



## 9. New supply-side indicators:

- \* new spectrum indicators
- \* international roaming

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# 1. New spectrum indicators

- a subgroup in EGTI produced during 2018 a proposal on how to obtain indicators of spectrum available worldwide
- in the last EGTI- 2018 meeting the proposal to introduce two indicators to measure spectrum “capacity” was discussed and adopted.
- the view is that spectrum should be used efficiently to promote the development of ICT services



(1) Spectrum is first **allocated** to a given service

(2) in a subsequent phase, it may be **assigned** to a licensee- a firm or institution- over a geographic area to provide a specific service.

hence,

*spectrum licensed (assigned) ≤ spectrum offered (allocated)*



## Indicator 1:

### Amount of spectrum **offered** for IMT systems, in MHz

Total spectrum, in MHz, *made available for use* (i.e. **allocated**) through any formal national publication, such as the National Frequency Plan, for IMT systems, including any of the air interfaces in accordance with ITU-R Recommendations concerning these standards for mobile communications.

This indicator is broken down by the following bands (indicated in MHz):

- (1) Block < 1 GHz
- (2) Block 1 GHz- 6 GHz
- (3) Block > 6 GHz



## Clarifications and scope:

- 1) This indicator refers to spectrum allocated nationally as identified in National Frequency Plans and other documents that can be considered formal announcements of allocation
- 2) The IMT definition encompasses all IMT versions (IMT-2000, IMT-Advanced, IMT-2020)
- 3) Official documents may use the term IMT or other commercial names, such as 3G, 4G or 5G. All these different denominations should be considered when collecting the data for this indicator
- 4) It should be noted that for all bands listed, countries may allocate and license the full band, or parts thereof depending on the Radio Regulations, Regional and National Allocations.



5) In order to compare the data submitted for this indicator across countries, the “Amount of spectrum offered for IMT systems, in MHz” **will be divided by the spectrum identified for IMT systems in the Radio Regulations (RR) on a per Region basis.**

$$\text{Indicator } 1_i = \frac{\text{amount spectrum *allocated* in band}_i}{\text{recommended spectrum by ITU in band}_i}$$

*i= bands*

# Indicator 1: Amount of spectrum offered for IMT systems, in MHz

This indicator is broken down by the following bands (indicated in MHz):

## 1- Block < 1 GHz:

- a. 450 MHz (450-470)
- b. UHF band (470-608)
- c. 600 MHz (610-69/698)
- d. 700 MHz (698-790/806)
- e. 800 MHz (790/806-902)
- f. 900 MHz (902-960)

## 2- Block from 1 to 6 GHz:

- a. L-band (1427-1518)
- b. 1.7/1.8 GHz (1710-1885)\*
- c. 1.9 GHz (1885-2025)
- d. 2.1 GHz (2110-2200)
- e. 2.3 GHz (2300-2400)
- f. 2.5 GHz, C-band (2500-2690)
- g. 3300-3400
- h. 3400-3500
- i. 3500-3600
- j. 3600-3700
- k. 4.8 GHz (4800-4900)
- l. 4.9 GHz (4900-4990)

## 3- Block > 6 GHz (WRC-19):

- a. 24 250-27 500
- b. 31 800 -33 400
- c. 37 000 -40 500
- d. 40 500 -42 500
- e. 42 500 -43 500
- f. 45 500-47 000
- g. 47 000-47 200
- h. 47 200-50 200
- i. 50 400-52 600
- j. 66 000-71 000
- k. 71 000-76 000
- l. 81 000-86 000



## Indicator 2:

### Amount of spectrum **licensed** for IMT systems, in MHz

Total spectrum, in MHz, **assigned** nationally **for use** for IMT systems, including any of the air interfaces in accordance with ITU-R Recommendations concerning these standards for mobile communications. Assignment implies granting a specific block in a specific frequency band to a firm or institution (a licensee).

This indicator is broken down by the following bands (indicated in MHz):

- (1) Block < 1 Ghz
- (2) Block 1 GHz- 6 GHz
- (3) Block > 6 GHz





## Clarifications and scope:

- 1) This indicator refers to **national spectrum that has been assigned to a given operator as a result of an assignment process** (e.g. auction, beauty contest....).
- 2) The IMT definition encompasses *all IMT versions* (IMT-2000, IMT-Advanced, IMT-2020).
- 3) Official documents may use the term IMT or other commercial names, such as 3G, 4G or 5G. All these different denominations should be considered
- 4) for all bands listed, ***countries may allocate and license the full band, or parts*** thereof depending on the Radio Regulations, Regional and National Allocations.



## **Method of collection:**

Data can be collected from the national administration responsible for licensing spectrum, such as the telecommunication regulator, the ministry or another public administration in charge of spectrum management.

In addition, data are often publicly available through press releases informing of the outcomes of spectrum assignment processes.



## **Relationship with other indicators:**

This indicator is related to the indicator “Amount of spectrum offered for IMT systems, in MHz”. Spectrum is first allocated to a given service and, in a subsequent phase, it may be assigned to a licensee. As a result, “Amount of spectrum licensed for IMT systems, in MHz” should be lower than or equal to “Amount of spectrum offered for IMT systems, in MHz”.



## The indicator is a *relative* measure:

In order to compare the data submitted for this indicator across countries, the “Amount of **spectrum licensed** for IMT systems, in MHz” **will be divided by the spectrum identified for IMT systems in the Radio Regulations (RR) on a per Region basis.**

In the calculation of the spectrum identified for each Region, each band will be considered as identified for IMT systems for the Region based on the percentage of countries in the Region having identified a band for IMT systems in the RR footnotes.

$$\text{Indicator } 2_i = \frac{\text{amount spectrum licensed in band}_i}{\text{recommended spectrum by ITU in band}_i}$$

*i= Bands*

Total spectrum, in MHz, assigned nationally for use for IMT systems, including any of the air interfaces in accordance with ITU-R Recommendations concerning these standards for mobile communications.

This indicator is broken down by the following bands (indicated in MHz):

**1- Block < 1 GHz:**

- a. 450 MHz (450-470)
- b. UHF band (470-608)
- c. 600 MHz (610-69/698)
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## Example (1):

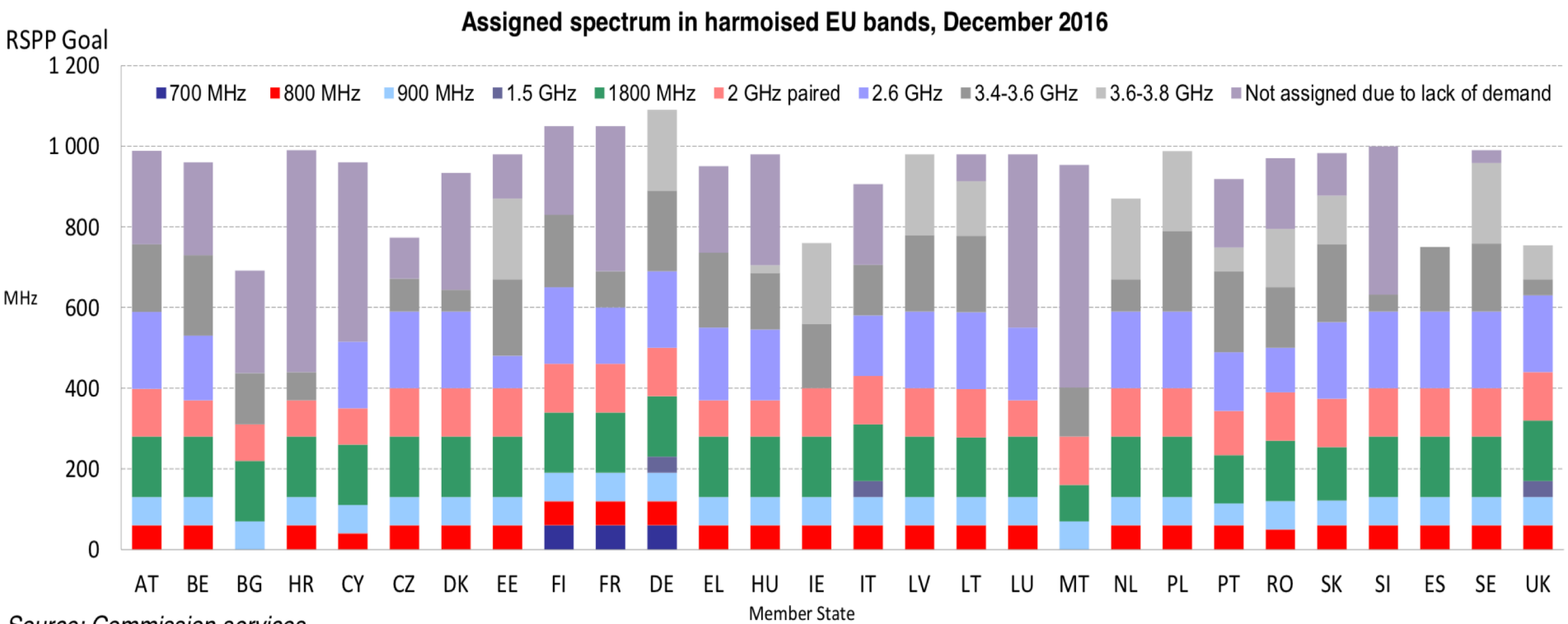
The European Commission collects data on **assigned spectrum** for wireless-broadband services in harmonized European Union (EU) bands.

These data are regularly collected and published in order to monitor the progress towards the target of 1200 MHz for wireless-broadband services set by the EU Radio Spectrum Policy Programme (RSPP).

The data collection is carried out separately by band, which allows to track, for instance, the progress achieved by EU Member States in assigning the 800 MHz band (the 'digital dividend') for wireless-broadband services.



- By 2016 still 30% of harmonized spectrum in the EU(28) had not been assigned for wireless broadband
- The 800 MHz band (“digital dividend”) has been assigned in 25/28 countries



Source: Commission services

Note: Assigned spectrum include guard bands







## 2. International roaming

When in a foreign country and not using your subscribed network, you either use

- **Roaming-in:** when receiving a call while in a foreign country
- **Roaming-out:** when making a call while in a foreign country to your own country



## Mobile-broadband Internet traffic outside the country- **roaming out** (136mwo)

Mobile-broadband Internet traffic (outside the country, roaming out) refers to **broadband traffic volumes originated outside the country** from 3G networks or other more advanced mobile-networks, including 3G upgrades, evolutions or equivalent standards in terms of data transmission speeds. Traffic should be collected and aggregated at the country level for all customers of domestic operators roaming outside the country.

**Download and upload traffic should be added up** and reported together. Traffic should be measured at the end- user access point.

***Wholesale and walled-garden traffic should be excluded.***

Traffic should be reported in **exabytes**.



### 3. Quality of Service indicators (QoS).

EGTI discussed during last years the **Quality of Service** (QoS). As an outcome of the discussions, the indicators on QoS collected in ITU questionnaire were reduced to the following three:

- (1) mobile-cellular unsuccessful call ratio;
- (2) mobile-cellular dropped call ratio; and
- (3) service activation time for fixed-broadband services.



- Given the relevance of QoS indicators for national regulatory authorities and the progress made in monitoring QoS at the national level in the last years, EGTI agreed to create a sub-group to revise the existing QoS indicators included in the ITU Long Questionnaire based on a common reduced list of QoS indicators relevant to most countries at the international level.
- In the EGTI meetings and online forum several interesting experiences in different countries been explored (Oman, Brasil....)



**Thank you !!!!**