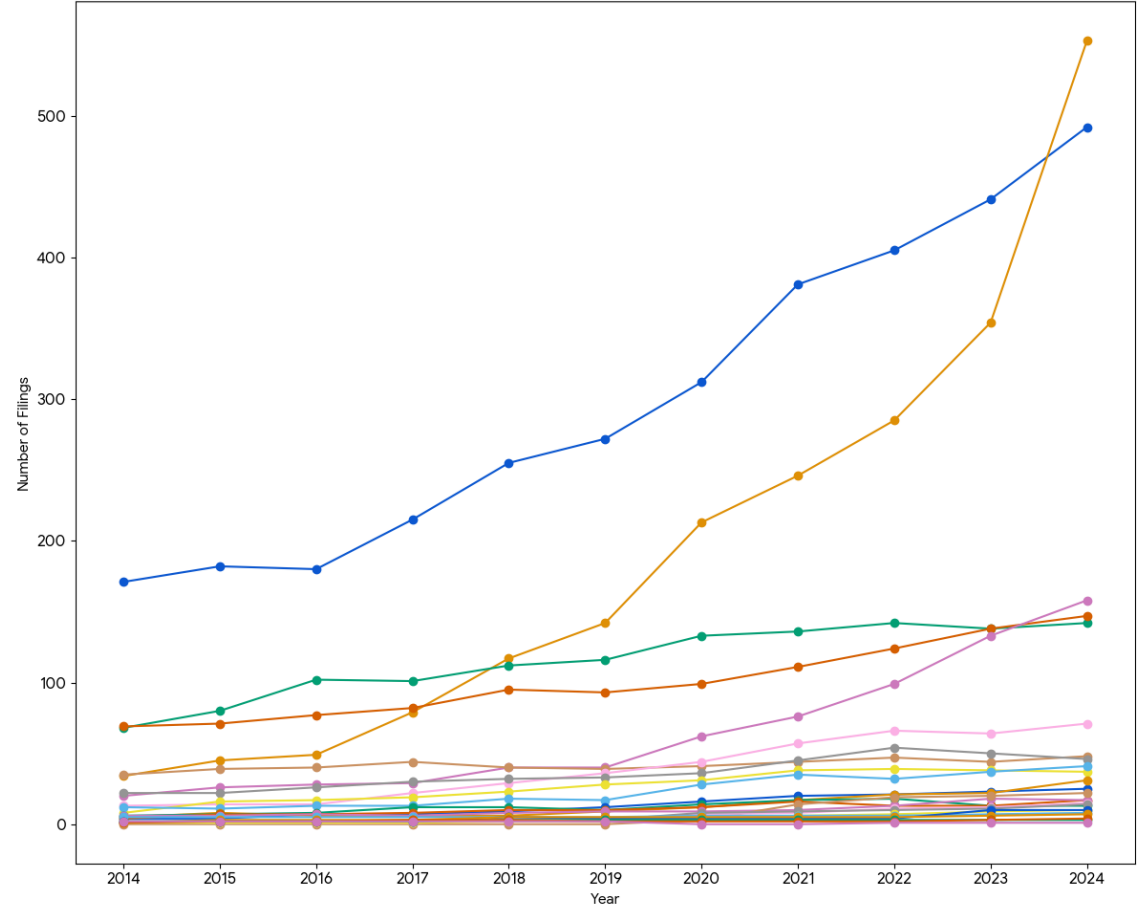
China set a national record by launching 371 satellites in 2025 — roughly 10% of the total number of American satellites — and sending 325 tons of mass into orbit.





Filing with ITU for non-GSO frequency assignments by different countries (2014-2024)

NGSO Filings Trend by Country (2014-2024)



- Country
- USA
- China
- France (include F/ESA, F/GLS)
- Japan
- Germany (include D/GLS)
- Russia (include RUS/IK)
- United Kingdom
- Canada
- Norway
- Spain
- United Arab Emirates
- Luxembourg
- Netherlands
- Brazil
- Argentina
- Rwanda
- Australia
- Thailand
- Papua New Guinea
- Saudi Arabia
- Egypt
- Indonesia
- South Africa
- Malaysia
- Nigeria

N	Administration	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
1	USA	171	182	180	215	255	272	312	381	405	441	492
2	China	34	45	49	79	117	142	213	246	285	354	553
3	France (include F/ESA, F/GLS)	68	80	102	101	112	116	133	136	142	138	142
4	Japan	69	71	77	82	95	93	99	111	124	138	147
5	Germany (include D/GLS)	20	26	28	29	40	40	62	76	99	133	158
6	Russia (include RUS/IK)	35	39	40	44	40	39	41	44	47	44	48
7	United Kingdom	13	14	14	22	29	36	44	57	66	64	71
8	Canada	22	22	26	30	32	33	36	45	54	50	46
9	Norway	8	16	17	19	23	28	31	38	39	38	37
10	Spain	12	11	13	13	18	17	28	35	32	37	41
11	United Arab Emirates	4	4	7	7	9	12	16	20	21	23	25
12	Luxembourg	5	8	6	6	6	9	12	17	21	22	31
13	Netherlands	6	7	8	12	12	10	14	17	18	13	13

Increasing competition for Internet access using non-GSO systems has raised concerns among developing countries about their future need for access to radio spectrum and satellite orbits – limited natural resources that are critical to the operation of all satellite systems.



Main trends in the space industry

A multiple increase in the number of launches into space, resulting in an increase in satellites in orbit

Deployment in space of megaconstellations of non-GSO satellite systems

Demand for satellite capacity is increasing

Government investment in space around the world has increased sharply over the past five years, at a compound annual growth rate (CAGR) of about 10%.

Mergers and acquisitions of the largest satellite operators and companies

Space is no longer considered as a separate industry and is becoming the infrastructural basis for other sectors of the economy and state priorities.



The emergence of high throughput satellites (HTS) in GSO and non-GSO

Direct-to-Device

Strategy of satellite operators for multi-orbitality when providing services

Laser Communications and the Rise of Orbital Data Centers



Number of satellites launched in space in 2025 and total payload weight

The space industry is entering a period of rapid and irreversible change. The growth of megaconstellations of communications satellites, ideas for orbital data centers, and new types of payloads are radically increasing the scale of activity in orbit. Now applications for constellations of tens and hundreds of thousands of satellites, and sometimes even more than a million, are becoming commonplace. Even if only part of these plans are implemented, the consequences will be felt by the entire industry.

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Competition in the non-GSO segment is intensifying: in addition to SpaceX's Starlink, OneWeb is preparing its own constellations of Amazon, Telesat and other players focused on government and corporate markets.

Defense agencies are increasingly turning to commercial companies to accelerate the development of new technologies and deploy modern systems faster.

Space is gradually turning from a symbol of prestige into an industrial platform.



Problems of Regulation of the Radio Spectrum and Satellite Orbits



The satellite industry is growing at a record pace, and the existing international and national regulatory framework for the use of Radio Frequency Spectrum and satellite orbits by space systems has not kept pace



The frequency of updating the ITU Radio Regulations, which contain rules and regulations for the use of RFS and satellite orbits, is approximately 4 years (the period between WRC). The next conference will be held in 2027. The agenda of WRC-27 was adopted in 2023.

Despite the fact that Cosmos itself is a harsh environment, it is predictable. The "danger" that analysts point to today is the unpredictability of corporations controlling global resources without a comprehensive international regulatory framework.



Issues on which there is extensive study on D2D at ITU



Regulatory/legal matters		
No	Items	Responsibility
1	Status of allocation (primary/secondary)	4C- CPM
2	Procedures for frequency assignments (*1)	4C- CPM
3	Responsibilities and Roles of SNO/MNO	4C-Concept/ 4C-CPM
4	Cross border interference/ operation	4C-Concept/ 4C-CPM
5	Protection of terrestrial IMT	5D
6	Secrecy of the telecommunication/ICT involved (Article 17 of the Radio Regulations)	4C-Concept/ 4C-CPM

(*1) The regulatory procedures required for frequency assignments in DC-MSS-IMT systems should be discussed and options developed.

Technical matters		
No	Itemns	Responsibility
1	Sharing and compatibility studies	4C-Sharing
2	Protection of terrestrial IMT	5D
3	Various technical issues	4C-Sharing

Examples of commercial operation of non-GSO satellite systems with D2D service



The Starlink Mobile (formerly Direct-to-Cell) service, which now operates in the United States, Canada and a number of other countries, using the frequencies of mobile operators and more than 650 satellites. For now, the possibilities are limited: text messages, voice communication and separate applications on some devices are supported. The goal of the project is to bring 5G speeds to mobile devices anywhere in the world. It is claimed that the technology will work in homes, offices and shops. The resulting network already supports 16 million unique users and 10 million monthly active users. **More than 32 countries have joined Starlink Mobile, covering about 1.7 billion people**

Amazon LEO plans to begin commercial provision of services in the United States, Canada, the United Kingdom, Germany, and France by the **end of the first quarter of 2026**.



AST has been able to supply gateways to nine different customers on five continents, providing insight into its initial commercial markets in the United States, Canada, Europe, Japan, the Middle East and Africa. To date, **AST SpaceMobile has partnered with more than 50 mobile operators around the world.**



Battle for the survival of GSO network operators

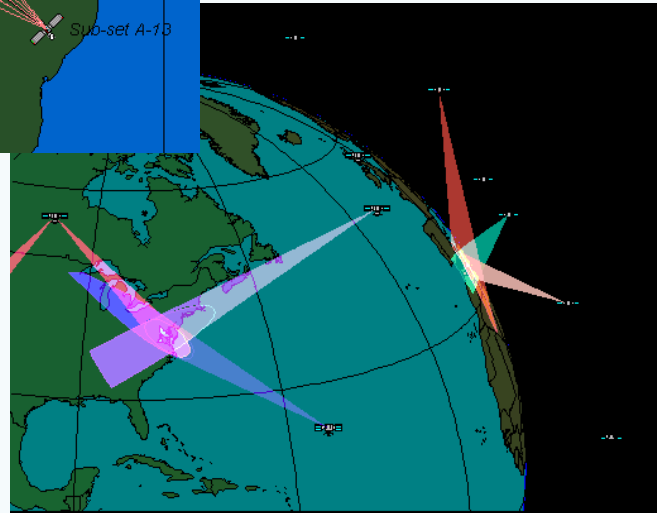
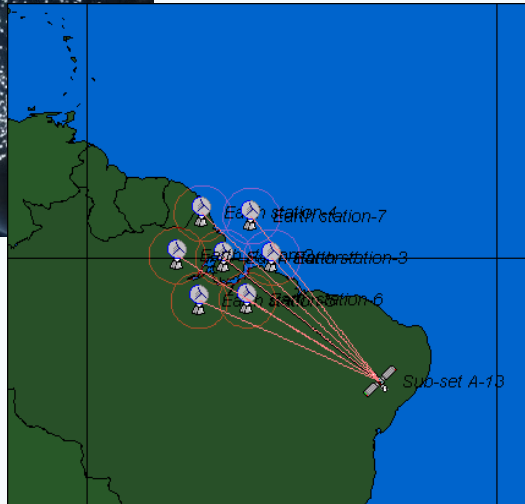
In a filing submitted the week of March 16, 2026, SpaceX argued that the current framework “shackles next-generation satellite operations” and protects “outdated GSO systems” at the expense of millions of broadband consumers.

Conversely, Viasat characterized SpaceX’s push for higher power levels as “bad science,” warning that relaxing these protections would generate unacceptable interference and further entrench SpaceX’s dominant market position.

The internal struggle in the FCC is a precursor to the fight at WRC-27 in Shanghai.

While the EPFD issue is not currently a formal agenda item for WRC-27, industry experts believe a “focused U.S. effort” could force the issue onto the international stage

On January 9, 2026, the FCC granted SpaceX a “time-limited waiver” to exceed these limits for its Starlink Gen2 constellation within the United States. While this was a major victory for SpaceX, the waiver is contingent on the outcome of a formal FCC rulemaking process initiated in April 2025. Incumbents like SES have proposed a “periodic implementation process” as a compromise, which would involve regular check-ins and data-driven adjustments rather than a complete dismantling of the EPFD rules.





A dilemma for administrations. Will operators wait for WRC-31 decisions?

WRC-23 developed the following text in the minutes of the eleventh Plenary meeting:

*“WRC-23 invites ITU-R to conduct technical studies on the epfd limits in Article 22, including the epfd limits referred to in No. 22.5K, in order to ensure the continued protection of GSO FSS and BSS networks, and to **inform WRC-27 of the results of the studies, without any regulatory consequences.** This work should not be submitted under agenda item 9.1.”*

On January 9, 2026, the US Federal Communications Commission issued SpaceX **permission to exceed these limits for Starlink Gen2 in the United States.** Until permanent standards are adopted, non-compliance is the only legal basis for Gen2 to operate over limits.

In 2025, SpaceX took a huge step in the development of Starlink satellite internet, entering more than 35 new markets. SpaceX covers **155 countries and is accessible to 3.2 billion people**, including the most remote regions of the planet. To do this, more than 120 Falcon 9 launches were performed, which added 270 Tbps of bandwidth and allowed the download speed to increase to 200 Mbps, and the network latency is about 26 ms.

What should administrations do when requesting global satellite NGSO operators to exceed EPFD limits in their national territories before a WRC decision is taken? Wait for WRC-31 decisions?



Recommendations of the SG 4 Steering Committee

No	Subject	Recommendation	Actions
1	Meeting Agenda	Prepare and agree on a common meeting agenda template	The Counsellor will prepare a template jointly with the chairs of WP or SG
2	Setting a deadline for completing the discussion of input documents	It is proposed to set a deadline no later than the beginning of the second half of the meeting. For WPs 4A and 4C it is the end of the first week, and for WP 4B it is the end of the third day of the meeting.	The Chairs of WPs, SWG, DG, etc. organize the work of subgroups in accordance with the requirements for the time of submission of documents.
3	Setting time limits for the introduction of input documents.	It is proposed to limit speeches in the presentation of input documents to 5 minutes. This limit is not rigid and depends on the complexity of the material presented.	Use of a timer on the screen controlled by the Chair.
4	Time limit for speakers responding to the introduction of input documents.	No more than 2-3 minutes for the first intervention and no more than 1-2 minute for subsequent interventions.	Use of a timer on the screen controlled by the Chair. The Chair of the group should make a clear decision on how to proceed with the document.
5	Working hours and work on weekends	Need to utilise period zero and evening slots by the decision of the Chairs of the groups, taking into account the progress in the introduction and consideration of input documents. The use of some afternoon slots on weekends is allowed only for the groups for which the introduction of input documents has not been completed.	Decision of the Chairs with the consent of the meeting participants.
6	Parallel sessions	Up to 3 meetings may occur simultaneously, provided that the topics of the two meetings are related to WRC agenda items, and the third topic relates to other current activities.	The WG Chairs agree at the WP Plenary to hold parallel meetings and their topics.
7	Improving the efficiency of ongoing WP activities not related to WRC agenda items.	It is recommended to upgrade the status of consideration of Recommendations, Reports, and other materials at each meeting. In the absence of any progress during the year, it is proposed to withdraw the materials from consideration.	The SG Chair, together with the WG Chairs, shall submit to the SG meeting for approval a work plan indicating the deadlines for the completion of work on each issue and the expected intermediate results of the work.



Sustainability of the radio-frequency spectrum and associated satellite-orbit resources

Resolution 219 (PP-22, Bucharest)

«Sustainability of the radio-frequency spectrum and associated satellite-orbit resources used by space services»

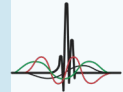


ITUPP
БУХАРЕСТ2022

26 септември - 14 октомври 2022 года
Букарест, Румыния

ITU-R Resolution 74 (RA-23, Dubai)

«Activities related to the sustainable use of radio-frequency spectrum and associated satellite-orbit resources used by space services»



ITURA
DUBAI2023

13 - 17 November 2023
Dubai, United Arab Emirates

The **first action regards technical studies** on the issue of the increasing use of radiofrequency spectrum and associated orbit resources in non-GSO orbits and the long-term sustainability of these resources, with a focus on the prevention of harmful interference.

The **second is to develop a Handbook on best practices for the sustainable use of frequencies and associated non-GSO orbits by space radiocommunication services.** This Handbook will contain individual experiences and guidelines adopted by Member States and Sector Members. ITU-R Study Groups have already started to develop the Handbook.

The **third action is the development of a new Recommendation** providing guidance on safe and efficient deorbit and/or disposal strategies and methodologies for non-GSO space stations involved in radiocommunication services after the end of their life.

Resolution 4-9 (RA-23, Dubai)

«Study Groups 4, 5 and 7 are invited to cooperate on matters related to the sustainability of the radio-frequency spectrum and associated satellite-orbit resources used by space services (see Resolution 219 (Bucharest, 2022) of the Plenipotentiary Conference) and that are under the responsibility and mandate of ITU-R, as appropriate, with Study Group 4 taking the lead on this matter»

Unfortunately, the activities of the General Secretariat in organizing and holding the ITU Space Sustainability Forum 2025 and Space Connect 2025/2026 are not coordinated with the ITU-R SG4. These issues fall within the scope of ITU-R SG4. . This leads to duplication of work and irrational expenditure of funds.



**Thank you for your
attention !**

Dr. Victor Strelets
Chairman of ITU-R SG4
Scientific Consultant

