COMMISSION OF THE EUROPEAN COMMUNITIES

Brussels, 11.6.2002
COM(2002) 301 final

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

Towards the Full Roll-Out of Third Generation Mobile Communications

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EXECUTIVE SUMMARY

At a moment when most Member States have issued 3G licences, the great expectations associated with the introduction of a new mobile communications generation contrast significantly with the perceived difficulties of the sector to become a commercial reality in Europe.

Advanced wireless platforms such as 3G are an essential building block to achieve the goals of the Information Society in terms of consumer demand, productivity, competitiveness and job creation. This was recalled by the Barcelona European Council in March 2002 that asked the Commission to present at the Seville European Council *"a comprehensive analysis of remaining barriers to the full roll-out of 3G mobile communications"*.

The document provides an overview of the situation of the 3G sector today, analyses the major financial, technical and regulatory challenges associated with the roll-out of 3G services and identifies options to support this process.

The sector is best served by letting the market drive the process ahead, though public authorities can contribute to confidence by ensuring a predictable and stable regulatory environment conducive to a competitive market serving the consumers' interests. In the immediate future, they can facilitate the physical deployment of networks by harmonising the conditions and accelerating the procedures. In the longer run, harmonisation in licensing conditions and assignment across the EU would avoid market distortions and uncertainty in the sector.

The take-up of 3G is a continuous process which requires continued attention by public authorities. There are no simple answers to the challenges ahead but 3G has developed sufficient momentum to overcome the present difficulties. The Commission remains confident in this respect.

1.   INTRODUCTION

In March 2001, the European Commission issued a Communication on Third Generation (3G) Mobile Communications[1]. In this document the Commission identified some factors that may critically impact the successful uptake and development of 3G services in the EU and proposed action lines in this respect.

One year later and at a moment when nearly all Member States have issued their 3G licences, the great expectations associated with the introduction of a new mobile service generation – further fuelled by the popularity and continued growth of mobile penetration over the last year - contrast significantly with the perceived difficulties of the sector and the fact that, with few exceptions, 3G is not yet a commercial reality in Europe.

On the other hand, the European Union committed to an ambitious target for economic and social renewal at the Lisbon European Council[2]. The Commission's *e*Europe 2002 Action Plan was part of the response to this challenge[3]. Advanced wireless access platforms such as 3G are an essential building block to achieve the goals of the Information Society, in terms of satisfying consumer demand, increasing productivity, ensuring competitiveness and creating jobs.

In this perspective, the roll-out of 3G networks and services is an important target and is now high on the agenda of all involved players. Many actors are involved in this process and challenges associated with the next steps are the result of a complex interaction of influencing factors, not all of which are directly related to the mobile sector itself. Furthermore, the introduction of 3G services constitutes a major step that requires time in order to settle the many changes it brings about. These include the technical implementation, the development of a new service market, the adaptation of business structures to a new value chain, and new patterns of consumer behaviour.

In March 2002, the Barcelona European Council reasserted, in its conclusions, the importance of third generation mobile communications for the progress of the Information Society in Europe and called upon the Commission *"to present at the Seville European Council a comprehensive analysis of remaining barriers to the full roll-out of 3G mobile communications"*[4].

In an attempt to offer a realistic and objective assessment of the current situation and to identify, where appropriate, priorities for action, this Communication provides an

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[1]   "The Introduction of Third Generation Mobile Communications in the European Union: State of Play and the Way Forward", COM(2001)141 final, 20.3.2001.

[2]   The Lisbon European Council in March 2000 set out the strategic goal of making Europe the most competitive and dynamic knowledge-based economy by 2010 (Presidency Conclusions, paragraph 5). For the full text see http://ue.eu.int/en/Info/eurocouncil/index.htm.

[3]   The *e*Europe 2002 Action Plan was proposed by the Commission in the context of the Lisbon strategy and endorsed by the Feira European Council in June 2000. The Commission has recently adopted a new *e*Europe2005 Action Plan (COM(2002)263 final), to be considered by the Seville European Council in June 2002. Information on eEurope can be found at
http://europa.eu.int/information_society/eeurope/action_plan/index_en.htm.

[4]   Barcelona European Council of March 2002, Presidency Conclusions, paragraph 41. The full text can be found at http://ue.eu.int/en/Info/eurocouncil/index.htm

overview of the recent evolution and the situation of the 3G sector today from the financial, technical, market and regulatory perspective (chapter 2). It then analyses the major challenges associated with the roll-out of 3G services and identifies options at EU level to support this process (chapter 3). This analysis recalls and assesses actions undertaken since the last Communication, identifies measures required to address short or medium-term needs and proposes some future action lines based on the assessment of the roll-out of 3G so far.

2. RECENT DEVELOPMENTS AND CURRENT STATE OF PLAY OF THIRD GENERATION MOBILE COMMUNICATIONS

The roll-out of 3G services entails a complex interaction between different players (ref. scheme in Annex 1). Obviously, when considering the benefits of 3G, the consumer – i.e. the individual, business and the society as a whole – is to be placed in the centre. In order to offer 3G services, market players must roll out networks and operate them, provide attractive applications, content and services, and make suitable terminals available. In a simplified scheme, the major players involved are the manufacturers, the operators and the software/content providers, but the value chain is in fact developing towards a much more complex structure with partly overlapping interests of the players. All the parties involved need financial resources that are available through different channels. Finally, the framework is set by regulation at different levels (local/regional, national, and Community level) as well as standards development organisations or radio spectrum management bodies. All players do not only pursue different interests, but also act along different timetables as far as their contribution to the 3G roll-out is concerned.

In addition to its inherent complexity, this web of interests does not evolve in a vacuum but is highly dependent on the general economic, technological and service trend, because of the wide range of activities resulting from the anticipated broad service range on offer. In this respect, 3G roll-out is by far more complex than the deployment of the second generation (2G) of mobile communications.

When reviewing the developments since last year, one observation is that the role of some of the involved players and the impact of their relationship have significantly evolved.

2.1. Financial Environment

During the year 2001, the global economy has contracted although a gradual recovery is shaping up in Europe and even more in the US. The telecommunications sector has been no exception to the slowdown.

However, the EU telecommunications market still over-performed the general economy, with a turnover of €224bn and a market growth of some 10% in 2001, with the mobile sector contributing by some 40%[5]. Also, penetration of mobile in the Community now stands at over 75% (an increase of over 10% with respect to 2001) with a total of some 125 million handsets sold in 2001. After a decrease over the past years, the average revenue per user (ARPU) has stabilised at about €30 per month.

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[5] European IT Observatory (EITO) report 2002.

Nevertheless, in spite of these comparatively good performance, the sector has been faced with an increased pressure from the financial markets. During the previous period, characterised by an above average growth, the sector decided to invest considerably, notably in acquiring market shares (mergers & acquisitions) and in future businesses such as 3G, with some €110bn spent on licences. This has generated a sharp increase of the debt level of telecom operators and consequently a downgrading of their credit ratings. 3G licensing has certainly contributed to this situation but is only one among several factors affecting the telecommunications sector overall.

Over the past year, the downgrading of credit ratings has continued and a significant erosion of the market capitalisation of both operators and manufacturers could be observed. Today, the availability of investment funds is significantly reduced, especially for alternative carriers and new entrants. This comes at a moment when, after years of preparation, the physical roll-out of networks and the preparation of service offers require significant financial resources on the side of network operators.

This trend has contributed to an erosion of the business perspective of the telecom sector overall, including mobile operators. The increase in competition in the sector resulting from liberalisation coincides today with a difficult technological and market transition. In particular, those players that cannot leverage their 2G experience and customer base are exposed to heavy financial commitments before being able to generate any revenues from mobile services.

The difficult financial environment has obliged all telecom operators, including mobile operators, to revise their strategies and give priority to re-balancing their sheets, by selling non-core business, exploring new revenue sources and identifying ways to reduce capital expenditure. This overall trend of the sector has also affected the plans for 3G roll-out in different ways. For instance, some operators have given higher priority to explore alternative means to increase their ARPU by considering offering new services in 2G, such as GPRS[6]-based services. Reducing investment expenditures is another priority for operators, as indicated by the several cases of network infrastructure sharing, through which operators expect to lower considerably their initial capital expenditures.

The overall difficult financial situation for operators has led to a reassessment of the sustainability of 3G in markets with a high number of licensed 3G operators. A discussion has also started on how to deal with this situation in case consolidation becomes inevitable.

For the manufacturers, the financial strain resulted not only in an increased pressure by operators on network equipment prices, but also in growing recourse to vendor financing of equipment, which burden the manufacturers' business results. In addition, handset sales diminished due to market saturation and the operators' reduced investment in subsidised terminals. A further trend is the entering into alliances or even outsourcing agreements with respect to the development and manufacturing of 3G handsets.

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[6] General Packet Radio Service: an evolution of the GSM platform allowing for 'packet switched' transmission over GSM networks.

Overall, the financial environment is still challenging and has affected the 3G roll-out. However, the extremely pessimistic predictions of last year have not materialised and industry has started tackling the issue.

2.2. Technology

As the announced deployment of 3G services gets closer, the availability of functioning network and terminal equipment becomes crucial. The reports – both success stories and news about failures – are often taken out of context and interpreted in different and contradictory ways.

Today, there seems to be confidence that network equipment is available and manufacturers are committed to guarantee inter-operability of equipment. To date, terminals are not readily available for consumers. However, the capability of producing large batches of terminals is evidenced by the reports of delivery contracts to some operators and by the announcement of 3G handset models before the end of the year.

Over the past year, the standardisation work carried out in the context of 3GPP[7] has continued to be successful. A major milestone was achieved with the release of a new sets of specifications (the adopted Release 4 and Release 5, pending for adoption) which gradually pave the way for 3G networks to ultimately be consistently based on internet protocols. This is a decisive development for operators as it preludes to a fully integrated network approach (e.g. mobile and fixed) thus providing for a future-proven network concept. In this context, the strong push for preparing the introduction of the IPv6 protocol by the Commission, supported by a recent Council Resolution[8], is complementary.

Compared to last year, significant progress has been achieved on the handset side, with the transition from prototypes to the development of first 3G models ready to be commercialised on the European market. In Japan, where 3G was launched last year, there are now over 100,000 3G terminals in use from a limited number of manufacturers, with a variety of basic models available (e.g. handset with video camera, PDA-type of terminal, plug-in interface for PCs). Several manufacturers have announced the launch on the European market for the second half of 2002 of 3G terminals with a "dual-mode" capability (2G + 3G), a decisive feature for the European consumer accustomed to a full coverage 2G service environment, especially when considering that 3G coverage is expected to grow only gradually. Additional new features for European 3G terminals are already available today or can be expected in the near future: high-resolution high-contrast colour screens, better energy efficiency to boost battery capacity, and integration of multimedia functions (e.g. MP3 player, radio, games, recording function, sophisticated organiser functions such as calendars, micro browsers and Java-enabled handsets).

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[7] Third Generation Partnership Project.

[8] COM(2002)96, "Next Generation Internet – priorities for action in migrating to the new Internet Protocol IPv6". This Communication has induced the preparation of an IPv6 Action Plan which is now in place and which will bring significant benefits to 3G, once the market picks up and as 3G services diversify (e.g. man/machine or machine/ machine interaction; quality of service to be adapted to requirements of applications and ensured using features if IPv6).

The past year has also witnessed the completion of the upgrade of existing 2G networks to GPRS. This upgrade paves the way towards the so called 2.5G services, offering both higher data transmission rates than GSM and "always-on" capability by introducing the packet-switched operation mode in GSM networks. Services making use of these features will obviously play an important role to test and prepare the future 3G market. GSM handsets with GPRS capability are today already on the market.

In conclusion, 3G technology seems to be stable today, despite reported technical difficulties (such as dropped calls, glitches in the terminal software, and reported insufficient battery capacity) that must be seen as normal difficulties encountered when introducing new products of considerable technological innovation. The need to ensure interoperability of terminals has been recognised as a key issue by manufacturers and operators, who are acting jointly to iron out problems resulting from options left open under 3GPP standards.

2.3. 3G Services Market

In Europe, commercial 3G services are to date not available, apart from the small-scale pilot service trials on the Isle of Man and in Monaco. This has been interpreted as an overall "delay" and taken as an alarming signal for Europe failing to progress with the transition towards data-centred services in mobile communications. However, EU legislation[9] called on national administrations to set in place licensing modalities that would allow for operators to be in a position, at the latest as of the beginning of 2002, to launch commercial 3G services should they decide to do so. The legislation has not set out specific dates for the start of 3G services.

In the rest of the world, 3G services have only been launched on a commercial basis in Japan with the provision of commercial 3G services in the Tokyo area since October 2001. By the end of April 2002, 3G had attracted some 106,000 paying customers. However, consolidated conclusions can only be drawn once all major urban areas are covered and once 3G users experience the roaming capability of the new service offer. It is also noteworthy that in Japan data service offers using 2.5G access networks, e.g. for advanced messaging including the transmission of still pictures using camera-equipped terminals, seem to be remarkably well accepted by consumers, as the rapid growth of the number of users of these services demonstrate.

There are several encouraging signs that the shift towards a data focused service environment is about to start. 3G services are likely to be faced with a growing market demand once they become a commercial reality, as announced by several 3G licensees for the second half of 2002.

Firstly, the increase of SMS traffic growth remains steady and operators have consolidated the revenue share they draw from this service[10]. SMS is the only data service which today is available in Europe on a large scale with the current mobile generation. Its wide acceptance as "normal" part of the 2G service package suggests a strong demand for more sophisticated messaging services that 3G will serve. All

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9   Decision 128/1999/EC. Text available at
     http://europa.eu.int/information_society/topics/telecoms/radiospec/mobile/legislation/index_en.htm
10   Monthly figures of SMS traffic in Europe have increased from around 4 billion in January 2000 to 30 billion in December 2001. Current projections indicate a steady increase.

operators are busy exploring the next generation of messaging services that will offer the possibility to attach multimedia objects, such as pictures, audio clips and ring tones.

Secondly, the number of European GSM operators capable of offering GPRS services has jumped to over 50 by January 2002, although a full-scale advertising of the new service option and outright support has been cautious so far. Together with the availability of GPRS terminals, it is expected that valuable feedback on the acceptance of new services offered via GPRS will be available soon.

Thirdly, "i-mode" services (data based services using GPRS-enhanced GSM networks) are now available on a commercial basis in two Member States (Germany and the Netherlands) and have been announced in another one (Belgium). This is a strong indication of confidence in the 2.5G services offered by operators, if one takes into account that they take the risk of marketing services requiring dedicated terminals.

Finally, services and applications demonstrations, such as booking of tickets, download of audio or even video clips, banking transactions, location-based services[11] and often a combination of these capabilities, witness the continuous efforts to develop sophisticated applications.

Significant progress towards the development of 3G has become visible during the last year and a confirmation of this trend is expected for the second half of this year. A random screening of public announcements made by European 3G licensees has revealed that a significant number of them expect or intend to launch 3G commercial services before the end of 2002, while the others expects to proceed in 2003 or beyond. Meanwhile, 2.5G access networks is available, although commercial service offers are still limited. It is too early to assess to what extent 2.5G is a necessary intermediate generation, as anticipated by many observers, for developing a mass market for data services. Strategies of operators vary, with some of them possibly targeting an early start of 3G service offering to tap a demand, mainly from business users, for comparatively high-speed data access on the move.

2.4.   Regulatory Environment

At the beginning of 2002, all Member States had finalised or at least started 3G licensing procedures, as foreseen under the EU regulatory framework. With the exception of two countries (France and Ireland) where the procedure for attributing 3G licensing is still under way, all countries have by now issued 3G licences. By the 3rd quarter of 2002, sixty-one 3G licences will have been issued in the EU[12].

The licensing procedures over the last year revealed several trends:

Among the five Member States issuing licences since the last 3G Communication, four (France, Belgium, Greece and Luxembourg) did not succeed in attracting a sufficient number of interested parties to issue all offered licences, and this trend is likely to be confirmed by the outstanding licensing processes in France and Ireland.

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[11]   These services will be based on the location information of the user, obtained either by using the mobile network itself or from satellite navigation systems, such as the future European system "Galileo".

[12]   In addition, several accession countries have completed or started their 3G licensing process.

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This will lead to a situation where in five Member States part of the amount of spectrum made available for 3G will remain unused for the time being.

Concerning the conditions attached to 3G licences, roll-out obligations came under scrutiny in those countries where early coverage obligations proved to be incompatible with the availability of equipment or the realistic possibility for operators to roll out networks. In the case of Spain, Portugal and Belgium this led to postponements of the roll-out deadlines, coupled in certain cases with a procedure to reassess the situation in view of confirming new deployment target dates. In other Member States (Sweden and Finland), operators complied with roll-out obligations, albeit by setting up minimal network configurations used for experimental, rather than for commercial service, purposes. In the majority of Member States, roll-out obligations specified later deadlines, hence the verification of such obligations does not come up at this stage.

In France, after a partial completion of the licensing procedure, the licence price was considerably lowered and the payment modality changed in order to couple payments stronger to the turnover of the future business case. Italy is considering to readjust the licence duration (from 15 to 20 years). Spain proceeded with two annual adjustments of spectrum reservation fees that considerably impacted on the operators' business case.

In conclusion, and at the end of the licensing process in the Community, the number of 3G licensees in each Member State seems to be sufficient to allow for the development of a competitive environment. However, a certain number of adjustments have been made in some Member States in respect of the licensing conditions as set out originally.

3. **TOWARDS FULL ROLL-OUT OF THIRD GENERATION MOBILE COMMUNICATIONS: CHALLENGES AND RESPONSES**

The Commission has conducted a continued and diversified dialogue with all stakeholders in view of monitoring 3G roll-out and has launched a certain number of actions as identified in the Communication published last year.

The general consensus that seems to emerge through this dialogue can be summarised as follows:

- In this critical phase of rolling out 3G, it is **crucial to let the market operate** and the actors deal with the normal technological challenges ahead. Regulatory intervention is neither expected nor necessary. **Market players are ready to assume their responsibility**, and have done so until now. Intervention in the financial environment is not a task for public administrations which can, however, through their action contribute to increase the confidence in the sector[13].

- The **long-term goal to anchor 3G as one of the service platforms in a ubiquitous information society is shared and supported**. Recalling this target

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[13]   Support through institutional banks such as the EIB are limited but take place. The value of such a support lies less in its direct contribution to the overall investment volume than in the signal of confidence for the sector.

and confirming Europe's commitment to it will help to restore confidence in the sector.

- There are no short-term solutions, but rolling out 3G is an **evolving process** which, besides efforts by the actors directly involved, requires **from the public authorities** both **continuity of support and an open-minded approach to tackle challenges.**

Based on this consensus, the Commission has identified **three lines of action** that will contribute to assisting the sector and also demonstrate commitment and continued support towards achieving the goal of a full roll-out of 3G:

- There is a demand for **stability of the regulatory environment.** Regulation should provide for a harmonised and transparent environment, supportive to consumers' interests. The mechanisms of the **new EU regulatory framework** are adapted to evolving markets and technology, and should be used to support the roll-out of 3G at this sensitive stage.

- A certain number of difficulties have been identified in the short or mid-term, in respect of which **a proactive, supporting or stimulating role at Community level is seen as beneficial**.

- The experience with 3G points to the need for **drawing lessons and starting longer-term initiatives** which will benefit ultimately 3G as well as similar projects. This is particularly relevant in the perspective of the forthcoming EU enlargement.

Enhanced co-ordination across Europe and **further co-ordination of policy approaches** might be necessary to overcome the present challenges for 3G today, as well as to deal with spectrum-based technologies and services in future. Under the current regulatory framework, the Member States have used various methods to assign radio spectrum to 3G operators (auctions, comparative selections or a mix of the two) and imposed a variety of conditions. Close control of the present situation where operators are faced with 15 different regulatory regimes needs to be ensured in order to avoid that the concept of an Internal Market for mobile communications services is undermined. A study on this subject is presently being carried out for the Commission[14].

The adoption of the **new EU regulatory framework** for electronic communications, including the Radio Spectrum Decision[15], is a significant step forward in ensuring consistency in the EU with regard to wireless communication services. The **transparency and co-ordination mechanism** provided for under the new Framework Directive will have an important role to play in this respect.

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[14] Study on "Comparative assessment of the licensing regimes for 3G mobile communications in the EU and their impact on the mobile communications sector".

[15] The new regulatory framework for electronic communications and the Radio Spectrum Decision entered into force on 24 April 2002, see OJ L108, 24.4.02. The new framework will become applicable after a 15-month implementation period by the Member States. The Radio Spectrum Decision is applicable immediately.

The **Radio Spectrum Decision** establishes a general policy and procedural framework for discussing spectrum issues at EU level, for all Community policies relying on the use of radio spectrum (notably telecommunications, transport, broadcasting, space and research). The creation, in the context of this Decision, of two new bodies (the Radio Spectrum Policy Group and the Radio Spectrum Committee) is intended to ensure that the Member States' approaches are co-ordinated at an early stage.

3.1. Stability of the Regulatory Environment

When balancing the benefits and drawbacks of a rigid application of the conditions determined by the issued 3G licences, the Commission is of the opinion that in principle the **licensing conditions should not be changed** because the sector is best served by a predictable environment. Predictability allows business cases to be established in a reliable manner and to be credibly defended when accessing investment funds.

Changes to licence conditions should be envisaged only when circumstances have changed unpredictably and in these cases any modification should be proportional, transparent and non-discriminatory. Furthermore, in cases changes are envisaged, a harmonised approach should be worked out by Member States, using the new regulatory framework as a basis.

The analysis of the 3G regulatory environment outlined in the previous chapter shows that several issues need to be considered if **a predictable environment, though with the necessary flexibility**, is to be preserved:

- Concerning **roll-out obligations**, the Commission acknowledges that adaptation of deployment modalities may become necessary. However, such changes need to be undertaken under transparent and objective conditions. This would imply a public consultation on the basis of a reasoned and justified proposal for changing deployment obligations, as these can have different origins (e.g. such as non-availability of equipment and procedural difficulties to obtain authorisations for deploying base stations). It would also seem recommendable that in case such changes are proposed, they are discussed with other national administrations in an appropriate form so as to rapidly exchange information and best practices and to work towards a harmonised approach throughout the EU.

- Changes to **licence duration** are not assessed by the Commission as a priority to meet short-term challenges because they rather impact on the long-term development of the business case, which is today not clearly predictable. While a harmonised licence duration at Community level is desirable in principle, this represents a very complex process that is not in the view of the Commission an urgent action in the 3G context.

- **Changes in licence fees and charges or other payments associated to the 3G licences** once the licensing procedure is closed can be clearly counter-productive viewed from a business perspective. In general, the perspective of a changing payment level makes a business case unpredictable, while increases of payments would obviously further burden the sector.

- Besides the licensing conditions as spelled out in the 3G licences, the need may arise for clarification of the regulation in cases not foreseen by the original licences. This was the case for **network infrastructure sharing (NIS),** where the potential was originally not considered by operators but which is by now seen as an option to address environmental concerns, to ease the acquisition of base station sites and to lower capital expenditure when rolling out networks.

- The 3G Communication of last year invited a broad discussion on the potential of NIS. Subsequently, the Commission launched a dialogue with industry and the Member States in existing institutional fora as well as in high-level round tables with industry representatives[16]. This dialogue contributed to the clarification of the regulatory conditions applicable at national level to network infrastructure sharing[17], an issue that was not explicitly envisaged at the time of 3G licensing. The result is a general convergence of views on how to handle NIS, albeit some differences across Member States remain. Also, negotiations among operators on NIS agreements, pursued on commercial basis, are still limited and it is too early to assess how the full potential of NIS can be exploited by all interested parties equally and on fair terms. It is therefore envisaged to continue to work with national administrations towards establishing a best practice approach on NIS. Specific considerations relating to the compliance with competition rules in individual markets are relevant in this context.

Unavoidable adaptation of licensing conditions (such as roll-out) as well as the clarification of regulatory aspects relevant to new trends (such as NIS), are the responsibility of the Member States. However, the Commission will use the mechanisms foreseen in the **new regulatory framework,** which will be implemented by the Member States in July 2003. The Communication of last year identified the adoption of this package as a key milestone to create a supportive environment for the roll-out of 3G. The provisions of the texts adopted early in 2002 emphasise the need for national regulators and the Commission to co-operate in order to ensure consistency of measures taken. Matters relevant to 3G licensing will be discussed within the various bodies set up under the new framework and the Spectrum Decision.

Discussions with industry have given rise to concerns that the powers attributed to national regulators under the new EU regulatory framework could lead to undue regulation of 3G. However, these concerns need to take into consideration that the new regulatory framework is based on an approach limiting regulation to specific cases of market failure. Markets which are assessed are defined according to competition law principles and must have characteristics that may justify ex ante regulation. Recital 27 of the Framework Directive notes that newly emerging markets, where *de facto* the market leader is likely to have a substantial market share, should not be subject to inappropriate ex-ante regulation. This is because the imposition of ex-ante obligations could unduly and unnecessarily influence the

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[16] Discussions were held in the context of the groups and committees under the current telecom regulatory framework (National Regulatory Authorities, Licensing Committee, ONP Committee). In addition, two Roundtables on 3G were organised with the participation of CEOs of mobile operators in April 2001 and May 2002.

[17] Information on national rules applicable to network infrastructure sharing is available on the Commission website at:
http://europa.eu.int/information_society/topics/telecoms/radiospec/mobile/index_en.htm.

competitive conditions taking shape within a new and emerging market. It is difficult at this stage to foresee how services will develop in the context of 3G networks or the way in which they will be deployed and 3G services offered. Many of the services provided over 3G are likely to constitute new or emerging markets.

3.2.   Measures to Support the Roll-out of 3G

Obstacles to the Physical Deployment of Networks

Operators face considerable difficulties when deploying the physical networks, which at this point in time is a priority. Obtaining the **authorisation for installing base stations** has become a real challenge in a number of Member States, which risks to impact on the schedule of roll-out envisaged and increase costs unexpectedly.

The background to these difficulties lies in **the alleged health impact resulting from the electromagnetic emissions by base stations** as well as **environmental concerns,** as many new 3G masts are going to be erected. In most Member States the relevant decision processes are taking place at regional or even local level, and applicable procedures and rules vary considerably (e.g. construction permit from local authorities). Another difficulty faced by operators is the proof of compliance with emission regulation issued at national level which is not harmonised throughout the EU. These difficulties call for action at several levels.

The **planning procedures at national and local level** are not dealt with as such by the EU telecom regulatory framework. However, the new regulatory framework encourages public authorities to adopt measures that facilitate deployment, such as **co-location and facility sharing**. Regulators can thereby impose mast/site sharing under certain conditions. The exchange of existing practices among local authorities should be encouraged in order to find solutions that serve both environmental and Information Society objectives. On the other hand, the Commission notes and encourages the significant efforts undertaken by operators to increase the transparency of the planning of their physical networks and proactively seek a dialogue with local decision-makers.

Longstanding efforts at EU level have been taken to ensure health protection and to harmonise the **levels of emissions** considered safe. In 1999, the Council adopted a Recommendation on limits of exposure to non-ionising radiation[18], in line with international health recommendations. . In the absence of harmonisation, the Member States retain discretion to set the limits they consider appropriate, taking into account the 'precautionary principle'. This has led to very constraining rules in certain Member States. The Commission has recently published a report[19] summarising the practises in the Member States and has concluded not only that industry is hampered by the lack of harmonisation, but also that the citizen is confused about what is safe and what is not in light of differing approaches. There is an urgent need to initiate a

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[18]   Council Recommendation of 12 July 1999, 1999/519/EC. The SAR values of this Recommendation have been confirmed in October 2001 by the Scientific Committee on Toxicity, Ecotoxicity and the Environment.

[19]   Implementation report on the Council recommendation limiting the public exposure to electromagnetic fields (0Hz to 300GHz) available at
http://europa.eu.int/comm/health/ph/programmes/pollution/implement_rep_en.pdf.

dialogue among national administrations with a view to harmonising the applicable rules.

In parallel, the Commission has pursuant to the R&TTE Directive[20] undertaken to develop **technical specifications for safe mobile equipment**. These specifications are ready in form of Harmonised Standards for mobile terminals and are in the process of being finalised for base stations, with reference to the limits set out by the 1999 Council Recommendation[21]. They will therefore play an important role in promoting regulatory consistency across the EU. In addition, the Joint Research Centre of the European Commission has developed activities and competencies in the domain of electromagnetic field measurements that might be used in the development of **harmonised measurement methods** to assess the emission of mobile base stations.

The Commission views it a priority to contribute to a general awareness and understanding of the objective risks associated with the use of mobile terminals and base stations and to involve users associations in the debate. Considerable research work has been undertaken to investigate a possible impact on health. Current knowledge from a large body of scientific research[22] does not suggest that adverse health effects can be attributed to the normal use of mobile equipment which adhere to the existing safety exposure limits. This was confirmed by the recent updated opinion requested from the EC scientific committee and is also reflected by other international and national scientific committees and the WHO. However, further studies are necessary on how to decrease public exposure to the long term effects of EMF and keep total body exposure to radio-frequency fields within safe limits. The Commission is currently preparing **a public communication campaign** in order to contribute to better awareness of the matter by the general public and will seek the co-operation by Member States in this respect.

Overall, improved legal and technical clarity will increase protection and confidence of the citizens and facilitate network deployment.

R&D Activities and eEurope: a Focus on New Wireless Services

As stated in last year's Communication, the Commission attaches great importance to a continuous effort on the research side to accompany the present development of 3G and its future evolution. The Commission's proposal for the **6th Framework Programme**[23] contains relevant activities in this respect. Meanwhile, under the 5th Framework Programme useful results have been achieved.

Users will be interested in a new mobile service generation that adds value to the present service offers. Consequently, the Commission launched in October 2001 a **Mobile applications initiative** with the aim of testing innovative 2.5-3G services

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[20] Directive 1999/5/EC of the European Parliament and of the Council of 9 March 1999 on radio equipment and telecommunications terminal equipment and the mutual recognition of their conformity, OJ L 091, 07.04.1999, p. 10.

[21] Technical standard EN 50360 for handsets.

[22] Refer for instance to the activities of the COST Programme (COST 244, 244bis, 281) as well as specific research programmes under the current 5th Framework Programme.

[23] Information on the 6th Research Framework programme is available at http://europa.eu.int/comm/research/fp6/index_en.html.

and applications and supporting trials at a pan-European level[24]. This initiative gives industry the opportunity to jointly develop and test a number of innovative 2.5 and 3G mobile services and applications, to validate key interoperability issues and to consider the transition to the new version of the Internet Protocol (IPv6) thereby complementing the Action Plan mentioned earlier. The projects that have been launched are seed actions to promote collaborative research in selected areas including radio broadcasting, transport and emergencies, health, tourism, content and business applications and cover key generic aspect relevant to the early phase of 2.5 and 3G services. It is foreseen that results of these project be made available through a visible mechanism of continuous reporting.

Acceptance of the new mobile service generation will critically depend on content. In this respect, public sector information constitutes an invaluable asset for the citizen. It is therefore important to ensure the availability of this information as input for added-value and cross-border information services, as set out in the recent Communication on Public Sector Information and the proposed Directive on the re-use and commercial exploitation of public sector documents[25]. This goal is pursued also in the context of the *e*Content Programme, which aims at encouraging the production of multilingual and culturally diversified content and stimulating the dynamics of the digital content market in Europe[26]. The new eEurope 2005 Action Plan reaffirms the importance of 3G services and content and provides action lines in this respect.

Detecting New Regulatory Obstacles

As 3G applications take shape, new regulatory issues arise because the wide range of areas 3G services are likely to address touches on many regulatory aspects. The Commission will pursue these issues as they arise.

As an example, the **anticipated use of mobile terminals and in particular 3G services for micro payments** has brought up the question to what extent regulation applicable to the banking sector is relevant to the mobile sector. Such regulation, which was not designed with mobile communication service packages in mind - in particular applications providing for payment transactions - may constitute a serious burden and discourage innovative services. Commission services are presently examining the issue with a view to adapt, where necessary, existing rules.

3.3. A Longer-Term Approach

Although the roll-out of 3G at the present juncture faces immediate and important challenges, longer-term commitments need also to be considered at an early stage.

Long-Term Availability of Radio Spectrum

A major, often overlooked achievement of Community harmonisation, is the timely and effective availability of harmonised spectrum bands for 3G operations. Without this Community approach, it would have been very difficult to ensure that the same

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[24]   This initiative was launched in 2001 in the context of the IST Programme.

[25]   COM (2001)607 fin; COM(2002)207, 5 June 2002.

[26]   The Programme has a budget of €100 million over a period of 5 years. It is scheduled to run until January 2005. Information can be found at http://www.cordis.lu/econtent/.

3G frequencies be available across Europe to support pan-European roaming and economies of scale, two essential factors which in the case of GSM contributed to its success.

The radio spectrum available in Europe for 3G today is the result of a planning process that started about 10 years earlier. In view of the future availability of this scarce resource, it is therefore not premature to start the planning process at this juncture, although the 3G market is only about to start. The Commission has launched the process of planning ahead, as a follow-up of the WRC2000 conference which identified certain radio frequency bands for the different regions to consider for the allocation of radio spectrum in addition to the bands already available. Pursuant to the UMTS Decision, the Commission has mandated CEPT[27] to do the necessary technical consultation with a view to determine which spectrum bands are the preferred choice by Europe and what timing for the effective availability of these bands should be considered. A consensus on the first two aspects is likely to be reached before the end of the year, underlining the long-term commitment by administrations to make sufficient radio spectrum resources available.

Towards a Flexible Use of Spectrum

There is today a growing perception about the benefits of a **more flexible frame for handling rights of use of spectrum,** leading to more liquidity in investments made in the radio sector. This issue has recently come up in the context of the debate about a possible consolidation on the 3G market. Up to now, the right to use spectrum is coupled to services licences the transferability of which is constrained under the present EU legislation, where the number of licences is limited. For example, in the telecommunications sector, the only way today to transfer the rights to use radio spectrum is indirectly through mergers and acquisitions (subject to competition rules) or through handing back to the administration the licence, which would subsequently be offered as a new licence pursuant to the necessary public and open selection procedures. In July 2003, the new regulatory package will allow Member States to introduce spectrum trading subject to certain procedural conditions[28].

Using the mechanisms provided for by the Spectrum Decision, the Commission intends to establish a dialogue with industry and national regulators **on secondary trading** of radio spectrum and its implications. This will include a discussion of harmonised spectrum trading conditions and the debate on introduction timing in different Member States which would avoid distortions in the assignment process for services of Community coverage or interest.

Spectrum trading potentially changes the fundamental paradigm of future spectrum policy in the EU. In this respect, it has an important role to play in shaping also the future 3G sector, though it should not be expected to be a solution to short-term problems. While the ability of trading could be envisaged in respect of new licences, for instance in the context of 3G extension bands, its applicability to existing 3G licences is limited under existing regulation.

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[27]   This mandate was given to CEPT on 9 March 2001, after consultation with the Licensing Committee, ref. LC/01/02 rev2.

[28]   Article 9.3 Framework Directive, 2002/21/EC.

3G as an Open Service Environment

3G service provision is likely to depart radically from the model prevailing presently with a one-to-one relationship between mobile operators and their customers. In 3G, the origin of large parts of the service profile accessible by a customer is no longer necessarily or fully controlled by the operator. Innovative applications or specific content will need to be accessible even when originating outside of the network controlled by an operator and across different networks. This raises the issue of ensuring that the 3G platform accommodates an **open mobile services environment**. Experts expect significant difficulties if closed proprietary terminal and network configurations prevail. The notion of openness goes beyond 3G in the light of converging service environments (e.g. PC applications running on mobile handsets). Openness in this context will be a key factor facilitating convergence.

For 3G, openness needs to be ensured at different levels. For instance, application developers need to take into account the capability of individual handsets designed by a variety of manufacturers. Varying operating systems used by terminals, the choice of browsers and the lack of standardisation of Java-enabled terminals are inter alia potential obstacles to the design of applications which run on a large handset population or for the possibility of processing specific content. It is of key importance that interface specifications are made open and transparent to minimise these obstacles. At network level, the difficulty arises from the fact that part of the intelligence needed to support sophisticated applications is network resident. This bears a risk that proprietary network architectures become stumbling blocks for application developers.

The Commission could observe that the issue has been recognised by industry and that efforts are under way to find solutions. The Commission is also encouraged by the standardisation activities currently undertaken in 3GPP towards establishing the basis for an open service access. Several initiatives, such as the Open Mobile Architecture (OMA), have been launched by the manufacturing industry, and their impact will depend on the support of the vendor community at large and in particular of operators. In this context, the Commission also noted the M-Service initiative launched by the GSM Association. Both efforts bear a great potential of synergy.

The move of 3G towards an internet-based network approach will facilitate maintaining the open service characteristic, also in view of 3G integrating the family of alternative wireless or fixed access platforms which should characterise the full deployment of the Information Society. This will be subject to a separate report by the Commission, as requested by the Barcelona European Council.

The Commission will closely monitor the evolution of the value chain surrounding 3G services, and consider action if the evolution of 3G towards an open and competitive service environment would be threatened by proprietary solutions chosen by individual players. In this context, the Commission will consider the role of all involved parties, including those feeding into the mobile sector through content or application offers.

4.   CONCLUSIONS

The Commission believes that commercially-viable advanced wireless systems, including 3G, are indispensable for Europe to attain the goals set in Lisbon with respect to a competitive knowledge-based economy and the realisation of the Information Society.

After a continuous effort to develop 3G and to prepare for the deployment of a new wireless service generation, the roll-out of networks is finally under way while growing evidence for a significant market potential is emerging, albeit uncertainty as to its detailed evolution persists.

Besides a general economic recovery, to which the mobile sector including 3G could considerably contribute, the sector is best served by letting the market drive the process ahead, and by allowing healthy competition to generate new products which consumers will want to buy. Administrations, including the Commission, can however contribute to confidence in the sector by ensuring a predictable and stable regulatory environment conducive to a competitive market serving the consumers' interests.

For the immediate future, administrations can act to help overcome the difficulties encountered in the physical deployment of networks by harmonising the conditions and speeding up the procedures applicable for the acquisition of base stations sites. In addition, they can foster efforts to improve public awareness on safe usage of mobile equipment.
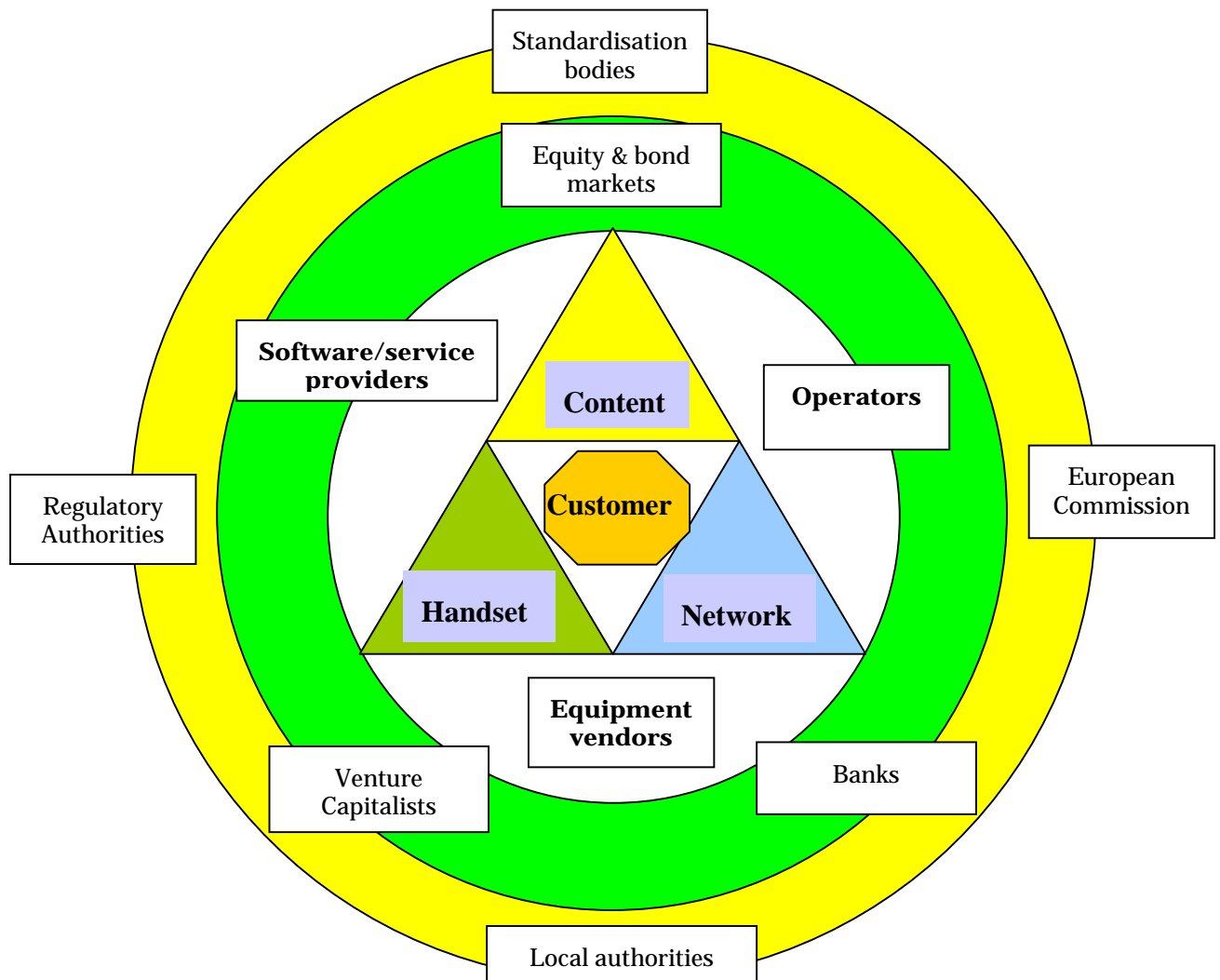
In the longer run, the lack of harmonisation in licensing conditions and assignment across the European Union for 3G may represent a hindrance to integration in the Internal Market for telecommunications and may cause market distortions and uncertainty in the sector. This must be avoided as much as possible in the future, especially taking into account that new countries will shortly join the EU.

The Commission intends to use the new regulatory framework in electronic communications to work together with the national administrations to develop new harmonised approaches to licensing and attribution of rights to use radio spectrum for new 3G licences and for other wireless applications.

Until the market reaches cruising speed, the take-up of 3G is a continuous process which requires and deserves continued attention by public authorities. There are no simple answers to the challenges ahead, but 3G has developed sufficient momentum to overcome the present difficulties. The Commission remains confident in this respect.

ANNEX 1

3G – a schematic overview

Standardisation bodies

Equity & bond markets

Software/service providers

Operators

Content

Regulatory Authorities

European Commission

Customer

Handset

Network

Equipment vendors

Venture Capitalists

Banks

Local authorities

ANNEX 2

GLOSSARY

ARPU	Average Revenue Per User
CEPT	Conférence Européenne des Postes et Télécommunications
EMF	Electro Magnetic Fields
GPRS	General Packet Radio Service
GSM	Global System for Mobile communications
IP	Internet Protocol
IST	The Information Society Technologies programme in the European Union
MP3	Compression standard for audio
NIS	Network Infrastructure Sharing
OMA	Open Mobile Architecture
PDA	Personal Digital Assistant
RTD	Research and Technological Development
SMS	Short Messaging Service
TMT	Telecoms, Media, Technology
UMTS	Universal Mobile Telecommunications System
WRC	World Radiocommunications Conference
2G	GSM (in Europe)
2.5G	GPRS and EDGE (in Europe)
3G	Systems and services based on the ITU IMT-2000 family of standards
3GPP	Standardisation initiative called the 3rd Generation Partnership Project