



# ANC Consultation on Spectrum Fees for Satellite Services

## 1. Introduction

Following the recent amendment of Decree-Law No.15/2012 through Decree-Law No. 31/2024, published in the Jornal da República on 6 September 2024, this paper seeks to consult stakeholders on the establishment of spectrum fees for satellite services. The amendment introduced new spectrum license types, namely individual, network, and general licenses. The law specifies that satellite services will default to the general license type unless the service provider opts otherwise.

In accordance with Article 63 of Decree-Law No.31/2024, this consultation process aims to define the spectrum fees applicable to the general license for satellite services, ensuring that fees reflect economic value while promoting the efficient use of radio frequency spectrum.

## 2. Objectives of the Consultation

The objective of this consultation is to:

- Define a fair, transparent, and sustainable spectrum fee structure for satellite services under the general license type.
- Promote the efficient use of the radio frequency spectrum.
- Support the growth of satellite services in the national telecommunications landscape.

## 3. Background on Licensing for Satellite Services

The amendments introduced by Decree-Law No.31/2024 established three distinct license types for spectrum use:

- **Individual License:** For a single piece of radio equipment at a specific location.
- **Network License:** For a set of interconnected radio equipment operated by a telecommunications service provider.
- **General License:** Covers terminal equipment provided by a telecommunications provider to end users, allowing usage across the entire national territory.

Prior to these amendments, Satellite and Very Small Aperture Terminal (VSAT) services were licensed individually on a per-terminal basis. Each VSAT terminal was subject to a spectrum fee of \$750 per terminal for 24 months (\$31.25 per terminal per month).

With the introduction of the amendments, satellite services are now by default categorized under the general license type, unless an alternative license type is specifically requested by the service provider. The shift towards general licensing allows for broader geographical coverage and the potential for blanket licensing, simplifying administration and reducing costs for operators deploying large-scale satellite services, such as LEO constellations. This consultation focuses on defining the



spectrum fees applicable to the general license for user terminals of satellite services, considering these unique operational characteristics.

#### 4. International Practices

Global trends in spectrum pricing frameworks increasingly emphasize technology-neutral and future-proof approaches that balance economic value with the efficient use of radio frequency spectrum. These frameworks are generally designed to provide regulatory stability, encourage investment, and meet the growing demand for modern telecommunications services.

The rise of low-earth orbit (LEO) satellite constellations is transforming the landscape of satellite connectivity. Unlike traditional satellite systems, which typically serve a limited number of user terminals, non-geostationary LEO constellations may include several thousand satellites and can support a far greater number of terminals, making them a highly scalable solution. This scalability, coupled with the ability to provide high-speed, low-latency connectivity over a larger coverage area—including remote and underserved regions—positions LEO constellations as a crucial component of modern telecommunications infrastructure.

Given this scalability, these new satellite services may complement mobile services as they now have the capacity to serve large numbers of users. This development calls for new regulatory approaches: (1) applying a general license to the user terminals of registered service providers for satellite services, which offers a streamlined approach and reduces administrative burdens for large-scale deployments; and (2) considering the alignment of spectrum pricing frameworks for mobile and satellite services.

In terms of spectrum characteristics, LEO systems require more bandwidth than traditional satellite systems and typically operate in higher frequency bands, such as Ku and Ka bands, which currently experience lower demand.

The potential for satellite services to complement mobile services in serving vast numbers of users in underserved areas suggests a need to align spectrum pricing frameworks for both mobile and satellite services. Considering the spectrum characteristics of LEO systems, the spectrum pricing model for new satellite services should include the following elements:

- **Price Stability:** Maintaining stable prices over a set period allows operators to plan their investments and manage operational costs with greater certainty.
- **Low-Demand Band Incentive:** Charging lower fees for uncongested or low-demand spectrum bands to encourage efficient usage and incentivize operators to utilize less crowded frequencies, promoting balanced spectrum usage.
- **User Factor:** Given the increasing potential of satellite services to complement mobile services, especially in underserved areas, there is a need to align spectrum pricing strategies for these two sectors to combine their capacities for efficiently serving large numbers of users across the national territory.

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## 5. Key Proposals for Spectrum Fee Calculation

The ANC's system of spectrum license fees consists of three components:

- **Application Fee:** A one-time fee to cover the cost of the ANC processing new license applications.
- **Registration Fee:** A fee to cover the cost of issuing the license, entering it into the database, and renewing it each year.
- **Annual Spectrum Fee:** A fee for the continued use of the spectrum resource.

These fees are explained in more detail below.

### A. Application Fee

1. The application fee is a one-time payment made when applying for a new license, regardless of whether the license is ultimately granted. No application fee is payable upon license renewal.
2. This fee covers the cost of the ANC processing and considering a request for a new license. Application fees vary based on the type of service using the spectrum, reflecting the amount of work required by the ANC to assess different types of applications.
3. Application fees are payable at the rates specified in Annex 1.

### B. Registration Fee

1. If an application for a new license is approved by the ANC, the license will be issued upon payment of a registration fee. The registration fee covers the cost of issuing the license and entering it into the ANC database.
2. A registration fee is also payable upon license renewal.
3. Registration fees are payable at the rates specified in Annex 2.

### C. Annual Spectrum Fee

The formula for calculating the annual spectrum fee for the new satellite services is as follows:

$$\text{Annual Spectrum Fee} = k \times Lf \times Bf \times A \times U$$

Where:

- **k** is a constant across all services covered by the formula.
- **Lf** is a factor representing the bandwidth (channel size) of the license, drawn from Table 1.
- **Bf** is a band factor, drawn from Table 2.
- **A** is a factor for each service type, based on the relative value and coverage area of the service (Table 3).
- **U** is the user base discount factor.

Tables 1, 2, 3, and 4 below provide the bandwidth range factors, band factors, service types, and user base discount factors to be used in the formula.

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### Bandwidth range factor

Bandwidth range	Factor
Below 12.5 kHz	0.5
12.5 kHz to below 25 kHz	1.0
25 kHz to below 50 kHz	2.0
50 kHz to below 1 MHz	4.0
1 MHz to below 7 MHz	10
7 MHz to below 14 MHz	30
14 MHz to below 28 MHz	45
28 MHz and above	75

Table 1: Bandwidth range factor (Lf)

### Band factor

Band	Factor
Below 30 MHz	1.0
30 MHz to below 1 GHz	0.75
1 GHz to below 2 GHz	0.6
2 GHz to below 5 GHz	0.15
5 GHz and above	0.1

Table 2: Band factor (Bf)

Note: where a service uses spectrum in more than one of the above bands, the Bf for the lower number should be chosen.

### Service factor

Service	Factor
Earth Station (User Terminal)	0.15
Earth Station (Gateway)	1.75

Table 3: Service factor (A)

In the table above, the service factor for the user terminals for satellite services is 1.0.

### User factor

Number of User Terminals	Factor
Below 500	1.0
500 to below 5,000	0.5
5,000 to below 50,000	0.25

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50,000 to above	0.1
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Table 4: User factor (U)

Satellite operators deploying more than 500 terminals will receive discounted rates, with the discount increasing as more terminals are deployed (e.g., a user factor of 0.1 for 50,000 terminals or more).

Using this formula, the user terminal spectrum fee for satellite services will be calculated based on the unit price factor, spectrum bandwidth used, the congestion of the frequency band where it operates in, the characteristics of the service type and the number of terminals factor. In keeping with the other spectrum fees, the unit price factor  $k$  will be set at \$300.

Below are two illustrative examples of spectrum fee calculations for a general spectrum license for LEO satellite services operating in Ka bands using a 30 MHz bandwidth, based on the provided formula:

### Example 1: 100 User Terminals

In this case, we have 100 user terminals, and the following values:

- $k = 300$
- $Lf = 75$
- $Bf = 0.1$
- $A = 0.15$
- $U = 1.0$

$$\text{Annual Spectrum Fee} = 300 \times 75 \times 0.1 \times 0.15 \times 1.0$$

Thus, the **annual spectrum fee** for 100 user terminals is \$337.5 per terminal (\$28,13/terminal/month).

### Example 2: 50,000 User Terminals

In this case, we have 50,000 user terminals, and the following values:

- $k = 300$
- $Lf = 75$
- $Bf = 0.1$
- $A = 0.15$
- $U = 0.1$

$$\text{Annual Spectrum Fee} = 300 \times 75 \times 0.1 \times 0.15 \times 0.1$$

Thus, the **annual spectrum fee** for 50,000 user terminals is \$33.75 per terminal (\$2.81/terminal/month).

## 6. Implementation Timeline

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The new spectrum fee structure will be implemented following the completion of the consultation process. Stakeholders are invited to provide feedback on the proposed fees, including suggestions for adjustments to the discount factors, frequency bands, and calculation methodologies.

## 7. Invitation for Stakeholder Feedback

We invite telecommunications service providers, satellite operators, and other stakeholders to submit their views and suggestions on the proposed spectrum fees for satellite services. Specifically, we seek input on the following:


- The appropriateness of the proposed approach;
- The keep the spectrum price stability over a 3-year period;
- The application of discount factors for large satellite deployments;
- The appropriateness of the proposed application fee;
- The appropriateness of the proposed registration fee;
- The appropriateness of the proposed value for the factors of the annual spectrum fees formula i.e.  $k = 300$ ; and  $L_f$ ,  $B_f$ ,  $A$ , and  $U$  as listed in Table 1, Table 2, Table 3 and Table 4;
- The relevant spectrum fees for the individual license type; and
- Any other factors that should be considered in the spectrum license fees for satellite services.


## 8. Submission Process

Stakeholders are requested to submit their comments in writing by 25 October 2024. Submissions can be sent to [consultation@anc.tl](mailto:consultation@anc.tl).

Submissions made on behalf of an organization or institution should clearly identify the submitting entity. This includes providing the full name of the organization, the contact details of the individual submitting the response, and their position within the organization. Additionally, please include the organization's official address, phone number, and email contact to ensure proper follow-up and verification if necessary. Submissions without clear organizational identification may not be considered in the final consultation report.

Issued on 25 September 2024

  
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Interim Chairperson





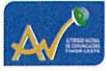
## Annex 1: Application Fees

No application fee is applicable for satellite services.

### **Application fee by Service**

<b>Service</b>	<b>Application Fee</b>
Satellite service	0

Table 5: Application fee by Service



## Annex 2: Registration Fees

### Registration Fees by Service

Service	Registration Fee
Earth station (User Terminal)	5
Earth station (Gateway)	30

Table 6: Registration fees by Service