Comments on
Draft RSPG Report on "Cognitive Technologies (Final Draft - 14 October 2009)"

18 December 2009

I Introduction

ARD and ZDF welcome the opportunity to comment on the Draft RSPG Report on "Cognitive Technologies" (of 14 October 2009). ARD and ZDF are the Public Service Broadcasters in Germany using extensively the broadcasting bands for the terrestrial distribution of their programmes.

ARD and ZDF support the activities of the RSPG to provide an overview of the technical and regulatory aspects of Cognitive Radio (CR) technologies. We agree with the report that CR technologies may provide key elements of innovation, "resulting in a significant increase of overall spectrum efficiency". Since spectrum scarcity is still a major problem in spectrum management innovative technologies are of great importance.

As broadcasters we focus our comments on the possible application of CR technologies for broadcasting purposes and on the possible introduction of services using CR technologies in the broadcasting bands.

II Possible CR applications for broadcasting

Broadcasters use the UHF spectrum not only for delivery of terrestrial television but also use the interleaved UHF spectrum for radio applications of their production services. These PMSE services are of high importance for the production of broadcast content and have high requirements with regard to quality of service. Already at present spectrum resources for these services are not sufficient in areas with particularly high DTT usage and/or in cases of major events like Olympics.

It is our expectation that future PMSE devices applying CR technologies will provide means for a more efficient spectrum usage and thus help to alleviate this shortage.

III Premature status of CR technologies

However, even if CR technologies are expected to provide innovative means of spectrum usage we agree with the report that "many aspects of CR technologies, including the business models, are still unclear". We have the view that there are still a lot of investigations required to determine proper conditions for a reliable operation of services based on CR technologies and that time is premature to take any regulatory decisions on their operation.

German public broadcasters support and actively participate in the initiatives of ETSI and CEPT to clarify and determine the technical requirements of CR technologies.

IV Identification of frequency bands and harmonised approach

We agree with the conclusion of the report that "there are significant benefits in adopting a harmonised approach" for the introduction of CR technologies, and that success can "be achieved if common tech-

nical conditions can be agreed at the European level on identified frequency bands, which provide sufficient certainty and stability to industry within an appropriate timeframe".

However, we do not see why this general and correct conclusion should be restricted to the broadcasting UHF band as is proposed by the report. We are of the opinion that all frequency bands should be treated equally with regard to the assessment of their appropriateness for the introduction and the deployment of CR systems.

V Start band for CR introduction

The report concludes that "it might be useful to start with the introduction of CR in a limited frequency range in which the range of technologies used by the other users in the band is limited, e.g., within the UHF broadcasting bands". Although being a correct reasoning in general this conclusion applies only to a limited extent to the UHF broadcasting band.

In Europe there are several broadcast distribution technologies in operation in this band on a primary basis, as for example DVB-T, DVB-T2 and DVB-H. In addition, a large amount of PMSE services are in operation in this band on a secondary basis applying a variety of different radio technologies. The protection of all these services employing such a variety of different technologies would impose severe requirements on the applied technology of CR systems if introduced in the UHF band. Therefore, other bands where only one technology is applied by other users in the band seem to be more appropriate for the introduction.

VI UHF band

- Vertical Sharing

Regarding the UHF band, we agree with the report that CR systems to be introduced in this band should work under a "vertical sharing" regime, i.e., only an opportunistic spectrum access is allowed for them and without affecting the existing users. In the UHF band these are terrestrial broadcasting and PMSE services.

- Protection of existing services

We agree with the report that "the concept of ‘unused spectrum’ should be managed carefully taking into consideration the relevant radio spectrum usage of a given frequency band. Assessment of the availability of ‘unused spectrum’ needs to take into account the various spectrum usages in a given band, particularly when receive-only or passive equipment is using the band". The latter is the case for DTT receivers which therefore are particularly vulnerable to CR interference.

We furthermore support the view of the report that "receiver parameters have to be known in order to be able to protect existing users". In Germany there are already about 20 million DVB-T receivers in the market. In order to protect these receivers, representative parameters should be based on the characteristics of these receivers.

For DTT in Germany, three reception scenarios are relevant. ARD and ZDF have realized nearly full area coverage for fixed roof-top reception. Mobile and portable outdoor reception of DTT is possible for large parts of the country, and all metropolitan areas are served with portable indoor reception. Therefore it is important for ARD and ZDF that all three reception modes are protected.

Portable and mobile reception will additionally suffer from different interference mechanisms than fixed reception. This relates in particular to interference from CR terminals. We therefore propose to include the necessity of a full assessment of the protection criteria for all DTT reception modes in the conclusions of the report.

Results of measurements in the context of the assessment of compatibility criteria between mobile services in the 800 MHz band and DVB-T suggest that these protection criteria may impose severe restrictions on CR operation.

A similar case is encountered for TV cable reception. CR devices, being operated in the tuning range of TV cable receivers, are likely to interfere with these receivers in many cases. Also here, interference measurements suggest that severe restrictions would have to be imposed on CR operation in order to protect TV cable reception.

- Future developments

Beyond the protection of the present implementations of the incumbent systems, also their future developments with regard to technology and operation have to be protected by CR systems operating in the same band. This is a demanding feature for CR systems, nonetheless necessary in order not to impose undue restrictions to the primary and secondary services in the same band. This aspect is not found in the conclusions of the report and should be included.

VII Avoid premature decisions

In any case it should be avoided to take decisions on the introduction of CR systems at a stage where compatibility issues are still unclear, i.e. before the full technical and operational requirements for CR systems are determined which allow for a reliable protection of the existing services in the bands where the CR systems are to be introduced. This is a lesson learned from the premature decisions taken in the past on the requirements needed for the introduction of mobile services in the 800 MHz band with regard to compatibility with digital terrestrial broadcasting

In the case of the UHF band these services are the existing DTT services (DVB-T, etc.) and the PMSE services operated in this band.

This aspect should be included in the conclusions of the report.