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**COMMUNICATION FROM THE COMMISSION TO THE COUNCIL
AND EUROPEAN PARLIAMENT**

**A FORWARD-LOOKING RADIO SPECTRUM POLICY FOR
THE EUROPEAN UNION: SECOND ANNUAL REPORT**

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(Text with EEA relevance)

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1. SUMMARY

The radio spectrum is a **key resource** for many essential services in society: mobile, wireless and satellite **communications**, TV and radio **broadcasting**, **transport**, radio location (GPS/Galileo), and many other applications (alarms, remote controls, hearing aids, microphones, medical equipment, etc.). Radio technology also supports public services such as **defence**, **security/safety** and **scientific activities** (e.g. meteorology, Earth observation, radio astronomy and space research).

An **effective and coherent use** of spectrum in these areas can help the European Union meet its **Lisbon goals** by stimulating growth, competitiveness and employment. Current inefficiencies in the distribution and use of spectrum create costs, lead to wasted opportunities for business and reduce the take-up of innovative services to the detriment of consumers.

Spectrum management has a strong cross-border dimension, given the European and global markets dependent on radio-based services, as well as the need to avoid harmful interference between countries. A **coordinated spectrum policy in the EU** aims to enhance a genuine single market for radio services and equipment. In this respect, the Commission intends to take concrete actions to:

- **Lower barriers to access** to spectrum, improving efficiency, promoting innovation, greater flexibility for users and more choice for consumers.
- **Allow convergence** to become a reality, by removing artificial restrictions, notably between broadcasting and mobile communications.

This report briefly sets out the Commission's strategy for a coherent EU radio spectrum policy as part of the i2010 initiative, which seeks to encourage the development of the digital economy. In particular, the need for a gradual but systematic **liberalisation** of radio spectrum use is essential. While bearing in mind national interests in this matter, **common action** at EU level will give a critical contribution to the coherence and final success of this task.

2. THE STATE OF RADIO SPECTRUM POLICY AT EU LEVEL

This is the second report on activities undertaken under Decision 676/2002/EC of the European Parliament and of the Council of 7 March 2002 on a regulatory framework for radio spectrum policy in the European Community (the "**Radio Spectrum Decision**" - RSD). It presents a consolidated view of on-going actions and future challenges for an EU-based spectrum policy, and sets such issues within a broader policy context.

Europe's leadership in the development and take-up of radio technology depends on the efficient use of spectrum and on the decisions policy-makers take in this respect. In its first report on Radio Spectrum Policy in the EU¹, the Commission identified the **need for reform** in the management of this precious resource.

¹ COM(2004) 507.

The EU Member States, largely responsible for their national spectrum assets, have already acknowledged the importance of a common EU policy in this area for the establishment and functioning of the internal market. They also agreed on the need for a **long-term, policy-based approach**, aimed at improving the flexibility and responsiveness of spectrum management, with a view to increase competitiveness and foster innovation, while taking into account general interest objectives².

In the past year, this policy has moved on from its initial set-up phase to the first concrete results. High-level discussions have been launched on important radio spectrum policy issues, such as the introduction of **spectrum markets**³ and **transition to digital TV**⁴. The first harmonisation measures to sustain citizens' access to innovative technologies and to develop the EU internal market have also been adopted, supporting **wireless internet connectivity**⁵ and **car anti-collision systems**⁶. The Commission also provided guidance to support EU interests in international negotiations and considered ways to improve spectrum information availability. Details of these activities are set out in Annex 1.

3. THE CONTRIBUTION OF SPECTRUM POLICY TO THE LISBON GOALS

At the European Summit of March 2005, EU leaders renewed their partnership for growth and jobs, including by building a fully inclusive information society, based on widespread use of information and communication technologies (ICTs) in public services, SMEs and households⁷. With the **i2010 initiative**, the Commission fully supports this analysis and emphasises ICT as a major driver of competitiveness and growth⁸. The creation of an open and competitive single market for information society and media services within the EU is critical to ICT uptake.

Within this context, there is clear understanding that a knowledge-based and mobile information society requires significant improvements in spectrum management⁹. **Removal of restrictions on access to spectrum** by emerging radio technologies can assist in their timely uptake, create better conditions for long-lasting and balanced economic progress and employment, and improve quality of life for citizens.

The importance of spectrum policy decision-making is exemplified by its impact on development of the mobile communications sector. In the eighties, this was a small market, fragmented at national level. The EU's timely provision of harmonised frequencies "triggered" the development of a new pan-European digital cellular system (**GSM**). The EU also encouraged a gradual introduction of competition in this sector via new licences, and funded the coordination of industrial R&D activities. This coherent approach was instrumental in the emergence of an industry which generated in 2004 a GDP contribution of € 105.6 bn for the EU 15 alone. The mobile services industry is estimated to have created

² Council Conclusions 15530/04 and 15533/04 of 3.12.2004.

³ COM(2005) xxx.

⁴ COM(2005) 204.

⁵ Decision 2005/513/EC.

⁶ Decisions 2004/545/EC and 2005/50/EC.

⁷ European Council Conclusions 7619/1/05 Rev. 1 of 23.3.2005.

⁸ COM(2005) 229.

⁹ See e.g. the PWC study for the EU Presidency, "*Rethinking the European ICT Agenda*", August 2004.

2.8 million jobs in the EU 15. According to current trends, it shall soon overtake in turnover the agriculture sector, or the electricity, gas and water industries put together¹⁰.

More recently, spectrum policy decisions fundamentally influenced the next generation of mobile communications (“3G”). While harmonised spectrum for 3G was identified in the EU¹¹, the licensing of operators displayed widespread national variations, with different timing and assignment mechanisms (various types of auctions, comparative bids or mixed approaches) which reflected in reality diverging national policy goals. The overall licensing proceeds (some € 109 bn) were spread very unevenly across the EU. Given the mobile sector’s increasingly pan-European strategies, more EU coordination in introducing innovative spectrum assignment mechanisms could have mitigated some of the negative effects on the sector¹².

Spectrum management decisions are also critical to many other on-going societal “trends”, such as transition to digital TV, development of wireless offices, homes and schools, safer transport by air¹³, sea, rail and road, more effective services in public security and healthcare.

4. TOWARDS A COHERENT EU SPECTRUM POLICY

Member States have the same **overall aim** for management of radio spectrum, i.e. to **optimise use of this natural asset** for the “greater good” of society. However, finding the right approach to further this aim is made difficult by the many different interests affected by change, by the significant “legacy” of earlier decisions and by the impact national measures have on other countries and on the EU internal market.

4.1. *Seeking coordinated answers to common problems*

Improvements in spectrum management are being actively considered and introduced across the developed world¹⁴. The Commission is convinced that **effective spectrum reform will lead to significant gains for Europe**. However, ambitious national reforms in spectrum policies must be accompanied by adequate consideration of the EU perspective. The risk for Europe of undue fragmentation amongst national policies is that the existing, imperfect convergence in spectrum use will be undermined by unilateral action, without for that matter allowing reforms to reap the expected economic and societal benefits, given the relative lack of scale of national markets.

In the wireless sector, **market size matters**. The current rapid rate of innovation in IT industry-related radio applications can be linked to this industry’s focus on driving prices down for consumers by providing low-cost, standardised (i.e. non-proprietary), interoperable solutions – WiFi and Bluetooth are good examples. Besides relying on quick and cost-free access to radio spectrum, this approach is predicated on large markets being open to new applications, leading to greater incentives to invest and significant economies of scale.

¹⁰ Ovum study on mobile services for GSMA, 24.12.2004.

¹¹ Decision 128/1999/EC.

¹² See a study on 3G assignment by McKinsey, June 2002, for the EC.

¹³ e.g. via the development of an EU Radionavigation Plan (ERNP).

¹⁴ See e.g. the US Presidential Memo on Spectrum Policy of 5.6.2003 and follow-on activities.

This “level-playing field” for widespread technology uptake exists in the USA and in Japan (and in the future, in China and India), but is often missing in the EU market, which risks being too nationally fragmented to attract the substantial private commitment needed to develop new radio technologies and to sustain effective competition.

In essence, therefore, while it is clear that the use of the radio spectrum affects national prerogatives, it is equally evident that a genuine EU single market for radio-based equipment and services must be underpinned by **common policy and regulatory approaches** to spectrum access, in order to reach the required “critical mass” of reform, to convince industry and users that any innovative technology made possible by de-regulation could have access to the whole EU market, and to safeguard public services.

4.2. Moving towards new approaches to spectrum management

Lack of flexibility in spectrum management to follow technological evolutions and consumer demands have led to a **spectrum “bottleneck”** for new radio technologies. In Europe, the imperfect nature of the single market for radio-based equipment and services compounds the overall problem. In practice, industry is still often confronted with different national regulations and contrasting policy approaches.

Spectrum has historically been distributed via detailed *ex-ante* administrative decisions. This approach has come under increasing pressure, due to the high technological turnover and the strong demand for wireless applications. The requirement for prior regulatory approval can severely delay or even prevent the introduction of new products.

In order to render spectrum distribution more flexible, new management models have been developed. The main two are:

- **Spectrum markets** can improve the efficiency of use of spectrum, since industry is better suited than regulators to identify the highest-value applications. The artificial scarcity of this good is to be tackled by creating a “free market” of tradable rights to use particular frequencies according to market demand.
- **Licence-exempt use (“commons” model)**, where equipment (typically low-power consumer goods) that fulfils certain technical conditions is used without a licence. This reduction in regulatory constraints has already allowed the creation of thriving new radio sectors using relatively small amounts of spectrum, and further flexibility would thus be beneficial.

An EU-wide balanced approach should be sought between all spectrum models¹⁵. The optimal “mix” between them will depend on various criteria, such as speed to market, protection from harmful interference, quality of service and fostering the internal market and innovation.

¹⁵ Other new management approaches are also being considered, such as “overlay” (cognitive radio), and “underlay” (UWB) spectrum access systems.

5. THE WAY FORWARD: OUTLINE OF KEY INITIATIVES AHEAD

The Commission intends to improve the effectiveness of the use of the radio spectrum in the EU by using a **coherent toolbox** of concrete actions in coordination with the Member States. A timetable for these actions is in Annex 2.

5.1. *Defining common, clear and flexible rules*

A **common set of rules for spectrum management** is needed to provide predictability for investors and borderless functionality of equipment for users. While an adequate EC legal basis for spectrum harmonisation and for radio equipment operation already exists¹⁶, the forthcoming Review of the e-communications regulatory framework will seek to integrate new spectrum policy approaches and to clarify spectrum-related concepts, such as efficiency and interference¹⁷. Common rules for spectrum trading will be considered, as well as a stronger EU dimension in licensing.

The Review will also provide the opportunity to clarify **technology and service neutrality** principles as applied to spectrum. Their application should be striven for as a rule, although they may be limited by technical considerations, such as avoiding interference. Further divergences from these principles would have to be justified on a case-by-case basis by overriding EU interests.

5.2. *Implementing flexibility of spectrum usage*

Spectrum usage flexibility can improve efficiency by enabling a broader choice on the uses of specific bands. Common conditions for such flexibility will be more advantageous for the EU single market:

- The Commission proposes to introduce **spectrum markets** in the EU by 2010¹⁸. A coordinated EU introduction would avoid undermining the benefits of an integrated European market in e-communications and could generate as much as € 9 bn/year net benefits¹⁹.
- The switchover from analogue to **digital terrestrial broadcasting** will release additional spectrum capacity (“digital dividend”), due to greater technical efficiency. The Commission shall support the Lisbon agenda by coordinating the introduction of pan-European innovative uses in part of the released spectrum. A target date for closing down analogue broadcasts across the EU (2012) will assist in this objective²⁰.
- A debate is under way²¹ on a common spectrum approach for all **wireless platforms** providing e-communication services. Spectrum regulations should recognise on-going **convergence** trends (broadcasting-cellular mobile; voice-data; fixed, mobile and nomadic uses), and not differentiate artificially between them. Frequencies for these applications should be gradually “pooled” together and made available to users as they see fit.

¹⁶ RSD and Dir. 1999/5/EC, respectively.

¹⁷ For instance in Art. 9 of Dir. 2002/21/EC and Art. 5 of Dir. 2002/20/EC.

¹⁸ See footnote 4.

¹⁹ Study by Analysys for the EC on spectrum markets, May 2004.

²⁰ See footnote 5.

²¹ RSPG Opinion on WAPECS, expected by end 2005.

- Consideration on how to extend the licence-exempt (“**commons**”) approach is also required at EU level, since any additional frequencies identified for this model would be more useful if available across the EU. In the EC regulatory framework, individual authorisations (i.e. licences) should be the exception, rather than the rule. That most of the spectrum is licensed at all is justified by the potential for **harmful interference** which would be caused by unfettered use. Risks and benefits of the current interference-avoidance process need to be clarified, to strike a better balance between protection of existing services and fostering innovation. The Commission is launching studies on the license-exempt approach and on interference in 2005.
- The development of spectrum-efficient technologies via for instance “**smart**” or **cognitive radio** could have a significant impact on flexibility. The Commission is using the funding available under the EU RTD Framework Programme to support this research²².

5.3. *Assisting the development of a common EU technological base*

Industry should have the opportunity to supply **innovative products** to the EU market as a whole, if it so wishes. The Commission intends to support the development of truly EU-wide markets and the unhindered circulation of radio goods and services by systematically identifying frequencies to be harmonised, and providing certainty to *de facto* harmonisation.

For the next reporting period, the following measures are envisaged:

- Supporting the uptake of **broadband** via:
 - 3G mobile communication (**IMT 2000** *et al.*);
 - Broadband Wireless Access (**BWA**) technologies;
 - hybrid **satellite 3G/data-broadcasting** applications.
- **Ultra Wideband**-enabled products (UWB): coordinated EU introduction of a potentially pervasive low-power/high-bandwidth technology in IT, telecom and consumer goods.
- **Short range devices**: enable an EU-wide mass-market of low-cost radio equipment to develop and promote innovation for numerous **daily-life applications**, such as wireless “smart tags” (RFID).

Furthermore, two areas identified by the Commission in i2010 as “*flagship ICT initiatives*”, will be considered for integrated actions to satisfy their spectrum requirements:

- **Technologies for independent living and health**: many assistive and medical applications are wireless, such as social alarms for the elderly and radio telemetry between patients and monitoring equipment.
- **The intelligent car** shall interact with its environment by radio means, via for instance inter-vehicle communications (IVC).

Identifying and harmonising the frequencies required for such applications could help in their take-up by creating common markets throughout Europe and reducing prices.

²² See for instance the E2R project at <http://e2r.motlabs.com/>

5.4. *Optimising the impact of EU actions*

Some general issues shall also be further developed in the next reporting period:

- **Regulatory impact assessment:** appropriate methodologies are needed to assess the economic and societal consequences of specific decisions. Efforts should be undertaken to co-opt the knowledge of industry and other stakeholders via position papers, public consultations and/or independent studies.
- **Reviewing the validity of harmonisation measures:** the continued relevance of EU measures shall be assessed periodically. Instead of across-the-board “sunset” clauses, which could bluntly pre-empt reasoned review results, each annual report should consider existing EC spectrum regulation, and propose targeted action as necessary.
- **National implementation:** the Commission will monitor and encourage the timely implementation of EC spectrum harmonisation measures at national level to remove barriers to a single market for radio technologies across the EU.

5.5. *Supporting EU interests in international negotiations*

The active promotion of EU policies in international spectrum negotiations is essential. Preparations for two ITU conferences are on-going:

- The **Regional Radiocommunication Conference (RRC-06)** involving some 120 countries, will develop a technical plan for digital land-based broadcasting. The Commission is requesting the Member States, which negotiate in the ITU, to ensure that this planning does not unduly constrain policy options on future uses of spectrum freed by switching over to digital broadcasting, including for pan-European services²³.
- The **World Radiocommunication Conference (WRC-07):** the Commission shall identify common EU priorities and objectives for these global radio negotiations. Main issues at stake in 2007 shall be the global identification of additional spectrum for advanced mobile communications, for aviation systems and for short-wave radio broadcasting.

Following these two conferences, the Commission shall assess results and the extent to which the current process supports EU policies, principles and laws in international negotiations.

5.6. *Developing the institutional set-up of spectrum policy at EU level*

The Radio Spectrum Committee (RSC) and the Radio Spectrum Policy Group (RSPG) are working well. However, spectrum policy developments in the EU rely also on close interaction between these EC mechanisms and CEPT²⁴. With EU expansion, the “actors” in these decision-making bodies have become very similar.

While experiences to date are positive, future **action needs to be more complementary**, without undue overlaps and with clear understanding of where appropriate decisions are best taken. A “sequential” approach, applied systematically and based on modalities defined in the

²³ COM(2005) xxx.

²⁴ The 46-strong European intergovernmental organisation pre-dating the EU’s involvement in telecoms and spectrum. It is a recognised regional entity in ITU.

RSD, would best use the “added value” of each mechanism. The **underlying justification** for action would be assessed and agreed using Community mechanisms (Commission with RSC and RSPG), while the necessary and often complex technical **compatibility and development** work would be undertaken by CEPT pursuant to a mandate. In the light of this work, the Commission would then adopt **technical implementing measures** with the assistance of the RSC²⁵.

6. ACHIEVING POLITICAL CONSENSUS ON FUTURE STEPS

The European Parliament and Council are invited to endorse EU actions in spectrum policy and to:

- recognise the importance of spectrum for the establishment of the single European Information Society in support of the renewed Lisbon partnership for growth and employment;
- support a common strategy for an efficient spectrum management in the EU, and the need to promote innovation through an effective combination of flexibility and coordinated use of spectrum.
- collaborate closely to ensure the full success of this strategy.

²⁵ Coherence with other relevant groups, notably TCAM and ETSI, will also be essential.

ANNEX 1: DEVELOPMENTS SINCE THE FIRST REPORT

The RSD articulates four different areas of common EU activity in spectrum policy. Here are the major issues tackled in these areas in the period under consideration:

<i>General Policy Issues</i>	<i>Documents</i>
Switchover to Digital Broadcasting	<p>RSPG Opinion of November 2004, document-RSPG04-55.</p> <p><i>RSPG considered that EU-level initiatives can and should promote and facilitate a coordinated approach to the spectrum implications of switchover to digital broadcasting.</i></p> <p>Communication on accelerating the transition to digital broadcasting.</p>
Secondary Trading	<p>RSPG Opinion of November 2004, document-RSPG04-54</p> <p><i>RSPG considered that trading may be beneficial in certain parts of the spectrum, subject to sufficient safeguards to ensure that potential benefits are not offset by adverse consequences, and can contribute to reach the Lisbon strategic goal.</i></p> <p>Communication on the implementation of markets for radio spectrum in the EU.</p>
A Common Flexible Approach for e-Comms.	<p>RSPG Opinion on WAPECS under preparation following Commission Request (document-RSPG04-45 Rev) – public consultation launched</p>
Licence-free Spectrum	<p>Independent Studies launched on “commons” model and on interference management</p>

<i>Date of Adoption</i>	<i>Technical Implementing Measures</i>
8 July 2004	<p><i>Road safety:</i> Decision on the harmonisation of the 79 GHz band for the use of automotive short-range radar equipment in the EC</p>
17 January 2005	<p><i>Road safety:</i> Decision on the harmonisation of the 24 GHz band for the time-limited use by automotive short-range radar equipment in the EC.</p>
11 July 2005	<p><i>E-communications:</i> Decision on the harmonisation of the 5 GHz band for the use of wireless access systems (WAS/RLAN) in the EC.</p>
15 July 2005	<p>RSC agreement on the re-use of the ERMES paging band; adoption of an EC Decision, (to support hard-of-hearing devices, for tracking stolen cars <i>et al.</i>), dependent on the repeal of Council Directive 90/544/EEC (see Proposal for a Directive).</p>

<i>Spectrum Information</i>	The Commission is discussing with the RSC the implementation of some of the results of a study on coordination of information on spectrum allocation and use in the EU.
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<i>International Spectrum Negotiations</i>	
WRC-07	<p>RSPG Opinion under preparation on EU priorities and objectives for the ITU WRC-07 conference, with input from all stakeholders via a public consultation and workshop.</p> <p>EU Policy input (Information Note) - document RSPG05-71.</p> <p>Study on Future spectrum needs for Mobile Communications (WRC-07 issue) –see results.</p>
RRC-06	<p>RSPG discussion on policy aspects of ITU RRC-06 conference.</p> <p>Communication on the EU priorities for the ITU RRC-06 conference</p>

ANNEX 2: TIMETABLE OF ACTIONS IN EU SPECTRUM POLICY

Note: this list is indicative only and specific actions may be added, removed or modified.

2006	<p>Proposals on coherent flexibility in spectrum bands used to provide e-communications services (WAPECS).</p> <p>Proposal for a common format of usage rights in the context of spectrum trading</p> <hr/> <p><i>Harmonisation measures:</i></p> <p>Adoption of an EC Decision harmonising the use of the so-called “IMT-2000 extension band”.</p> <p>Adoption of one or more EC Decisions harmonising the use of ultra wideband (UWB) applications.</p> <p>Adoption of an EC Decision providing a framework for the harmonisation of spectrum access for a large number of Short-Range Devices (SRD).</p> <p>Abrogation of the ERMES Directive and adoption of an EC Decision harmonising the use of this former paging band.</p>
2007	<p>Proposals regarding spectrum-related issues, including licensing, in the Review of the 2002 e-communications regulatory framework.</p> <p>Proposals for the coordinated use of part of the broadcasting digital dividend, following the completion of the ITU RRC-06 conference.</p> <p>Introduction of an EU-wide approach to licence-free spectrum.</p> <p>Implementing improvements to the process of interference management.</p> <p>Setting out EU priorities for the ITU WRC-07 conference.</p> <hr/> <p><i>Harmonisation measures:</i></p> <p>Broadband Wireless Access and Mobile Satellite applications.</p> <p>Assistive and medical wireless applications.</p> <p>Wireless applications for the intelligent car.</p>
2008	Coordinated EU introduction of relevant results of the ITU WRC-07 conference.
2009	National implementation of new e-communications rules .
2010	Full establishment of a functioning EU market for major parts of the spectrum.
2012	Proposed date for completing switch-off of analogue broadcasting in the EU.