

## ETNO Reflection Document on draft RSPG report on Cognitive Technologies



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### Executive Summary

ETNO members have very large investments in existing radio infrastructure and licences to provide reliable high quality services to consumers.

Studies performed so far have demonstrated that Cognitive Radio Technologies (CRT), although look promising for certain applications, do need further developments before being put in place.

ETNO therefore believes that the introduction of CRT should only happen when the detection of primary users has been demonstrated to be efficient, and their application should focus on “under-used” frequency bands.

## Introduction

ETNO is looking with interest at the possibilities offered by Cognitive Radio (CR) and Software Defined Radio and therefore welcomes the Radio Spectrum Policy Group invitation to express comments and views in relation to the draft RSPG Report on Cognitive Technologies.

ETNO considers that CR is potentially both an opportunity and a threat, and therefore welcomes this detailed study, which considers the various aspects of the subject.

## ETNO view

As network operators, ETNO members have made very large investments in existing radio infrastructure and licences to provide reliable high quality services to consumers.

ETNO agrees that, although the Cognitive Technologies are embryonic and look promising for certain applications, they do need substantial further developments before being put in place.

ETNO is therefore very concerned to ensure that the performance of the existing networks is not compromised by uncontrolled or poorly defined operation of CRT devices. It is essential that CRT devices are not allowed to operate in licensed bands used by existing networks and infrastructures, unless there has been careful demonstration of satisfactory co-existence by CEPT (undertaking sharing studies) and ETSI (producing appropriate Harmonised Standards in accordance with the R&TTE Directive) in close co-operation with existing licence holders.

Moreover, ETNO finds:

- That the application of CRT causes many concerns in many areas as they imply the definition of “unused” spectrum, and this creates difficulties with passive services.
- They also imply the perfect knowledge of receivers’ parameters, and these are different in different frequency bands and for different applications.
- Furthermore the “intelligence” of the CRT devices has to vary in function of the scenario in which they have to operate, which will not be easy to achieve.
- Finally it should be noted that Article 7.5 of the R & TTE Directive requires that operators take immediate countermeasures in case of device malfunction, while for CRT and SRD such malfunctions could be out of operator’s control and therefore difficult, if not impossible, to be solved by the operator.

ETNO believes that the examples cited in the Report do need further deep consideration: the 5 GHz RLAN band, where pre-cognitive solutions have been implemented, is still creating concerns with some members of the Radiolocation community. The other example, the TV White Spaces, is still under investigation within CEPT SE 43 and, from preliminary studies presented there, the following results have been found:

- The spectrum sensing approach is not a reliable one, if used alone, to ensure that white space devices will not interfere with other services.
- Furthermore other approaches such as beacon and pilot channel proposed for CRT are not fully satisfactory.
- The beacon approach raises some concerns mainly related to the cost to provide coverage where broadcast networks do not, while pilot channel can present some issues in relation to its spectrum requirements.
- The geolocation database approach presents the criticalities of having a reliably location method (GPS is not available indoor) and keep an up to date database.

Studies in SE 43 show indeed, that CRT present a high potential threat to degrade the quality of service of other networks operating in the same band, if not regulated properly.

These examples demonstrate that it is still too early to put in place concrete applications of a concept that would work, for the time being, only in ideal scenarios. ETNO therefore believes that the introduction of CRT should only be investigated “in concreto” when such technologies are mature.

Moreover, as stated in the report, it is to be expected that with a growing use of CR, re-farming will become more difficult and therefore may restrict operators to exploit “their” licensed spectrum as they wish.

On a more positive note, ETNO recognises that CRT may also provide opportunities for network operators. As an example, the possibility for licence holders to trade or lease the rights of use for spectrum might bring additional flexibility to spectrum management. Although as network operators we have, in most cases already maximised the commercial use of our licensed frequencies, temporary use of under-used frequency bands would help to cope with peaks of traffic at rush hours. This is an aspect which we shall be interested to follow, to determine whether any significant consumer products are developed to take advantage of this opportunity.