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RADIO SPECTRUM POLICY GROUP

RSPG Report

**on proposed spectrum coordination approach for broadcasting in the case
of a reallocation of the 700 MHz band**

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1. INTRODUCTION

On 17 February 2012 the World Radiocommunication Conference (WRC-12) decided a new allocation for mobile service in Region 1 in the frequency band 694-790 MHz, to be effective immediately after WRC-15, and approved the Resolution 232 on the “Use of the frequency band 694-790 MHz by the mobile, except aeronautical mobile, service in Region 1 and the related study” and ITU has started the appropriate study in response to this Resolution, including the impact of this new allocation in terms of cross border coordination.

RSPG has been studying since March 2012 the future spectrum demand for wireless broadband which includes the issue of the 700 MHz band amongst other frequency bands suitable for the development of wireless broadband communications.

There is the need to address the new complexity deriving from the consideration given by ITU to the future use of the 700 MHz band by the mobile service, noting that the allocation will be effective only after WRC-2015 and is subject to Resolution 232 (WRC-12), and the need to take account of a new strategic roadmap, for the moment limited to studies and compatibility analyses and assessment of demand. ITU itself recognizes there is a need for countries to assess the consequences of a new allocation of the mobile service below 790 MHz on the equitable access to spectrum in the Geneva 06 (GE06) Plan.

Therefore, this Report examines the best approach which could be considered in spectrum coordination between EU countries, in case of use of the 700 MHz frequency band for wireless broadband communications, and the related timeline. Under ITU terminology, the wireless broadband communications would be able to use the mobile allocation.

2. RECONSTITUTING THE SPECTRUM RIGHTS FOR BROADCASTING BELOW THE 700 MHZ BAND

GE-06 Plan had generally provided to each country the rights enabling the deployment of about six to eight layers for broadcasting (ie, equivalent to 6 to 8 channels available in each area of a country).

Although the concept of layers provides an easy picture of the deployment situation, it has to be used cautiously in the context of equitable access. For example, some countries do not have the same number of programmes/multiplex in each area. Also, the comparison between the number of layers does not provide a full picture of the spectrum rights: the quality of the coverage (e.g. percentage of covered population), the size of the single frequency networks, or the type of reception are elements which are more or less demanding on the frequency resource required for establishing a layer.

Following GE-06, a myriad of bilateral and multilateral discussions had been organized to modify or optimize the results of the Conference to respond to evolving needs:

- In many countries, the simulcast between analogue and digital and the switchover process created specific transitional needs;
- Some countries had more broadcasting requirements than their rights in GE-06, requiring further discussions with their neighbours;
- The decisions and relative timelines made by individual countries in reallocating the 800 MHz.

This last evolution was probably the most difficult to face, taking into account that the reallocation of the 800 MHz had different impacts in various countries depending on their number of GE06 assignment/allotment rights in the band 790-862 MHz and, therefore, the number of affected layers. For countries having other primary services (e.g. for defence applications) already operating in all or part of the 800 MHz band, the impact on broadcasting service was correspondingly reduced.

The result of this intense activity of coordination has shown that the objectives of countries for broadcasting vary considerably. However, it was possible to reconstitute most of the broadcasting rights in order to satisfy the objectives of each country and taking due account of the equitable access principle.

In comparison with the 800 MHz band, if the frequency band 694-790 MHz was reallocated to mobile service, this would be significantly more disruptive for broadcasting service. It would correspond to a loss of 96 MHz from a total of 320 MHz, ie exactly 30 % of the band 470-790 MHz¹.

A simple rule-of-thumb of proportionality would mean approximately the loss of 2 layers in addition to those lost in the 790-862 MHz band. In addition, this reconstitution would have an impact on many spectrum assignments for broadcasting, given that the loss of the 700 MHz band would affect each layer differently. In some countries or part of countries, layers can be affected very badly, ie, 78% loss of spectrum resource in the example given in annex 1. Therefore, the reconstitution would have to ensure equitable access amongst countries and would require significant planning and coordination activities. This process is a significant challenge, which should not be underestimated.

Developing technology, e.g. DVB-T2 with larger SFN networks, would probably help to achieve this challenge but to a limited extent. Even with national SFN networks and in an ideal situation, the 4-colour theorem would limit the number of layers to a theoretical maximum of 1/4th of the available channels (28 channels in the band 470-694 MHz, i.e. a theoretical maximum of 6 layers). And the 4-colours theorem does not apply well in radio communications, where interference propagate much beyond the border (ie, incompatibility

¹ From the original UHF band subject to the GE-06 Plan (470-862 MHz), the loss is 168 MHz, ie 43 % of the original UHF band.

between non-adjacent countries) and where other constraints have to be taken into account (radioastronomy in channel 38, reuse of existing sites ...). Therefore, in practice there is a need of more channels than 4 times the number of layers, which is consistent with the above paragraph.

3. COORDINATION APPROACH

An approach similar to what was used for GE-06, where a Regional Conference would define a new plan for broadcasting, has the merit of providing a clear path for administrations to reconstitute equitable broadcasting rights below the 700 MHz band. However, it has major drawbacks:

- It tends to erase the variety of needs between countries with a risk of not providing an optimal result for each administration, while the reduction of spectrum increases the interest for an optimal allocation of the spectrum resource
- Organizing a conference like GE-06 is a formal, resource intensive, complex and lengthy process. This would be likely to involve all the GE-06 countries with possible unexpected results
- A GE-06 approach could result in a major change of the implemented plan, thus significantly increasing the cost of migration

On the other hands, bilateral cross border coordination can be satisfying in certain circumstances (e.g., UK/Ireland) but does not enable to address complex geographic situation such as around Benelux, Adriatic or in the Central-East European region. Also, it should be recalled that bilateral agreements have to be reached with non-EU countries some of which also have different frequency usage in the 700 MHz band.

An interesting development in the 800 MHz negotiation process was the creation of multilateral cross-border coordination groups, namely the Western European Digital Dividend Implementation Platform (WEDDIP) and the North-East Digital Dividend Implementation Forum (NEDDIF), in order to address complex situations: the difficult compatibility configuration in the area of the Benelux countries and difficulties arising from the compatibility with aeronautical radionavigation systems, respectively.

In the case of a reallocation of the 700 MHz frequency band, the negotiation approach could similarly to the 800 MHz, be based on bilateral/multilateral coordination groups such as WEDDIP with some suggested improvements.

In order to improve such approach for planning and coordination it could be helpful:

1. To strengthen the action of multilateral groups, eg:
 - to encourage the creation of new groups if needed and,
 - to ensure that the discussions in these groups would result in favourable positions amongst concerned Member States for multilateral formal

agreement(s). This would avoid the risk of back and forth discussion between the multilateral level and the bilateral level and,

- to define a realistic deadline, consistent with the implementation objective and taking into consideration the specific coordination challenges in different geographical areas (e.g. with non-EU countries). This would certainly help in reaching stable positions in due time.

2.

3. To monitor and review the overall coordination process by CEPT in order to ensure the consistency between the progress of coordination in all involved countries. This should include a roadmap and technical guidance (e.g. methodology and criteria for interference or for assessing equitable access taking into account practices already developed by some coordination groups for the 800 MHz band) for reaching coordination agreements. Such monitoring/reviewing would avoid a situation where “first-signed” agreement would negatively impact the possibility of compromise in another area or, on the other hand, that a deadlock in an area would prevent the overall progress of negotiation. This monitoring and review should include the case of cross-border coordination with countries not involved in the above process.

4. TIMELINE

4.1 Timeline for cross-border coordination process to reconstitute broadcasting rights below 700 MHz

The cross-border broadcasting coordination activity which relates to the implementation of the 800 MHz band for the mobile service is still continuing for a number of countries in Europe (reconstitution of layers, impact of the various time of implementation...). There are geographical regions where the coordination process for the 800 MHz band has started but where no agreement on the modification of the GE06 Plan has been reached yet and there are bi- and multilateral relations where the coordination process has not really progressed (e.g. in case of some Central-East European countries).

The experience of the 800 MHz band showed that, for countries having completed the cross-border coordination process, about 3 years were necessary. For example, between 2009 and 2012, WEDDIP helped countries to elaborate coherent multilateral discussions and provided basis for bilateral discussions and agreements. However, some coordination cases covered by WEDDIP have yet to be finalized.

In the case of 700 MHz, we could consider on the one hand that the reconstitution of maximum number of layers below 694 MHz, taking into account equitable access to spectrum, will be more complex and on the other hand that practices (e.g. methodology and criteria for interference or for assessing equitable access) developed for the 800 MHz band might be reused. It gives an indication that a period of more than 3 years would be required for reaching the necessary cross border coordination agreements, in particular in geographical areas with many small countries

The start of any overall coordination approach at the EU level relating to the implementation of the 700 MHz band could hardly start before there is a political decision at the EU level on the use of this band.

Also, it has to be noted that the channelling arrangement, the studies on adjacent band compatibilities, and the refinement of the lower frequency edge of the 700 MHz band, which are under discussion in ITU and CEPT in preparation for WRC-15, are likely to have a strong impact on coordination objectives. Therefore, it is reasonable to consider that coordination process on the 700 MHz band could not fully start before WRC-15, given the possible implication of this conference on elements such as the lower limit of the 700 MHz band. This should not prevent preliminary coordination activities in advance, taking into account uncertainty on the WRC-15 final results, in order to avoid undesired delay.

In addition, one key element for helping such a coordination approach would be to have a clear timeline for the negotiation: date for starting the negotiation and date for reaching agreements.

Also, it should be noted that:

- there is a possibility of assistance to Member States, under the RSPP article 10.2, to resolve spectrum coordination issues with countries neighbouring the Union and,
- there is a process for RSPG good offices to help coordination between EU countries.

4.2 Cross border coordination between mobile and broadcasting in the 700 MHz band

The impact of a desynchronization of any implementation of mobile service in the 700 MHz band amongst various countries on the timeline is also to be considered. The interference from broadcasting stations into the base stations of the mobile service can reach few hundreds of kilometres and the interference from base station to broadcasting reception at the border can also be significant. Although the GE-06 agreement includes the procedure for determining where coordination is required, the practical coordination may be difficult and severely reduce the overall spectrum efficiency. This was one of the reasons for European widespread availability of the 800 MHz for mobile service. Therefore, cross-border coordination issues between mobile and broadcasting have to be taken into account by Member states when determining the timeline for the introduction of mobile service in the 700 MHz band together with other elements such as national situations and coordination challenges.

4.3 Other elements relating to the timeline

There are other elements relevant to the definition of the appropriate timeline for the 700 MHz band:

- duration of broadcasting licences
- development of broadcasting services

- transition to other technologies (ie, DVB-T2, HEVC)

These elements are discussed in details in the draft RSPG opinion on future demand for spectrum for wireless broadband.

5. CONCLUSION

Having reviewed the impact of a potential reallocation of the 700 MHz band to mobile service on cross-border coordination for broadcasting, the RSPG has reached the following conclusions:

1. The reallocation of the band 694-790 MHz to the mobile service, if decided, will be significantly disruptive to broadcasting service, with 30% less spectrum available compared to the situation after the loss of the 800 MHz band. Each layer, each part of country, and each country will be affected in a different way. Therefore, there would be a need for each country to reconstitute consistent rights below 694 MHz based on the equitable access principle. This challenge should not be underestimated.
2. The application of the equitable access principle has to take into account the various needs of each country and elements such as the quality of the coverage, the extent of use of the single frequency networks, and/or the type of reception.
3. In the case of a reallocation of the 700 MHz frequency band, the negotiation approach should preferably, similarly to the 800 MHz, be based on bilateral and multilateral coordination with coordination groups such as WEDDIP, with some suggested improvements.
4. In order to improve such approach, the action of multilateral groups could be strengthened so as to:
 - encourage the creation of new groups if needed and,
 - ensure that the discussions in these groups would result in multilateral formal agreement(s) and,
 - define a realistic deadline, consistent with the implementation objective, to conclude the work.
5. The overall coordination process would need to be monitored and reviewed by CEPT in order to ensure the consistency between the progress of coordination in all involved countries. This should include a roadmap for reaching coordination agreements.
6. It is expected that a period of more than 3 years would be required for reaching the cross border coordination agreements necessary to reconstitute equitable broadcasting rights below the 700 MHz band in particular in geographical areas with many small countries. Although it does not prevent some preliminary coordination activities, the

essential part of such process cannot be carried out before EU political decision and before WRC-15 has decided about the 700 MHz band allocation.

7. Any decision for timeline for the introduction of mobile service in the 700 MHz band, by Member state or at EU level, should take into account the cross-border interference issues between mobile networks (low power, low tower networks) and broadcasting networks (high-power high-tower), together with other elements such as national situations and coordination challenges.

ANNEX 1

Impact of a second digital dividend on the layers obtained at the RRC-06

Example of the French-speaking community in Belgium: 78% of the rights affected by the reallocation of the 700 MHz band

