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**COMMUNICATION FROM THE COMMISSION TO THE COUNCIL, THE
EUROPEAN PARLIAMENT AND THE EUROPEAN ECONOMIC AND SOCIAL
COMMITTEE AND THE COMMITTEE OF THE REGIONS**

A market-based approach to spectrum management in the European Union.

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A market-based approach to spectrum management in the European Union.

(Text with EEA relevance)

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1. SUMMARY

Modern society's dependence on advanced electronic communications contributes to an ever-increasing demand for radio frequencies. From mobile telephony to wireless internet access to TV broadcasting, spectrum is an essential part of our daily lives. The **traditional approach** to solving competing demands for frequencies is based on planning who has the right to use the spectrum and how, trying to facilitate a broad range of policy objectives.

Today, the rapid development of technology and the convergence of telecommunications, media content and electronic devices are creating a dynamic environment where spectrum is becoming an ever more important resource. Spectrum management has not kept pace with these developments, giving rise to an increasing risk that, without change, the traditional approach will prevent society from reaping the benefits of this new dynamic environment. From having led the world in the development of mobile communications, **Europe is now at risk of turning into a user of technology developed elsewhere, rather than being an innovator**. For this reason, Member States are reviewing their spectrum policy. One response is to use a **market-based model** allowing more freedom to market players to decide how spectrum should be used, and lowering the barriers for access to spectrum rights by making possible the trading of the rights.

There is also a risk that the mismatch between regulation and market dynamism in converged wireless communication services will prevent efficient use of spectrum and thereby hinder the achievement of EU policy objectives such as the development of the internal market, competition, innovation and growth. **A fragmented approach to spectrum reform will make it more difficult to reach these objectives**. It is against this background, and following a wide public debate and consultation, that the Commission proposes the coordinated introduction of spectrum markets across the EU.

This proposal is an enabler for growth and jobs and a concrete application of the aims of the revised Lisbon agenda. It is also part of a strategy for an efficient spectrum management as envisaged in the i2010 initiative, anchored in a vision of a **common and coordinated removal of restrictions** on spectrum use in all Member States in order to promote an **open and competitive digital economy**. Europe's citizens should directly benefit through faster access to new technology and lower prices for communications.

Substantial amounts of spectrum, including for instance roughly one third of the spectrum below 3 GHz (the spectrum best suited for terrestrial communications), could possibly be made subject to tradability and flexible use by 2010. This Communication sets a framework for a dynamic and responsive use of spectrum.

Next to the market-based approach to spectrum, the traditional model will continue to have a role to play where important public interests are at stake (e. g defence and aviation, or research services such as radio astronomy and earth observation satellites). Another approach is the **unlicensed model**, which provides additional flexibility by allowing for free access under some technical limitations. Each management model is a useful tool, and developing the right mix between them will be important for achieving EU policy objectives¹.

¹ The Communication COM(2005) 411: "A forward-looking Radio Spectrum Policy for the European Union: 2nd annual report" presents the Commissions overall approach to this subject.

To start this process in a coordinated manner in the EU, the Commission proposes to establish spectrum markets and seeks agreement at political level for the following objectives:

In the period up to 2010, to put into practice at EU level:

- The right to trade individual rights to use frequencies in a selection of spectrum bands for terrestrial electronic communications services
- The right to use these frequencies in a flexible manner.

The Commission intends to propose the regulatory measures necessary to realise this target in the course of the review of the regulatory framework for the electronic communication services, which will start in mid 2006. In parallel, **in order to facilitate** the early development of spectrum markets, the Commission will initiate **a coordination process** with the objective of avoiding delays and costly fragmentation to the detriment of the single market in the time leading up to an EU-wide solution.

2. EFFICIENT USE OF SPECTRUM – THE NEED FOR CHANGE

All radio-based devices use the radio spectrum to transmit or receive information, and with the growth of applications that use the spectrum this has led to an increasing demand that is difficult to serve within the current inflexible management regulations. Spectrum is perceived as a scarce resource. Spectrum availability is critical, not only for mobile telephony, media distribution and wireless internet access, but for many other applications, e.g. weather forecasting, astronomy, and air and maritime safety. It is also essential for services of critical public interest such as security and defence, as well as for everyday devices such as remote controls and hearing aids. The demand for radio spectrum has increased dramatically.

The traditional model of spectrum distribution has been carried out on the basis of assignment of **individual spectrum rights** and allocation of the various bands to defined service categories with avoidance of interference being the primary objective. The size of the spectrum slots and the usage conditions often limit users to specific technologies, for example GSM for some of the “mobile” bands or television for part of “broadcasting” bands. Therefore, individual rights **implicitly or explicitly prohibit use of other technologies or provision of other services**.

This approach no longer seems appropriate for electronic communication services in a world of accelerating technical development, where **compartmentalisation of services becomes increasingly difficult in the light of their convergence**. Digitisation means that a technology can deliver a combination of communication services, such as TV, telephony and broadband access. Furthermore, technical development is making it less costly to enable devices to operate at various frequencies. The traditional model is not agile or responsive enough to enable society to reap the benefits of these developments. This leads to missed opportunities in terms of competitiveness, industrial development and jobs, innovation and choice of services for citizens.

Today, many parts of the spectrum are poorly utilised. The low frequency parts of the spectrum continue to be occupied by older, less efficient technologies while **new technologies can only get access to higher frequencies with limited propagation and higher roll-out costs**.

Policy context

In the European Commission's view the efficiency of spectrum management can be significantly improved. The Commission has highlighted reform of spectrum management as one of the strategic issues in the i2010 initiative launched in June 2005. It has also responded to this issue with a number of other initiatives, including a major study on spectrum trading², public consultations, workshops and the facilitation of discussions at a high political level.

In November 2004, and following a request by the Commission for advice, the Radio Spectrum Policy Group (RSPG)³ in its Opinion on Radio Spectrum Trading concluded that *"spectrum trading could be beneficial in certain parts of the spectrum, provided that sufficient safeguards are implemented"* and *"that there is a need for some commonality of approach to trading among Member States."* The RSPG also noted that *"it could be beneficial to define these (licensing) conditions of use as broadly as possible, with a view to ensuring technological neutrality and flexibility in future use of the spectrum"*.

A consultancy report⁴ submitted in September 2004 by the Dutch Presidency to the Council proposed *"to move to a new and flexible model of spectrum allocation: the EU urgently needs to make its rigid spectrum allocation model flexible"*. The Council concluded in December 2004 that one should *"continue assessing different spectrum management models with a view to a more flexible and efficient use of spectrum at European and global level, taking into account the development of new and innovative technologies as well as the methodologies which make use of market mechanisms."*⁵

3. HOW WILL SPECTRUM MARKETS IMPROVE EFFICIENCY?

Allowing markets to decide the utilisation and distribution of spectrum for converged communication services can be expected to substantially improve the efficient use of spectrum — a key policy objective in the regulatory framework for electronic communications. Efficient use is also central to other EU policy objectives, especially innovation and growth, and has an indirect impact on the functioning of the single market.

Gains

Research indicates that using a market-based approach would have significant economic benefits and would greatly improve citizens' choice and access to new technologies and services at low prices.

The study carried out for the Commission on spectrum trading estimated that for the EU and the EEA Member States **the net gain resulting from the introduction of spectrum trading combined with flexible usage rights would amount to €8-9 billion per year**. Increased innovation was identified as the strongest factor yielding benefits, followed by increased competition. The benefit of a combination of **tradability** and **flexibility** of usage was

² Study "Conditions and options in introducing secondary trading of radio spectrum in the European Community",

http://europa.eu.int/information_society/policy/radio_spectrum/ref_info/studies/index_en.htm

³ <http://rspg.groups.eu.int>

⁴ "Rethinking the European ICT agenda: Ten ICT breakthroughs for reaching Lisbon goals"

⁵ Council Resolution of 10.12.2004, see 15472/04 (presse 345)

estimated to be 10 times higher than if trading of spectrum without flexibility was adopted. Another study⁶ claims that spectrum reforms in the US would give consumers an annual welfare gain of as much as \$77 billion as a result of lower prices for mobile voice services. Although these quantitative results should be viewed as indications of the order of magnitude only, they clearly point to the need for action at European level.

A balanced approach

Experience from the implementation of the various approaches to managing spectrum will reveal the strengths and weaknesses of each of the alternative models and will help identify where and in which bands each one is best applied. There is now a need to assist the development of spectrum markets in the EU to avoid fragmentation of the conditions governing these markets as they develop.

4. THE EU DIMENSION OF SPECTRUM MARKETS

The radio spectrum is managed mainly by Member States at the national level and in international coordination. Due to a growing awareness of the impact that individual decisions may have on Community policies, some regulatory measures for coordination and improved efficiency have already been put into place at EU level⁷. The regulatory framework⁸ recognises market-based spectrum management as an option and allows for spectrum trading to be introduced by Member States subject to certain conditions⁹.

Increasing the efficient use of spectrum has also been the primary reason why a number of countries inside and outside the EU have either implemented market-based reforms or are in the early phase of the transition to such reforms¹⁰.

A common way forward

Harmonisation of spectrum usage at EU level has been successfully implemented in some spectrum bands to ensure the rapid implementation of new technologies and to reap the benefits of economies of scale. However, most frequencies are not coordinated at EU level and diverging Member State policies continue to limit the development of the internal market.

Introducing spectrum markets in a coordinated fashion in the EU can reduce such problems and also enable de facto harmonisation of usage in a more efficient manner. The study for the Commission analysed the spill-over effect of divergent policies on the introduction of trading and flexibility. **It found that if one country decided not to reform its spectrum management policy by adopting such measures, this would create costs for others, but when one country decided to join the reform project, this would yield an additional benefit to the others.** 60-70% of the benefits would be attributable to national reforms, while 30-40% would accrue as a result of making the transition in all the EU countries. The

⁶ “The economic costs of spectrum misallocation”, Jerry Ellig, May 2005, <http://cadep.ufm.edu.gt/telecom/ingles/interior.asp?menu=lecturas>

⁷ Radio Spectrum Decision 676/2002/EC

⁸ Framework Directive 2002/21/EC, Authorisation Directive 2002/20/EC

⁹ Regulation of radio spectrum is also an important means contributing to the internal market in equipment in conjunction with the RTTE Directive, 1999/5/EC

¹⁰ Within the EU, these are DK, IT, NL, HU, AT, PT, SK, SI, SE and UK.

qualitative reasoning underlying these calculation models assumes the same type of spill-over effect that the EU has experienced with the internal market.

Introducing spectrum tradability at EU level would bring about the conditions for seamless cross-border services on the basis of rules applied throughout the Community and create one of the world's largest markets in spectrum-supported services. It would rapidly improve the competitive position of the EU and deliver a strong impetus to innovation.

5. KEY ISSUES TO CONSIDER FOR THE INTRODUCTION OF EUROPEAN SPECTRUM MARKETS

There are certain challenges that need to be addressed when introducing spectrum markets and these can only be tackled on the basis of an EU-wide agreement on the policy objectives and by focusing on some key implementation aspects.

5.1. Agreement on objectives

Political agreement should target the establishment of functioning spectrum markets by 2010, with substantial parts of the spectrum tradable and subject to flexible use. This would allow all players concerned to prepare for the new spectrum management environment and ensure a smooth transition for markets for services relying on spectrum usage.

5.2. Spectrum bands

In order to achieve the objective referred to above, tradability would have to cover a substantial part of the spectrum. A step-by-step approach focusing on a few "test-bands" cannot provide increased competition and innovation. Offering only limited tradable spectrum would entail the risk of anti-competitive hoarding behaviour and would limit the ability to learn from experience.

Spectrum used for public interest purposes, such as defence and scientific services, or managed at the global level, such as aviation and satellites, is not part of this proposal.

It is generally accepted, and supported by studies and public consultations, that spectrum bands used for terrestrial electronic communications services are best placed to deliver the benefits that would be made possible by markets. These bands also largely correspond to the initial bands selected by some of the Member States in their national approach to spectrum markets¹¹, and are the focus of RSPG work on a strategic approach to convergence.

The Commission proposes the introduction of markets for **frequencies currently used for the purposes listed below**, in order to ensure efficient coordination leading up to tangible results at Community level, for example:

- **terrestrial mobile communication services**, including e.g. frequencies for public mobile services, such as GSM and 3G, and frequencies used for closed user groups such as PMR and PAMR;

¹¹ The Commission is aware that some Member States also plan to make other bands subject to a market based approach.

- **terrestrial fixed wireless communication services**, including e.g. frequencies for Wireless Local Loop, Broadband Wireless Access and microwave links;
- **terrestrial TV and radio broadcast services**, including e.g. frequencies for local, regional and national broadcasting.

The choice of the actual bands will have to be validated in the coordination process and specific legislative proposals would need to be based on impact assessments. In this context, the costs for small economic operators should be taken thoroughly into account.

Bands as listed can be expected to function on a market basis within a short time. They are often already assigned as individual rights to use specified “frequency blocks” in specified geographic areas and right-holders are also often responsible for their own network planning and have experience with technology upgrades and interaction with markets. The reassignment of the spectrum released through the digital dividend will give a further boost to the efficient use of these bands (although it may be decided to manage part of the dividend through other models)¹².

While the special nature of public service broadcasting has to be taken into account, it should be recognised that the possibility for spectrum users to trade and use the frequencies in a more flexible way are options and not obligations. It may also be necessary to reassess the assumption that broadcasting as a public interest automatically requires terrestrial spectrum, since coverage obligations increasingly can be fulfilled by means other than terrestrial wireless transmission, given the growing reality of convergence and multiple platforms. This does not contradict the objective to safeguard the delivery of public service broadcasting, nor the continuing validity of other public policy objectives.

The envisaged scope of tradable bands would minimize the risk of hoarding of spectrum, as operators would not have the resources or the incentive to establish a dominant position. To the extent that competition problems would arise, competition law provides in principle adequate and sufficient remedies. In case the barriers to entry to a market are the result of unnecessary restrictions and limitations attached to rights of spectrum use, the appropriate remedy is to lift the restrictions concerned.

5.3. Transition issues

The introduction of spectrum markets is expected to impact the value of existing licenses, whether tradable or not, as well as on related investments. Such an impact might affect different right-holders in different ways. In any case, that impact will reflect the existing and future licensing conditions as well as the level of competition across the Community.

When handling the transition to a market-based approach, Member States should take the legitimate interests of right-holders into account, while at the same time ensuring the compatibility with competition law requirements and general Community law principles. In order to avoid penalising existing right-holders, it may be necessary, for example, to give them increased freedom in exercising their rights and to remove unjustified restrictions to the usage of those rights. This should be done in a gradual and non-discriminatory manner, while the market value for spectrum rights develops.

¹² See Communication on Accelerating the Transition from Analogue to Digital Terrestrial Broadcasting, COM(2005) 204 and related staff working paper SEC(2005) 661, p.10

5.4. Definition of spectrum rights

Certain aspects of tradable rights would need to be approximated, such as the common format (the document or “title”), and eventually the material rules that define the freedom of users to utilise and trade their rights. This would reduce transaction costs, enhance market transparency and increase legal certainty throughout the EU. It would also simplify change of ownership and encourage efficient usage, thereby facilitating large-scale innovation and economies of scale.

5.5. Coordination of information

It is essential for the functioning of spectrum markets that reliable information is easily available. Today, such information is held in national databases using different formats. It should in future be presented in a coordinated way to facilitate comparison of spectrum rights and enable buyers to find potential sellers throughout the EU. It is therefore necessary to develop an EU-wide one-stop portal with access to information on allocation, on assigned spectrum rights (national registries), on availability of tradable spectrum that remains unassigned or will become tradable at a foreseeable point in time, as well as on relevant national regulation and legislation. This can be facilitated by building on or expanding existing structures, such as the EFIS database within the European Radiocommunications Office.

5.6. Service and technology neutrality

Since technology and service restrictions are increasingly incompatible with convergence, it is important to address how tradable rights can be combined with flexibility, i.e. the right of a spectrum holder to use it for any service as long as the technical requirements are fulfilled.

Technology neutrality is a principle anchored in the present regulatory framework at EU level and should be defined when applied to spectrum so as to minimise the constraints, while ensuring that interference is appropriately dealt with. However, it must be realised that in certain cases the necessary interference management imposes constraints that in practice are more beneficial for one technology than for another. **Service neutrality** means that the choice of service offered via spectrum usage rights is made by the rights holder. Constraining the services for which the spectrum can be used is generally not justifiable from the standpoint of technical spectrum management. There are nevertheless broad categories defined at ITU level through the Radio Regulations, where rules on the avoidance of cross-border interference are imposed. In the field of terrestrial electronic communications, these categorisations are rapidly becoming obsolete.

There may be cases where the benefits of limiting services can be demonstrated and justified (e.g. achieving interoperability of services), and there are examples where such an approach has been very successful in developing service markets and satisfying consumer demands. It is therefore necessary to specify the criteria for establishing exceptions where service constraints can be justified when assigning spectrum usage rights and to adopt service neutrality as the rule otherwise.

6. NEXT STEPS FOR ESTABLISHING SPECTRUM MARKETS

The primary aim of this Communication is to seek political agreement at EU level on the broad objective of establishing spectrum markets by 2010.

To achieve this, the Commission intends to develop the following key features in an EU approach to spectrum trading:

Tradability

- the right to trade individual rights to use frequencies in a defined set of spectrum bands for electronic communication services
- the definition of a process for including bands in tradability
- the development of an initial selection of bands

Technology neutrality

- defining technology neutrality, establishing the least restrictive limitations possible

Service neutrality

- definition of the specific conditions of service provision that may in future be associated with the usage of bands

Spectrum rights

- approximation of spectrum rights; a common format to be followed by common definitions of various material aspects of the rights that define the freedom of users to utilise and trade their rights

Transparency

- access to information necessary for spectrum markets, including information on allocation and assigned spectrum rights (national registries), provided in a harmonised manner via an EU-wide one-stop portal

In particular, measures related to tradability, technological neutrality and service neutrality will be included in the review of the regulatory framework starting mid-2006. The legislative process has to be accompanied by impact assessments and an active dialogue with Member States, as well as a coordination process that can also cover the issues not included in the framework review. This would allow the practical implementation of trading to be developed while avoiding costly delays and fragmentation in the short term. Where necessary, the Commission may also issue recommendations. Coordination groups should be established as soon as possible to work on the key aspects identified. The coordination and legislative processes should inform and reinforce each other.

The process outlined above would be systematically accompanied by public consultations on specific proposals. The Commission intends to report on the progress achieved in its annual spectrum policy report.

7. CONCLUSIONS

Reforming spectrum management in the EU to introduce a market-based approach to spectrum distribution constitutes a major challenge. But it is worth accepting since **an effective introduction of spectrum markets would be:**

- **beneficial** in terms of the gains to Europe in competitiveness, in innovation potential and in strengthening the internal market as well as in increasing the variety of services offered to the consumer, along with the positive effects on the creation of jobs and external trade;
- **timely** and necessary because spectrum management as practiced so far has reached its limits due to technological progress, increasing demand on spectrum resources and the speed of changing business cases and markets;
- **feasible** in the proposed time frame.

The Commission invites the European Parliament and the Council of Ministers to endorse the approach outlined in this Communication.