Coalizione del Fixed Wireless Access
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Public Consultation on DRAFT RSPG Opinion on spectrum related aspects for next-generation wireless systems (5G)

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Position paper of Coalition of Fixed Wireless Access

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Index

The Coalition of Fixed Wireless Access 3
Introduction 4
1. Enabling ultrabroadband connectivity 4
2. Digital Agenda for Europe 2020 6
3. The Italian ultrabroadband strategy 8
4. Enhancing FWA potentiality 8
5. 1 GHz for Fixed Wireless Access 10
Conclusion on RSPG opinion for 5G spectrum aspects 11

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THE COALITION OF FIXED WIRELESS ACCESS[1]

Fixed Wireless Access (FWA) technology allows to supply connectivity services through radio spectrum, without requiring deployment of ducts and cables for the so called "last mile" segment. This feature assures FWA highly reduced period and cost of deployment compared to wired networks. Thanks to this, **FWA networks had an important role in reducing** the first step of **digital divide** (2 Mbps) and is having a similar one also in the second step[2] (30 Mbps), **especially in sub-urban and rural areas.**

Our country has more than 8.000 municipalities, a forth with less than 1.000 residents and a half with less than 2.000. A so fragmented scenario is an output of **our typical orography** (we have Alps, Apennines, islands, lakes and valleys), which **is frequently not suitable to deploy and maintain a** traditional **wired network**, both from an economic and engineering point of view.

Nowadays, the Italian **FWA operators count more than one million of residential and business customers**, with a sharply rising trend of customer base which, since 2014, is constantly highlighted in quarterly reports of the Italian NRA for communications (AGCom)[3].

Current performances of FWA technologies allow operators to supply connectivity services **up to 1 Gbps to business customers**, with point-to-point equipment (P-P), and **up to 30 Mbps to households**, with point-to- multipoint equipment (P-MP). Moreover, R&D current state of play foresees an upgrade of **FWA offer to households**, with services up to 50 Mbps by the end of 2016 and up to **100 Mbps by the end of 2018**.

In our country, Fixed Wireless Access technology represents the only one example of that infrastructure based competition on which the whole European regulatory framework is founded on. Moreover, this feature is pointed out as a key factor to achieve development of ultrabroadband services and Digital Agenda for Europe targets.

The Italian companies of the FWA recently decided to group themselves into a Coalition able to give an **institutional representation to the whole production chain**, from vendors and tower companies to wireless internet service providers (WISP), system integrators and satellite operators. This association of **more than 60 participants** is now ready to play an active role (complementary to optical fiber networks in big urban areas) within the Italian government strategy for ultrabroadband.

[1] The Coalition registered for Transparency Register of EU with id 878276822865-94.
[2] See http://www.governo.it/sites/governo.it/files/strategia_banda_ultralarga.pdf, page 96.
[3] i.e. http://www.agcom.it/documents/10179/5178152/Allegato+18-7-2016/99f350d2-b699-481c-9ec1-ef8b0977b2f3?version=1.0.

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INTRODUCTION

CFWA really welcomes the RSPG's efforts in developing a European spectrum strategy for introduction of 5G and, moreover, the fact that a related evaluation from stakeholders has been required. It is also significant to note that this strategy is expected to drive the Union towards a **new generation of wireless paradigm**, able to provide a wide range of **innovative mobile services** (i.e. IoT, M2M, etc.) and **universal access to ultrabroadband** connectivity for each European citizen.

Considering the necessity to pursue and realize both the just mentioned targets, the Coalition would like to underline contribution that Fixed Wireless Access (FWA) could provide to achieve the second objective. In this context, it is strictly important that **development of** Europe's spectrum policy strategy regarding **mobile service would not challenge** achievement of **universal** and **fixed access to ultrabroadband connectivity**. Especially considering the different background conditions and state of play that each Member State is experiencing in achieving Digital Agenda for Europe targets.

1. ENABLING ULTRABROADBAND CONNECTIVITY

The European Commission stated in his 2013 Guidelines for deployment of broadband networks that "at the current stage of market and technological development, **NGA networks are**: (i) fiber-based access networks (FTTx); (ii) advanced upgraded cable networks; and (iii) certain **advanced wireless access networks** capable of delivering reliable high speeds per subscriber". Furthermore, such orientation is also confirmed in the "Digital Agenda Scoreboard", where NGA networks, beyond traditional optical fiber ones, comprises "technologies other than FTTH, FTTB, VDSL and Cable NGA, which are capable of at least 30 Mbps download".

More in depth, considering that FWA protocols, differently from those used for mobile communications, are not required to constantly manage handover and interoperability, and that the related connectivity service is provided

(i) ensuring **Line of Sight** (LoS) between transmission site (BTS) and customer location
(ii) equipping user site with a small **antenna**
(iii) just only to a **fixed location**

It is clear that FWA performances are strictly comparable (and better) to those typical of LTE-5G. The chart below describes a **wide range of technologies able to provide innovative and ultrabroadband services** in a fixed location, FWA included.

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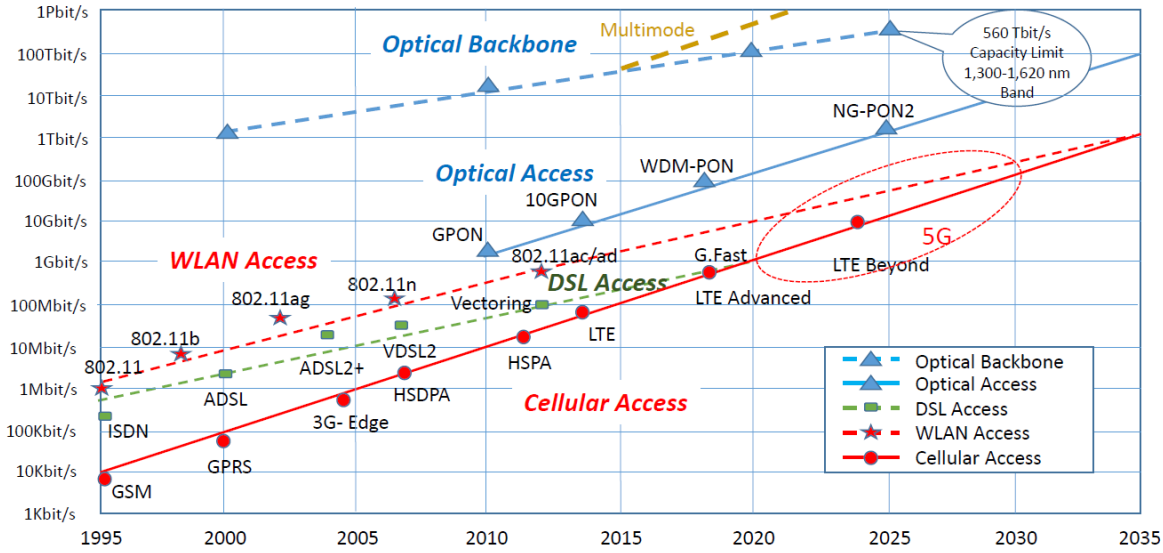

Figure 1: Source of Prof. M.Dècina (2014), based on data by Bell Labs, G. Fettweis, and others

The following illustration shows as currently available Point-Multipoint (P-MP) **FWA applications have a spectrum efficiency of 30 bps/Hz**, thanks to implementation of Massive User – Multiple Input Multiple Output (Massive MIMO) paradigm. While **mobile solutions still remain under these performances**, because of the large availability of spectrum for mobile operators and the possibility to perform carrier aggregation (2 or 4 channels).

Considering that in addition to mobile services, spectrum policy for introduction of 5G should ensure universal access to ultrabroadband connectivity, the Coalition suggests to RSPG the **inclusion of FWA applications within those useful to realize the strategy**, consequently acting in related spectrum policy framework.

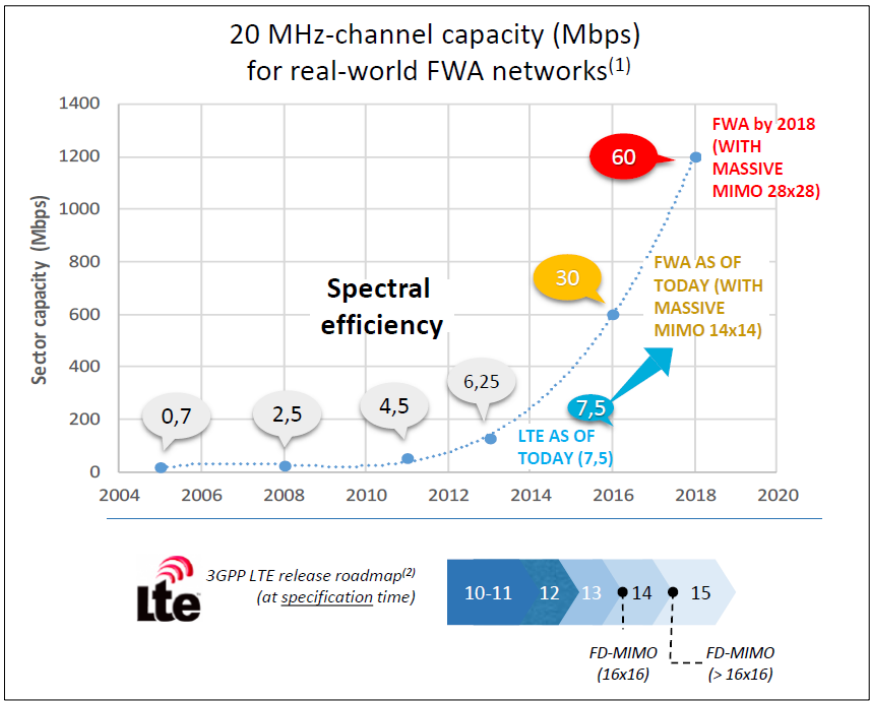

Figure 2 Source of Cambium Networks (1) and Qualcomm (2)

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2. DIGITAL AGENDA FOR EUROPE 2020

In 2010, the Commission called[4] for adoption of the Digital Agenda for Europe. Taking in account a group of undesirable evidences differently observed through the Union, like as fragmented digital markets, lack of investment in networks and digital skills, the Agenda have been adopted to deliver sustainable economic and social benefits from a digital single market based on fast and ultrafast internet and interoperable applications.

Among others, the Agenda fixed **a common target of internet connection availability** to whole of the citizens. In detail, ensuring by 2020 (i) all Europeans have access to internet speeds above 30 Mbps and (ii) 50% or more of European households subscribe internet connections above 100 Mbps.

Nowadays, the Commission is constantly evaluating output of different actions that each country is realizing to reach the connectivity objectives. Indeed, within **Digital Single Market Strategy**[5], the Commission measures progress of the European digital economy through implementation of a Digital Scoreboard[6] and update of a proper Digital Economy and Society Index (DESI).

The below charts are part of evaluation of the connectivity indicator[7] within DESI and show European fast broadband (at least 30Mbps) household penetration between 2010 and 2015 and, for each country, the penetration in 2015.

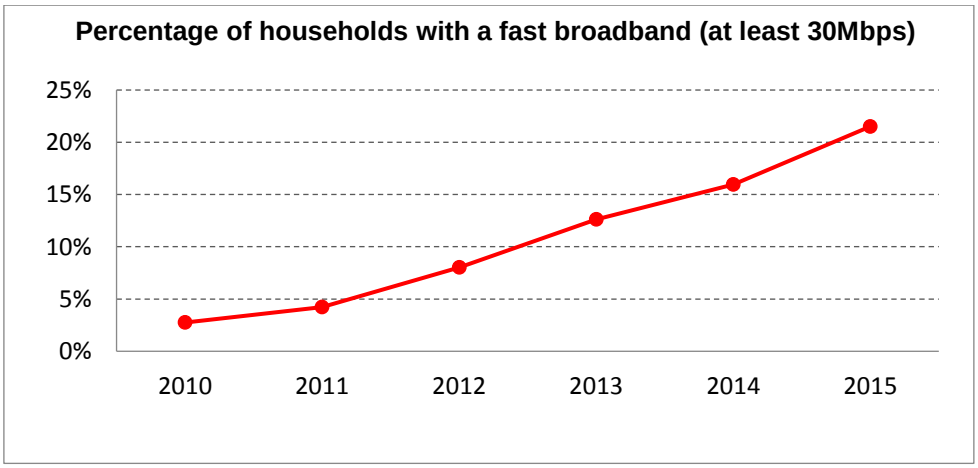

Figure 3

[4] Communication from the Commission to the European Parliament, the Council, the Social Committee and the Committee of the Regions, COM (2010) 245 final A Digital Agenda for Europe.
[5] The Digital Single Market strategy, adopted on the 6 May 2015, includes 16 initiatives to be delivered by the end of 2016. The initiatives are based on three pillars: Access (better access for consumers and businesses to digital goods and services), Environment (creating the right conditions and for digital networks and innovative services), Economy & Society (maximising the growth potential of the digital economy).
[6] https://ec.europa.eu/digital-single-market/en/digital-scoreboard.
[7] Europe's Digital Progress Report 2016 – Connectivity, https://ec.europa.eu/digital-single-market/en/download-scoreboard-reports

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A little bit more than **a fifth of European homes subscribed a fast broadband access of at least 30 Mbps** in 2015 (22%), with a significant increasing since 2010.

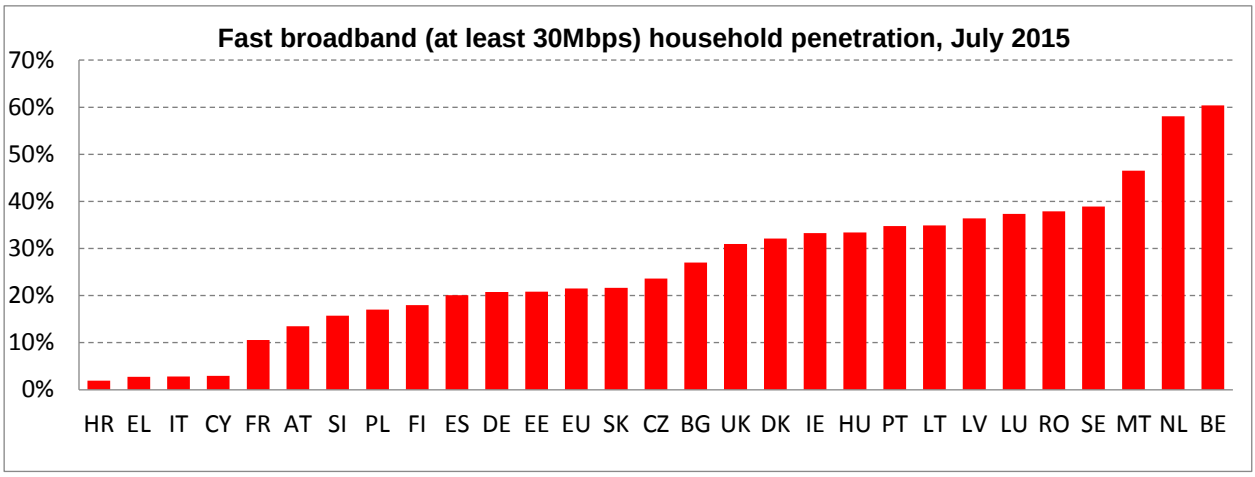

Figure 4

In Belgium and the Netherlands more than half of homes already subscribes fast broadband, while in Croatia, Greece, Italy and Cyprus, high-speed services still remain marginal.

The output of these charts confirms that **a large part of Europe appears still far away from achievement of the Digital Agenda for Europe targets** in terms of connectivity.

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3. THE ITALIAN ULTRABROADBAND STRATEGY

In line with objectives of the DAE 2020, on 3 March 2015 the Italian government issued his Ultrabroadband Strategy[8] (the Strategy). In this document, **Italy aims to allow 85% of households and all public buildings** (in particular schools and hospitals) **to have access to at least 100 Mbps and the remaining part of the population to at least 30 Mbps speed**.

As part of the Strategy, **Italy designed** a nationwide framework scheme consisting of carefully **targeted public sector interventions**, primarily, to realize a FTTN (Fiber to the Node) infrastructure in the most peripheral areas[9] of the country (also known as clusters C and D). The deployment should be carried out by market players chosen by Infratel Italia SpA (the in-house company of the Ministry for Economic Development) through different public tenders.

In detail, the plan aims to cover all households belonging to cluster D with connections able to provide at least 30 Mbps while, for cluster C, 70% of the households will have access to connections with at least 100 Mbps and the remaining 30% to connections with at least 30 Mbps.

It is important to note that **the interventions will be deployed in a situation of telecommunication infrastructures and broadband penetration deeply under developed** compared to the most advanced European countries and the DAE 2020 targets. In other words, as noted in Figure 4, in 2015 Italy was third to last country in European fast broadband household penetration and still far away from achievement of the above mentioned connectivity objectives.

4. ENHANCING FWA POTENTIALITY

Nowadays, the largest part of FWA operators provides his connectivity services through **unlicensed 5GHz spectrum** and through **licensed 24.5 – 26.5 GHz and 27.5 – 29.5 GHz**, also known as Wireless Local Loop (WLL) band. For WLL, the Italian Ministry for Economic Development (MiSE) is currently performing a second stage[10] of the allocation procedure started in 2002.

Moreover, at the end of 2015 AGCom issued[11] the **guidelines for allocation and usage of 3.6-3.8 GHz** band, introducing an innovative mechanism of geographical shared access to the spectrum. In depth, the NRA identified two types of cluster, "town" and "territory", to manage through two different frameworks.

[8] http://www.governo.it/sites/governo.it/files/strategia_banda_ultralarga.pdf.
[9] Piano degli Investimenti mediante Intervento Diretto nelle Aree a Fallimento di Mercato, Addendum alla Consultazione Pubblica ai sensi dei paragrafi 64 e 78 degli "Orientamenti dell'Unione europea per l'applicazione delle norme in materia di aiuti di Stato in relazione allo sviluppo rapido di reti a banda larga".
[10] http://www.fub.it/gara_wll/gara_wll.php#stato.
[11] Del. 659/15/CONS available at http://www.agcom.it/documents/10179/3485599/Delibera+659-15-CONS/b6dc88ed-4cc8-43b7-bbec-e55ed1f8dad9?version=1.0

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This choice appears more reasonable taking in account what the Authority stated, in the mentioned guidelines, referring to the contribution of Fixed Wireless Access and usage of **3.6-3.8 GHz frequencies, particularly suitable to provide fixed radio access in rural areas** (or cluster "territory")[12].

Consequently, conclusion of the still ongoing allocation procedures of this band, in charge of MiSE, is expected to partially solve the European Commission concerns about a "*lack of sufficient investment notably in rural areas, problems which will not be fully resolved in the context of the ongoing discussions on the Telecoms Single Market package*"[13].

Generally speaking, it is clear that performances of Fixed Wireless Access are mostly determined by spectrum availability and efficiency. Currently situation highlights that **spectrum available for this technology is no more sufficient** to allow development of FWA. At the same time, this circumstance already obliged FWA vendors and operators to sharply increase efficiency in frequency usage, which on the other side decreased network scalability.

In other words, the following chart help us to resume the current situation of spectrum availability: in order to step up from yellow zone (present) to the green one, FWA operators need to access more spectrum sources.

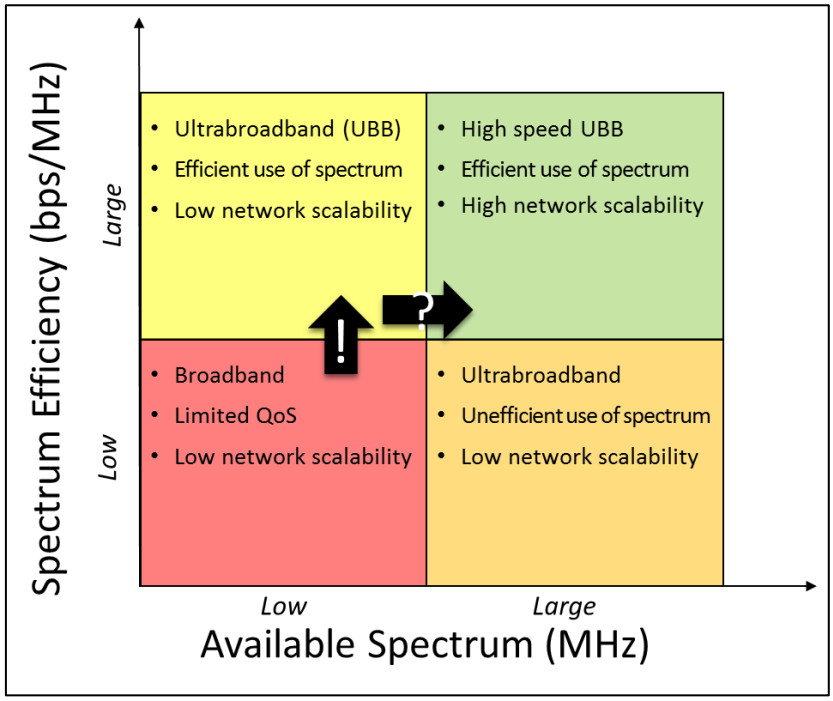

Figure 5: Prof. M. Dècina, Wireless Technologies (2016)

[12] Del. AGCom 659/15/CONS, Par. 73.
[13] Digital Single Market Strategy, par. 3.1

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5. 1 GHz FOR FIXED WIRELESS ACCESS

Far away from selected and valuable low spectrum bands and taking into consideration the wide part of frequency sources already allocated to mobile operators[14], the Coalition would like to suggests RSPG a **group of frequencies which appears ready to be allocated to FWA operators** and promote support of UBB services.

Band (MHz)	Range (MHz)	Note
2.300 - 2.400	**100**	• Licensed Shared Access band • Trial started by Italian Ministry of Development should include FWA vendors and operators
3.400 – 3.600	**200**	• Allocated to few operators • Scarcely used in remote areas
3.600 – 3.700	**100**	• Scarcely used in the whole country • Should be already allocated since 2008[15]
3.700 – 3.800	**100**	• Empty band • Should be already allocated since 2008
3.800 – 4.200	**200**	• Empty band since no more coupled with 3.6-3.8 GHz
5.350 – 5.470	**120**	• Scarcely used by Ministry of Defense • Close to 5.4 GHz already used by FWA operators
5.725 – 5.875	**150**	• Scarcely used by Ministry of Defense • Close to 5.4 GHz already used by FWA operators

[14] Which frequently originated the so called phenomenon of “over-hoarding”.
[15] As asked by Commission in Del. 2008/411/CE and 2014/276/UE.

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CONCLUSION ON RSPG OPINION FOR 5G SPECTRUM ASPECTS

Taking in account all previous considerations on:

- The two streams of strategy for **5G** introduction and especially that **referred to universal ultrabroadband access** for all the Europeans
- **Positive perspectives of FWA** technologies and related role **within the 5G strategy**
- **Difficulties** observed **in reaching the DAE 2020 targets**, which highlights the importance of **Fixed Wireless Access** industry, notably in sub-urban, rural and remote areas
- Need of **more spectrum** to enhance FWA contribution in granting **universal access to ultrabroadband**

The Coalition of Fixed Wireless Access asks RSPG to

- **Preserve frequency bands currently allocated to Fixed Wireless Access** operators from changes in destination usages (3.4-3.6 GHz, 3.6-3.8 GHz, 24.5 – 26.5 GHz and 27.5 – 29.5 GHz), included those addressed to RadioLan shared access (2.4 GHz, 5.6 GHz and 17.2 GHz)
- Act to find **new spectrum sources for FWA operators**, in order to enhance their contribution to full deployment of universal ultrabroadband access (i. e. 2.3-2.4 GHz, 3.8-4.2 GHz, 5.2 GHz, 5.8 GHz)
- Allow single Member States to **gradually e differently reserve spectrum bands for 5G** deployment
- Push the Italian Ministry for Economic Development to **conclude allocation** procedures of **3.6-3.8 GHz**.

Coalition of Fixed Wireless Access
Secretary and Treasurer
Antonio Rita