

PROGRESS REPORT TO RSPG#14 ON 22 NOVEMBER 2007

REQUEST BY THE EUROPEAN COMMISSION
TO THE RADIO SPECTRUM POLICY GROUP
FOR AN OPINION
ON

ASPECTS OF A EUROPEAN APPROACH TO 'COLLECTIVE USE OF SPECTRUM'

A first meeting of the RSPG Working Group on Collective Use of Spectrum (CUS) was held in London on 19 October 2007. This followed adoption of the Request for Opinion (RfO) at the previous RSPG in May 2007: the tasks contained in the RfO are included at Annex A.

The list of representatives that attended this first meeting is shown at Annex B along with others that have expressed an interest in participating in this work but were unable to attend this first meeting. If any other RSPG members wish to participate in the future work of this Working Group please inform the Rapporteur (Chris Woolford).

This first Working Group meeting focused on the following issues:

- agreeing a common definition of CUS and clarifying terminology in a common glossary (Task 1 of the RfO);
- considering how CUS can be used in conjunction with other spectrum management models. This included discussion of both the interaction with other spectrum management models (such as WAPECS or administrative assignment) as well as different ways of implementing CUS (part of Task 2);
- Scoping the remainder of the work (Tasks 3-6).

i. Definition of CUS

Following lengthy discussion the WG agreed the following definition of CUS:

“Collective Use of Spectrum allows an undetermined number of independent users and/or devices to access spectrum in the same range of frequencies at the same time and in a particular geographic area under a well-defined set of conditions.”

This is slightly different from the definition proposed in the *Study on Legal, Economic & Technical Aspects of “Collective Use” of Spectrum in the European Community* undertaken for the European Commission in November 2006 by Mott MacDonald. In particular, the Mott MacDonald study proposed CUS as allowing “more than one user” whereas the Working Group definition talks about an “undetermined number of independent users and/or devices”.

The RfO explains that the definition of CUS is one of the main issues which should be agreed at the RSPG on 22 November. **The Working Group would therefore welcome**

views from the RSPG on the above proposed definition and, if possible, confirmation that it should be used as the basis for further work of the Group.

In forming this view, it should be noted that the above is intended to be a high level definition of CUS. There are some important points, not covered by the above definition, that are relevant to the understanding of CUS and which consequently need to be further explored in the development of this Opinion.

These include:

- who is responsible for co-ordination? Under individual authorisations co-ordination is dealt with through licences which are the responsibility of the Spectrum Management Authority whereas under general authorisations the user is more responsible for co-ordination (within certain pre-determined parameters). The Working Group felt that this issue of responsibility needed to be better understood.
- Related to the above is the issue of how CUS fits within the authorisation regime. CUS is clearly more associated with general authorisations, but the Group noted there may also be some overlap with individual authorisations. This was felt to be particularly relevant in relation to ‘light licensing regimes’ where, for example, there may be a need to co-ordinate with an incumbent user; or ‘private commons’ where an individual (and licensed) user sets the conditions for licence-exempt access
- A better understanding of the different spectrum management approaches (‘spectrum commons’, ‘light licensing’, etc) that are included within the scope of CUS. As implied above, this is difficult as some may be partly inside and partly outside the scope.

Some of these points have started to be addressed in the next section. However, further work is required and these issues will therefore continue to be addressed further at future Working Group meetings.

ii. CUS and alternative models of spectrum management

Under the European Regulatory Framework, a distinction is made between two different models of spectrum authorisations: individual authorisations and general authorisations. Individual authorisations are usually associated with both administrative and market based approaches to spectrum management while general authorisations are associated with the CUS model.

Beyond the palette of various spectrum management & regulatory approaches that can be envisaged, it is essential to emphasize as a prerequisite that the licence-exempt model differs from administrative assignments and market mechanisms which assign a certain frequency band to an individual user and guarantee the protection of radio stations operated by such a “primary” user (e.g. governmental users, “safety of life” services, TV broadcasters, telecom operators...).

Regulatory approaches under the licence-exempt model mainly fall under the “general authorisation” umbrella while the two other models are associated with the principle of “individual authorisation”. While the overall objective behind frequency management should be the same – i.e. to promote an efficient use of the spectrum – **these three general approaches basically reflect different constraints and obligations associated with the specificity of respective end users and are in this sense complementary to each other.**

In order to understand what is covered by the CUS model, it is important to consider the advantages and disadvantages of CUS and other spectrum management models, how it can be implemented in the same frequency bands as the Individual Authorisation (IA) model, what is encompassed by this CUS umbrella term and what is in the grey zone between CUS and other spectrum management models.

The attached graphic (see the slide in annex C) seeks to identify some of the different approaches that can be considered within the CUS model. It also seeks to explain how these approaches fit within the 3 models of spectrum management and in turn within the European Regulatory Framework for electronic communications. It shows how the level of protection increases as one moves from general to individual authorisation and also explains how different types of spectrum fee may be applied.

It should be noted that this graphic is still work in progress, not least in terms of the relationships between the licensing regime and the management approaches. However, it is included here to give an indication of the direction of thinking of the Working Group.

iii. Scope of CUS

Although there is a strong correlation between licence exemption and CUS, the two are not the same. In general, the Working Group felt that CUS was slightly wider than licence-exemption as certain types of individual authorisation could, under specific circumstances, be considered CUS.

There was also discussion of the various types of spectrum management approach that either fully fall within the scope of CUS or which could, under certain circumstances, be considered CUS. These include:

Spectrum commons

It was noted that there is no single definition of spectrum commons and different definitions are already in use in Europe and the US. The main differences between the definitions is that in some countries, such as the UK and US, spectrum commons is only considered to cover generic applications where there are no constraints on the types of application that can be deployed (just generic conditions for licence exemption); whereas in some other countries spectrum commons is additionally considered to include to licence-exempt use for specific types of application.

The Group discussed this issue but concluded that different understanding of spectrum commons did not present a problem. This was because both the narrow interpretation (generic allocations only) and the wider interpretation (generic and specific allocations) could both be considered CUS.

Private Commons

Under a private commons model, an individual right of use is required but access to spectrum may be “sub-let” to third parties on a licence-exempt basis without the need for co-ordination, so long as pre-defined regulatory conditions are adhered to. Responsibility for avoiding interference with users outside the spectrum band rests with the right of use holder.

It was noted that not all types of private commons could be considered CUS. This is because the conditions of access to the band are set by the licence holder and the licence holder can, for example, specifically limit the number of users that have access to the band on a licence-exempt basis, meaning that the number of users may not be “undetermined” as set out in the definition of CUS. However, in other cases, the licence holder may choose to open the band more generally to any number of licence-exempt users: in such cases this would seem to fall within the scope of CUS.

It is interesting to note that “private commons” is also associated with a market based approach to spectrum management as it is most probable that the licence holder will have obtained their rights of use through a competitive process. Given that CUS may also overlap with some approaches based on administrative assignments, it can be concluded that CUS potentially cuts across all three approaches to spectrum management: licence-exemption, administrative assignments and market mechanisms.

Light licensing

The Group discussed approaches based around light licensing. As with private commons, it was felt that there were definitely light licensing models that fell within the scope of CUS. For example in Ireland there is a simple registration scheme in use in the 5.8 GHz band in order that the Spectrum Management Authority knows who is using the band in case of any future European regulation of which users would need to be informed. This is CUS as there is no restriction or limit to the number of users in the band. However, it was also felt that there may be light licensing models that fell outside the scope of CUS, for example, if registration was designed to limit the number of users in the band.

In order to better understand the various approaches to light licensing and the fit with CUS, it was agreed that the WG should try to gather further information on the various light licensing regimes in place across Europe. Such light licensing regimes may be based around:

- notification
- registration
- co-ordination with incumbent users
- etc.

One further point, raised at the Working Group, concerned how spectrum trading may fit within a light-licensing model and whether this would imply being outside the scope of CUS. Again, any further information Member States could provide about existing light-licensing regimes which may inform this discussion would be very welcome.

RSPG members are therefore requested to provide brief details of light licensing regimes in place in Member States to Chris.Woolford@Ofcom.org.uk by 12 January 2007.

It was noted that similar work is currently being undertaken by WGRA, for example in relation to trying to better understand light licensing regimes across Member States. However, there is already some overlap in the membership of both groups which should facilitate effective co-ordination and sharing of information between the Groups and avoid unnecessary overlap.

Overlay and underlay technologies

There was relatively little discussion of overlay (such as cognitive access) and underlay (UWB) technologies at this first meeting. However, it was recognised that this is something that will need to be addressed at future meetings as both may be relevant to CUS.

iv. Future work of the Group

The next meeting of the Working Group has been arranged for 22 January. This will focus on Tasks 3-6 as set out in the RfO, including:

- the expected impact of technological, societal and economic developments;
- assessing the societal and economic value of alternative spectrum management approaches;
- assessing the innovation potential of the CUS model and understanding the implications of CUS for regulation.

To facilitate these discussions, a more detailed list of issues has been prepared. However, this is still at a provisional stage and has not yet been discussed in any detail by the Working Group so is not included within this report to RSPG.

The Working Group would welcome any feedback from RSPG on this report of the first meeting and any views concerning further work.

Chris Woolford

Rapporteur

November 2007

ANNEX A

TASKS TO BE PERFORMED AND ISSUES TO BE ADDRESSED IN THE OPINION (AS SET OUT IN THE REQUEST FOR OPINION)

- (1) **Develops a common definition** of Collective Use of Spectrum as a generic spectrum management model, and **clarifies the relevant terminology** in a common glossary (e.g. terms like “light licensing”, “exclusive use”, “shared use” among others).
- (2) **Reflects on the benefits of the Collective Use of Spectrum model at EU level**, and explores the possibilities and limitations for combining this model with other spectrum management models to achieve synergies in order to maximise spectrum efficiency and to improve interference management in Europe. The following questions could be addressed when reflecting on this aspect:
 - What criteria could be used to determine when to use this management model and in what ways can this model be combined with other management models (what are the possibilities to regulate the same bands with different management models)?
 - How can the various ways to implement collective use (generic allocations, application specific allocations, underlay, overlay, light licensing, private commons, politeness protocols, etc) be integrated in a strategic approach?
- (3) **Assesses the impact of expected technological, societal and economical developments** on the need to manage spectrum under a ‘Collective Use’ model and identifies subsequent policy-related challenges and issues to be addressed. Among others, the following question could be addressed when assessing this aspect:
 - To what extent do these developments suggest a wider recourse to the CUS approach?
 - What is the anticipated trend? (relevant technological trends, their maturity over time and their costs)
 - Beyond short range devices, are there other radio applications which could be envisaged to be covered by this CUS model?
- (4) **Explores ways to compare the societal and economical value of alternative spectrum management approaches**. The following question could be explored when reflecting on this aspect:
 - How can the value or benefits of technologies that depend on the CUS model be compared with those of technologies that depend on exclusive usage rights?
- (5) **Assesses the implications of increased usage of the CUS model for spectrum regulation in Europe**. Relying more on spectrum users to manage interference will change the current division of responsibilities between spectrum regulators and spectrum users, how can such a shift best be addressed? The following questions could be addressed when assessing this aspect:

- Consider the added value of EU-wide harmonisation of usage conditions as the default when allocating spectrum for collective use spectrum in the EU. What would this mean for the current institutional spectrum management environment?
 - Consider the need for and consequences of a global harmonisation of collective use spectrum?
 - Consider possible changes in the role of the spectrum regulator as a result of increased use of the CUS model in Europe.
- (6) **Reflects on the ‘innovation potential’ the CUS model offers.** How can this model best be applied in order to contribute to the development and adoption of wireless techniques and assist in advancing the objectives of the i2010 strategy?

Members of the Working Group

Attendees at 19 October 2007 meeting

Chris Woolford (Rapporteur)
Jean-Yves Montfort (France)
Emmanuel Faussurier (France)
Jim Connolly (Ireland)
Erik Moll (European Commission)
Per Andersson (Sweden)
Fokko Bos (Netherlands)
Georges de Brito (ETSI)
Klaus-Udo Marwinski (Germany)
Guido Goeddel (Germany)
Anne Kemmler (Germany)
Reza Karimi (UK)
Andrew Gowans (UK)
Philippe Horisberger (Switzerland/Liechtenstein)

Other RSPG members that have expressed an interest in this work but were unable to attend the first meeting.

Stelios Himonas (Cyprus)
John Breen (Ireland)
Margit Huhtala (Finland)
Luisa Mendes (Portugal)
Franz Ziegelwanger (Austria)

Place of CUS in models of spectrum management

