

# The regional management of radio frequencies in Europe, a high level of harmonization through cooperation between the EU, CEPT and ETSI

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## **Abstract:**

The regional management of radio frequencies is part of the world organization of the International Telecommunication Union (ITU), which sets the rules for avoiding interference among the frequencies used in member states. It also fits in with the national, sovereign bodies that manage the radio-frequency spectrum within each country's borders and assigns bandwidths. This regional management allows for harmonizing bandwidths, which is indispensable for economies of scale, the operation of the European single market, and the effective operation of bandwidths in border zones. Harmonization in the EU focuses on the uses of radio frequencies and the marketing of equipment in this sector. This involves close cooperation with the European Conference of Postal and Telecommunications Administrations (CEPT), which studies the compatibility of uses and harmonizes frequency assignments, the European Telecommunications Standards Institute (ETSI), which drafts standards for harmonization, and the European Union, which may impose rules for harmonization in the single market. Through regional cooperation, questions about fair access to radio frequencies in border zones are handled and joint proposals drafted for ITU conferences.

## **The regional management of frequencies**

The regional management of radio frequencies relies on the global framework established by the Radio Regulations (RR) adopted by the International Telecommunication Union (ITU). Like the ITU, regional organizations define mandatory rules and guidelines for using frequencies in nations in the region.<sup>1</sup>

To set regulations about radio frequencies for its member states, the ITU has opted for sovereignty: each state has laws for managing the spectrum as it wants on condition that the rights of other member states not be affected. The outcome has been a rather supple harmonization of global services: radio communications in space, in the air, and on the sea; and, too, of transmissions via frequencies for mobile communications since the IMT (International Mobile Communication) specifications for 3G; not to mention the many other uses of frequencies (transportation on land, private networks, the IoT, Wi-Fi, etc.).

In conformity with the ITU's regulations, regional organizations and national authorities decide how to assign frequency bands for various uses (services). In the case, for example, of mobile phone operators or content-providers for radio and television, competent public administrations or regulatory authorities set the conditions for granting authorizations (licenses) to use frequencies.

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<sup>1</sup> This article has been translated from French by Noal Mellott (Omaha Beach, France). The translation into English has, with the editor's approval, completed a few bibliographical references. All websites were consulted in October 2020.

Regional organizations exist nearly everywhere around the world. Two main reasons account for this. At the global level, the rules and regulations adopted by the ITU are not always suited, in practice, to managing radio frequency assignments in border areas, in particular for radio services that might be incompatible over distances up to several hundred kilometers. In addition, harmonizing the use of frequencies is a lever for regional economic cooperation between neighboring countries, especially those in free-trade agreements (EU, NAFTA, ASEAN, etc.). These two reasons carry more weight in Europe than elsewhere owing to the Single Market and given the number of border areas due to the small size of countries.

In fact, Europe is the region where the regional management of the spectrum has advanced the farthest, thanks to EU institutions: the European Conference of Postal and Telecommunications Administrations (CEPT, an organization that, though not well known, is essential to the management of radio frequencies on the continent) and other organizations, such as the European Telecommunications Standards Institute (ETSI, which sets standards for telecommunications and radio equipment). Other regions have set up their organizations, sometimes on the model of the CEPT. Such is the case of the five other regional organizations recognized by the ITU for preparation of its world radiocommunication conferences (WRCs):

- The Inter-American Telecommunication Commission (CITEL), an entity of the Organization of American States (OAS), also makes recommendations about using the spectrum.
- The Asia-Pacific Telecommunity (APT) publishes reports by its Wireless Group (AWG).
- The Regional Commonwealth in the Field of Communications (RCC) represents the republics that used to make up the USSR.
- The Arab Spectrum Management Group (ASMG).
- The ATU (African Telecommunications Union).

Other forms of regional cooperation have also emerged, for instance: the ASEAN Spectrum Policy Forum (ASPF).

## **Frequency management in the EU: The CEPT**

Created in 1959, the CEPT groups the post office and telecommunication administrations of 48 European countries, including small ones like Vatican City and Monaco, as well as countries in eastern Europe, such as Russia, Georgia and Azerbaijan. In fact, Armenia is the only country normally considered to be in Europe that does not belong to the CEPT.

The CEPT is organized around three main committees, the president of each committee being a copresident of the CEPT. Radio-frequency management is in the hands of the Electronic Communications Committee (ECC), a concentration of European expertise on the radio-frequency spectrum. The CEPT and ECC have signed agreements of cooperation with: other regional organizations recognized by the ITU; the European Commission (EC); standards-making organizations in Europe (ETSI and CENELEC — the European Committee for Electrotechnical Standardization); and several sectoral associations or trade groups.

The Electronic Communications Committee (ECC) is the ultimate source in the CEPT of decisions about frequency management. It has several work groups and project teams. Manufacturers are free to take part in the project teams and as observers at ECC work group meetings. Participants are numerous, for example, more than a hundred representatives from industry in the project team on mobile communications (4G, 5G...).

The CEPT has a standing organization, the ECO (European Communication Office) with a dozen persons on staff based in Copenhagen. It provides experts and helps organize the CEPT's work. It administers websites ([www.cept.org](http://www.cept.org) and <https://efis.cept.org/>), organizes public hearings and workshops for exchanges or training, develops tools (SEAMCAT), follows up on the activities of other organizations (ETSI in particular), etc.

## **The regional organization in Europe for licensing radio frequencies**

For a long time now, harmonization of the spectrum in Europe has been based on ECC decisions and recommendations about assigning bands to certain services and defining the related technical conditions. This harmonization has been a response to demands usually from industry (formulated through a tested process involving the CEPT and ETSI) or sometimes from public administrations. It comes out of the work (in particular studies of compatibility) undertaken by experts from administrations and industries and out of a weighing of the needs of the spectrum's users.

The implementation of most of the ECC's decisions is, especially in France, overseen by the CEPT. Under the Single Market however, this arrangement proved unsatisfactory because the harmonization was voluntary and there was no schedule for its application. In 2002, the "Radio Spectrum Decision" established a procedure leading to a mandatory harmonization of certain bands in EU member states.<sup>2</sup> This decision requires consultations with the CEPT and has provided for setting up the Radio Spectrum Committee (RSCOM) to bring together representatives from member states.

In practice, the European Commission, when it thinks it necessary to harmonize a band, gives, following an opinion from RSCOM, a mandate to the CEPT to work out the technical conditions for this harmonization. The Commission relies on the results of this procedure to draft a decision that includes the technical conditions and deadlines. These conditions may be adopted only if RSCOM gives its approval under the rules for voting set in the Lisbon Treaty. The harmonization decision then becomes mandatory for all member states. Since 2002, this procedure has led to a full harmonization of several frequency bands in the EU, mainly for mobile communications (on the bands to be assigned to operators) and for short-range equipment (including Wi-Fi and the IoT). The ECC's decisions, which are necessarily coherent given the weight carried by EU countries within the CEPT, have facilitated broader harmonization.

On its website, which houses a database on spectrum use in Europe (<https://efis.cept.org/>), the CEPT makes available to public administrations and manufacturers all information on national tables of frequency allocations, licenses in each country and documents about each band. All member states have to provide this information, once again an example of an EU decision made mandatory for its members.

The CEPT is a forum for exchanging experiences about frequency management. It adopts recommendations about the methods for controlling the spectrum and shares information about the interference reported in each country.

## **EU regulations about placing radio equipment on the market**

As in nearly all fields, manufacturers have to follow a "new approach" in order to place radio equipment on the EU market. The Radio Equipment Directive (RED) lays down the main marketing requirements; and standard-setting organizations (in practice, ETSI) adopt harmonized standards for meeting them.<sup>3</sup> Although RED foresees other conformity assessment procedures (via "notified organizations"), the manufacturers of radio equipment nearly always refer to ETSI's standards in their declarations of conformity. All this is obviously related to questions about licenses for using the spectrum.

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<sup>2</sup> Decision 676/2002/CE of 7 March 2002, available at <https://eur-lex.europa.eu/legal-content/EN/LSU/?uri=CELEX:32002D0676>.

<sup>3</sup> Directive 2014/53/EU of the European Parliament and of the Council of 16 April 2014 on the harmonization of the laws of the Member States relating to the making available on the market of radio equipment, available at <https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1601899303875&uri=CELEX:32014L0053>.

RED requires that *“Radio equipment shall be so constructed that it both effectively uses and supports the efficient use of the radio spectrum in order to avoid harmful interference”* (Article 3.2). As a consequence, ETSI’s standards have to be consistent with the technical conditions for using frequencies and, more broadly, with the results of the CEPT’s studies on compatibility. This consistency is obtained through close cooperation between the CEPT and ETSI. Decisions about harmonization and harmonized standards usually develop in parallel, their consistency ensured, during each phase of the drafting process, by exchanges between groups of experts in these two organizations.

Cooperation for overseeing this market also takes place “downstream” between member states. This supervision entails testing equipment on the market to verify whether products meet core requirements and, thus, adhere to harmonized standards. ADCO/RED, an administrative group of cooperation, organizes campaigns in Europe for monitoring the market when a product is suspected of not being in conformity, as recently happened for Wi-Fi 5 GHz equipment that is still interfering with weather radar.

## **A strategic management of radio frequencies in Europe**

As of 2002, the European Commission set up the Radio Spectrum Policy Group (RSPG). This group of high-level experts from each member state is to work out strategic orientations for a spectrum policy. It drafts and adopts, normally by consensus, opinions and reports on topics, such as:

- the European regulatory framework;
- digital dividends;
- bands on the spectrum for mobile networks (including 5G), the Internet of Things (IoT), smart mobility, broadcasting, security services and science;
- sharing of the spectrum, cognitive technology, the relation between regulations about using the spectrum and the marketing of new products;
- the authorization of uses: licenses, the secondary market, collective uses, shared access.

These opinions often provide the grounds for the Commission’s actions in favor of harmonization in Europe (through the CEPT’s mandates or bills of legislation).

In 2012, the European Commission sought to foresee a planning of spectrum management. The European Parliament and Council thus adopted a multiannual Radio Spectrum Policy Program (RSPP). This decision set the general objectives for frequency management and dealt with questions related to the authorization of uses. In particular, it set deadlines for delivering to operators licenses for using several harmonized bandwidths.

Although the RSPP has not been modified, the adoption in 2019 of the European Code of Electronic Communications was an occasion for introducing new objectives for licensing procedures. These objectives have to do with, for example, the authorizations for new 5G bandwidths, the organization of small cells, the EU’s competence for coordinating spectrum uses in border areas, and the peer review of authorization/licensing procedures in harmonized bandwidths. Implementation will rely on the RSPG.

As debates during the drafting of the electronic communications code showed, member states did not want, in matters of licensing, to significantly alter competence between the EU and member states. The latter have to uphold general objectives while maintaining control over licensing procedures and nontechnical conditions (coverage, auctions, etc.). The only example of harmonization justified by the provision of European coverage for the services offered has been, and will remain, the bands 1980-2010 MHz and 2170-2200 MHz. They were the stakes in an EU procedure for selecting operators for mobile satellite telecommunications in 2009 (licenses now held by Inmarsat and Echosat).

## **Coordination in border zones**

Coordination between radio stations located in different countries is mostly bilateral. However the awareness that difficulties along borders could affect the actual availability of radio-frequency bands has stimulated efforts of coordination.

Since 2003, the HCM (“harmonized calculation method”) agreement has foreseen a framework of coordination between seventeen European countries (including France). It concerns fixed and mobile land services on the bandwidth from 29.7 MHz to 43.5 GHz. This coordination focuses on the format for exchanging data, the procedures for reaching agreements, harmonized methods for making calculations, etc.

For its part, the CEPT has adopted recommendations about thresholds of coordination in border areas. It has also proposed “coordination toolboxes” for following up on the ITU’s recommendations on border areas. Coordination between 5G networks on the band 3400-3800 MHz has raised questions about whether it is worthwhile synchronizing networks in border zones.

Some programs of border coordination have led public administrations in Europe and elsewhere to form *ad hoc* groups for drafting multilateral plans (for instance, WEDDIP: Western Europe Digital Dividend Implementation Group). Successive plans have been made for reassigning bands for television services, given the “digital dividend” to be reaped as the evolution of electronic technology frees certain bands, specifically 700-800 MHz, to the benefit of mobile operators.

At the EU level, the RSPG set up, as of 2012, a group for seeing to it that coordination in border zones not be an obstacle to reaping this first digital dividend, namely the 800 MHz band. This group has also addressed the problem of the interference in neighboring countries of transmissions from Italy. This interference stems from licenses granted in the past with no regard for international obligations. The importance of border coordination reappears with regard to the strategic questions about the 700 MHz band in relation to 5G. The new European Code of Electronic Communications has institutionalized the RSPG’s role as mediator and formulated a legal solution: the RSPG’s findings are binding in problematic cases of coordination or interference that affects the use of a harmonized band.

## **Coordinating European interests in the ITU-R**

As a regional organization recognized by the ITU, the CEPT submits to WRCs joint European proposals that respond to each point on the agenda related to modifications of the Radio Regulations (RR). A specific ECC work group hammers out a joint European position in view of the next WRCs. This Conference Preparatory Group (CPG) takes part in the preparatory work that, done within the ITU Radiocommunication Sector (ITU-R), spans the four years between two WRCs. Participation by industry and public administrations in this preparatory work is evidence of the importance of the RR in several sectors: space, transportation by air and sea, science, broadcasting, and mobile communications. The level of coordination is comparable in other regions worldwide.

Apart from the WRCs and preparations for them, the ITU-R sometimes conducts activities related to contributions from the CEPT (*e.g.*, to promote the European regulatory approach and harmonize conditions for using certain bands).

At the EU level, the Council used to issue conclusions that set the EU’s joint policy objectives prior to a WRC. Since WRC-19, its decision still defines the EU’s positions about certain points on the agenda. European treaties make this mandatory when a WRC’s decisions would have an impact on what has already been accomplished in Europe. The Council’s decision is binding on member states for the signature of a set of joint European proposals and for negotiations during WRCs. However these positions are formulated as general objectives and are less definite than the positions hammered out about modifications of the RR.

## **Conclusion: A harmonized use of frequencies in Europe thanks to twenty years of cooperation between the EU, CEPT and ETSI**

The legal framework for harmonizing radio frequencies (the Radio Spectrum Decision) has not changed since 2002 — a point worthy of notice in the European regulatory environment. An equilibrium seems to have been reached between mandatory harmonization at the EU level, the CEPT's voluntary harmonization and the competence fully invested in national decisions. This equilibrium shifts as uses of the spectrum evolve (5G, new short-range devices, land transportation, etc.). Harmonization of the spectrum in the EU is a model for the management of radio frequencies in other countries, in Europe and, too, in Africa, the Near East and even beyond.

The limitations of EU harmonization are still under discussion. Member states who want to take account of national conditions, in particular the actual demand from the marketplace, sometimes ask for more flexibility. Flexibility obviously seems to be a disadvantage when a joint response has to be made to needs related to new uses of the spectrum, uses hampered by national rules and regulations. The lines of force are slowly shifting toward other aspects of harmonization: coordination in border zones (deemed important since the first digital dividend) and authorization/licensing procedures, which are still the preserve of member states.