

Review of the Electronic Communications Regulatory Framework

Executive Summary 3: Wireless networks and spectrum

1. General context and objectives

Spectrum is an essential resource for the provision of electronic communications, on which an increasing number of sectors and new wireless communications technologies rely. **New spectrum management methods are emerging and demand for spectrum is still growing significantly** due to the increase in wireless traffic driven by existing and new services and applications. Connectivity for **5th generation wireless communications** (5G) (connected cars, health-related services, smart cities etc.), will require up to 56 GHz of additional spectrum and calls for a timely access to spectrum and targeted improvements in spectrum management¹.

Therefore, the provisions on spectrum of the proposal for a European Electronic Communications Code aim at:

- (i) ensuring advanced connectivity by guaranteeing a faster time to market of spectrum resources;
- (ii) promoting sufficient investments to meet tomorrow's economic challenges, such as denser 5G networks, by simplifying regulatory intervention and ensuring greater consistency and predictability in spectrum assignment, in such a way as to avoid the delays and unpredictability that characterised some assignment processes for 4G in the past;
- (iii) responding to the new spectrum management challenges raised by the development of 5G communications.

2. Proposed solutions

2.1. Advanced connectivity for all citizens and for the EU economy

The Code includes, as one of its general objectives, ensuring widespread availability and take-up of very high capacity fixed and mobile connectivity for all EU citizens, including along major transport paths (Article 45(2) (a) and (b)) and proposes means to improve coverage. The aim is not to harmonise coverage conditions attached to spectrum rights of use but rather to promote the use of such conditions in suitable spectrum bands and convergence in the use of the *parameters* which frame such coverage conditions (e.g. methods for determining coverage obligations, taking into account similarities in regional geographical characteristics, population density, economic or network development and evolution of demand - Article 47(3)). Moreover, to reinforce such measures and promote efficient spectrum use, competent authorities would have clearer powers to verify operators' compliance with the conditions attached to spectrum usage rights, including coverage conditions (Article 30 together with Articles 18, 19 and 47). To ensure territorial coverage, competent authorities would be empowered to authorise sharing of mobile infrastructure or spectrum (Article 47(2)). In exceptional cases, politically independent national regulatory authorities could impose such sharing on fair and reasonable terms where replication of mobile infrastructure is

¹ The Commission's proposal of February 2016 to allocate mobile spectrum within the 700 MHz band for wireless broadband was a first major step towards further and better coordination of spectrum availability.

inefficient and connectivity is severely deficient or the choice and/or quality of service is severely restricted (Article 59(3)).

Cross-border interference can be a major impediment to network performance and to releasing new bands for electronic communications. The Code would reinforce RSPG's efforts to date to solve problematic cross-border harmful interference between Member States (so-called RSPG "good offices") by empowering the Commission to make the solutions developed by the RSPG legally binding (paragraphs 3 and 4 of Article 28). The Code also clarifies the obligation for Member States not to prevent other Member States from using the spectrum which has been harmonised, and to cooperate with each other to solve any problem of harmful interference, bilaterally and through the RSPG (paragraphs 1 and 2 of Article 28).

The Code also seeks to promote end-user **access to R-LAN (Wi-Fi) based connectivity**. In addition to the WiFi4EU proposal to promote Internet connectivity in local communities through vouchers for installation of Wi-Fi access equipment by public authorities, the Code proposes to allow and encourage public authorities and private individuals, community and business users to offer free Wi-Fi connectivity to end-users (Article 55). R-LANs (radio local access networks) not only increase access to the internet for end-users but also allow for mobile traffic off-loading by mobile operators. A study from 2013 estimated that delivering all the 2016 RLAN data traffic in the EU via mobile networks would have required additional infrastructure investments of €200bn to cope with the projected demand².

In order to ensure that regulatory intervention that directly shapes the market structure is well targeted, the Code sets out objective criteria and mechanisms for a consistent application by independent national regulatory authorities of measures already provided for in the Radio Spectrum Policy Programme of 2012, such as the use of spectrum caps, spectrum reservation for new entrants in spectrum auctions or wholesale access obligations attached to licence conditions, in order to promote effective competition and avoid distortions of competition in the internal market (Articles 35 and 52). The requirement for an objective and forward-looking assessment of competitive conditions and for justification of any such measures and the assessment of their effects provides a transparent and predictable framework for all market participants, which will further promote advanced network roll-out.

2.2. More predictability and legal certainty to support investments

The Code proposes **25-year minimum individual spectrum usage rights** to ensure return on investment and provide upfront predictability for all market players to incentivise more rapid roll-out of advanced, denser networks (Article 49). At the same time, it would counter-balance such rights' duration by more rigorous requirements and increased means to ensure that spectrum is used effectively and efficiently, through 'use it or lose it' mechanisms (Article 19 with Articles 30 and 47). This is all the more important because demand for spectrum and for multiple usages is exponentially increasing.

The Code facilitates the **acceleration of the assignment of newly harmonised spectrum bands** through the coordination of assignment deadlines by implementing decisions, including transitional measures regarding the duration of rights (Article 53). The Code also proposes clear new rules for the renewal of existing rights by competent authorities, subject to open, transparent, non-discriminatory procedures and criteria, to ensure sufficient prior notice and thus more continuity in investments, (Article 50).

² Study on the "Impact of traffic off-loading and related technological trends on the demand for wireless broadband spectrum", WIK/Aegis, 2013 (SMART 2012/0015).

The Code aims at increasing the **consistency of selection procedures and conditions** attached to spectrum usage rights through a **peer review** where BEREC is in the lead – drawing on its members’ economic expertise and market knowledge – in order to promote best practice and predictability for all investors, including international investors, and ensure swift, efficient and transparent spectrum authorisation processes (Article 35). Politically independent national regulatory authorities would therefore be entrusted with determining only the assignment rules and usage right conditions which take due account of the market structure and competitive situation, including conditions for entry and expansion. Beyond the specification of regulatory and market-shaping measures on competition grounds (foreseen in Article 52), the national regulatory authorities will be entrusted to define the parameters for spectrum economic valuation, the means to define coverage conditions attached to usage rights in accordance with national policy objectives set out by competent authorities as well as the choice of the selection process, the bidder eligibility criteria, the duration of individual rights and renewal conditions and finally, any condition related to spectrum assignment, transfer or sharing. The peer review process would be limited to these aspects too.

The case-by-case consistency check mechanism by peers can be complemented by implementing measures setting out **a framework of criteria for the choice and determination of selection procedures and conditions** attached to spectrum usage rights, based on an RSPG opinion, which Member States shall take into account when assigning a specific band in their territory in light of the specific national circumstances.

The Code also provides for **predictable conditions for spectrum trading and leasing** to promote greater flexibility for accessing spectrum resources and for ensuring that spectrum is delivered to the EU market in a timely manner (Article 51). It also reinforces the principle that **fees** including auctions proceeds – which are Member States’ property - should promote optimal use of spectrum resources – they should be set in such way as not to unduly burden investments and payment modalities shall be linked to actual spectrum availability (Article 42).

Finally, the Code would facilitate the rapid and easy installation of **wireless small-cell access points** meeting basic technical requirements, which could be defined in an implementing measure, which should contribute to **reducing costs** of deploying very dense networks of such small cells, which is key to support the development of 5G networks, services and applications (Article 56).

2.3. Increased spectrum use efficiency for 5G development

The deployment of 5G is likely to involve high frequency spectrum bands with very short range, or a mix of frequency bands with different characteristics capable of addressing the versatile requirements of 5G.³ The related market and technical developments, as well as fixed-wireless convergence, require an adaptation of the authorisation regimes for these new bands, for which general authorisations and/or a mix of general authorisation and individual licensing are likely to be most appropriate. As a consequence, the Code seeks to ensure a comprehensive and common approach to authorisation regimes by Member States in future bands and for future usages and applications.

The Code seeks to ensure that the **least onerous authorisation regime** possible is applied for the use of spectrum, i.e. use of general authorisation whenever possible to allow multiple users (Article 46).

³"5G will not only be an evolution of mobile broadband networks. It will bring new unique network and service capabilities. Firstly, it will ensure user experience continuity in challenging situations such as high mobility (e.g. in trains), very dense or sparsely populated areas, and journeys covered by heterogeneous technologies. In addition, 5G will be a key enabler for the Internet of Things by providing a platform to connect a massive number of sensors, rendering devices and actuators with stringent energy and transmission constraints. Furthermore, mission critical services requiring very high reliability, global coverage and/or very low latency, which are up to now handled by specific networks, typically public safety, will become natively supported by the 5G infrastructure." (ITU 5GPP vision document).

This will stimulate the development of new communications services and allow more efficiency through flexibility in the use of spectrum. It will also allow service providers and consumers to benefit from the economies of scale of the single market, as the same bands can be freely available throughout the EU on similar conditions (e.g. as for Wi-Fi). Member States will continue to be able to grant individual rights of use, including on an exclusive basis, where necessary to maximise efficient use of spectrum in light of demand, taking into account the specific characteristics of the spectrum and the need to protect against harmful interference.

This provision also seeks to encourage a **better combination of the use of general authorisations and individual rights** when authorising spectrum usage and setting conditions attached to such rights, or sharing solutions involving individual but non-exclusive rights (licensed shared access). EU technical harmonisation measures under the Radio Spectrum Decision for future bands could be accompanied by implementing decisions on the modalities of application of general or individual authorisation to a specific band, based on an opinion from RSPG, with a view to ensuring a common approach to authorisation in the new bands in the EU which is at the same time compatible with the harmonised technical conditions.

Several criteria are defined to determine the **amount and type of spectrum** to be assigned (Article 47) and the most appropriate authorisation regime (Article 46).

In order to seek the right balance between ensuring sufficient harmonised spectrum throughout the EU and appropriate consideration of different national circumstances, the Code also foresees the possibility to grant some **flexibility** in spectrum use at national level in exceptional cases where demand for harmonised spectrum does not immediately materialise in that Member State, as a means of increasing the effective and efficient use of spectrum overall (Article 45(3)).

The Code also encourages **voluntary pan-EU or multicountry joint authorisation processes** among Member States to support rapid network deployment and provision of innovative services in markets with similar characteristics in terms of demand, consumer pattern, operators, etc. (Article 37).

Finally, the Code provides **clearer powers** for competent authorities to impose obligations to use spectrum efficiently, to avoid hoarding practices and to impose sanctions or withdraw spectrum usage rights in case of non-compliance with the conditions attached to the rights - 'use it or lose it' mechanism (Article 30).