



COMMISSION OF THE EUROPEAN COMMUNITIES

Brussels, 20.3.2001  
COM(2001)141 final

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

**The Introduction of Third Generation Mobile Communications in the European Union:**

**State of Play and the Way Forward**

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## EXECUTIVE SUMMARY

At a moment when 11 out of 15 Member States have issued 3G licenses and as the first 3G networks are about to be rolled out, the Communication briefly takes stock of the situation and identifies in particular four critical layers which may impact on the successful deployment of 3G services over the forthcoming years:

- The regulatory environment
- The financial context
- Gaining experience with the new market
- Outstanding technical issues

The Communication confirms the confidence the Commission has in the 3G market perspectives, while recalling the underlying policy objectives in terms of building the Information Society, capitalising on the success of 2G, securing jobs, and preserving and expanding the lead the European Union has on mobile communications in terms of technology development, competitiveness and service deployment.

To overcome possible difficulties, the Communication proposes action lines which could help easing the transition from 2G to 3G. The measures relate to the improvement of the regulatory environment, tackling pending technical issues and supporting the development of innovative wireless applications and content offers as well as ensuring a continuous R&D effort in the sector at Community level.

## **1. INTRODUCTION**

By the beginning of the year 2001, 63% of EU citizens had a mobile phone, the overwhelming majority of them (235 million) subscribing to GSM<sup>1</sup> services. The EU telecommunications services market is now worth over €200bn with an annual growth rate of 12.5%. Mobile communications, which increased by some 38% in 2000, already account for about 30% of the total revenues of the telecom services sector in the EU. The EU has thus become the world leader in mobile communications and its equipment manufacturers and operators are amongst the sector's most innovative and fastest growing companies.

In Europe, the "first generation" of analogue mobile systems was followed by GSM (so-called 2G). Now the "third generation" of mobile communications (3G) is coming, combining wireless mobile technology with high data transmission capacities. 3G systems promise access to Internet services specifically tailored to meet the needs of people on the move, via multimedia applications using image, video, sound as well as voice. The convergence intrinsic to 3G of the two main technological trends of recent years, the Internet and mobile communications, is thus bound to be of great social and economic importance to the European Union.

The success of GSM led to sustained efforts by all concerned to prepare for a coordinated and coherent deployment of third generation networks and services in the EU. This has involved the development of a common technology platform (UMTS, part of the ITU recommendation for IMT-2000, the 3G family of standards), the harmonisation of the radio spectrum and the definition of the regulatory environment. Today, the EU possesses the technological know-how and the equipment manufacturing capability necessary to launch 3G successfully. In addition, the dynamism of the 2G mobile market has favoured the emergence of large pan-European network and service operators capable of engaging in 3G on a large scale.

The present document does not aim to cover the full range of topics related to the introduction of advanced mobile data service in the EU, such as the social implications, the protection of users or the legal issues relating to content. It focuses instead mainly on some regulatory and technical issues critical to the success in the EU of 3G technology, the system which will allow the introduction of these new services. Finally, the document proposes several actions to address these issues at Community level.

## **2. STATE OF PLAY ACROSS THE EUROPEAN UNION**

The deployment of 3G networks across the European Union is expected to start within the next few months, with initial commercial services anticipated to become available and gradually expand in the course of 2002.

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<sup>1</sup> A definition of the acronyms found in the text is in the glossary (annex 1)

At this particular point in time, when the majority of Member States have granted 3G licenses, four issues deserve a closer monitoring, as they will critically influence the future of 3G:

- The regulatory environment
- The financial context
- Gaining experience with the new market
- Outstanding technical issues

## 2.1. The regulatory environment

**In the Community, the regulatory conditions for a harmonised introduction of the new mobile system are based on existing legislation governing licensing conditions.** In addition, a Community Decision<sup>2</sup> defines the capabilities of the new 3G services, calls for harmonised spectrum use and sets out a time frame for Member States to prepare their authorisation systems by January 1<sup>st</sup>, 2000. This time limit, agreed by all parties, was considered essential to enable those market players wishing to engage in this new market to have a co-ordinated and progressive introduction of commercial 3G services by January 1<sup>st</sup>, 2002, if they so wished.

Under this regulatory framework, it is the **responsibility of each Member State to determine the mechanism for spectrum licensing and to define the licensing conditions applicable on its territory.** Member States must follow certain principles laid down in the EU legislation<sup>3</sup> requiring licences to be granted through open, non-discriminatory and transparent procedures, based on objective criteria defined in advance.

**Eleven Member States<sup>4</sup> have already issued 3G licences, corresponding to 48 licensed networks.** These countries cover nearly 90% of today's 2G (GSM) market. **Licensing conditions vary greatly across these Member States** (see Annex 2). Different selection procedures have been used: auctions, comparative selections, or a mixture of the two. The number of licences proposed in each country varies from 4 to 6, while the charges for the licences normalised on the population of each country average between 0 € and about 650 € per inhabitant. Licences have varying duration and enter into force at different moments. Deployment conditions (legal coverage requirements and network-sharing conditions) also differ considerably. The spectrum

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<sup>2</sup> Decision No 128/1999/EC of the European Parliament and of the Council of 14 December 1998 on the co-ordinated introduction of a third-generation mobile and wireless communications system (UMTS) in the Community (OJ L 17, 22.01.1999, p. 1).

<sup>3</sup> Directive No 13/1997/EC of the European Parliament and of the Council of 10 April 1997 on a common framework for general authorisations and individual licences in the field of telecommunications services

<sup>4</sup> As of 20 March 2001: Austria, Belgium, Germany, Italy, Finland, France (licences not formally issued, two 3G licence applicants), Netherlands, Portugal, Spain, Sweden, United Kingdom.

assignment per operator is not harmonised. Finally, access conditions to 2G mobile networks (e.g. national roaming) are not treated equally.

Such fragmented conditions will inevitably create distortions in the way 3G networks and services will be implemented throughout Europe. The development of the market in each country could be affected by the effects of diverging licensing conditions between EU Member States, to the extent that the costs and timing of licences granted in other countries may influence pan-European operators in their decision on possible entry in a national market.

## 2.2. The financial context

**So far, total charges collected for licences amount to over 130 bn €<sup>5</sup>. Operators may face at least comparable costs for the deployment of new networks and for marketing of new 3G services.** Overall, the sector is thus burdened with very heavy front-end expenses.

In order to finance the investments required for 3G (as well as the on-going global consolidation in the sector), operators have largely turned to the **financial markets**. The resulting simultaneous demand for external funds and the high debt of most telecom operators have in several cases led to a down-grading of credit ratings and to substantial interest rate spreads. In turn, this deteriorating credit-worthiness has weighed upon the operators' market capitalisation, thus further affecting their ability to fund needed investments.

All these difficulties are not exclusive to 3G, but coincide with a bout of global **uncertainty in TMT stocks**. Since the dawn of mass access to the Internet, fostered by the availability and user-friendliness of graphical World Wide Web browser software, this sector has seen its market evaluation rise sharply, with a peak in Spring 2000. However, since then, there has been a prolonged downturn in the market for these stocks.

Since the Summer of 2000, **the interest in 3G licences has diminished in Europe, as operators or potential new entrants have re-assessed the risks associated with 3G**. The pending licensing procedure in France for instance has attracted only two operators for four licences. Similarly, in Belgium only three operators applied for four licences. The commercial value of 3G spectrum (as illustrated by the amount operators are willing to pay) has thus significantly decreased after the UK and the German auctions of last year.

The readjusted financial outlook for the sector could have implications for the development of a competitive market, since the financial burden will weigh particularly heavily on new entrants who do not yet have established networks and a presence on the market. Similarly, the heavy front-end expenses could negatively affect the investment foreseen for the development of new 3G services, weakening the growth of a large consumer base.

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<sup>5</sup> Total cost of licence charges excluding licence fees covering administrative costs, including the two licences most likely to be issued in France and the revised charges in Spain.

### 2.3. Gaining experience with the new market

The **market for new 3G services remains largely untested**, so far, although there are indications that **new mobile data services could rapidly generate strong market demand**. This is evidenced by the strong uptake of novel wireless data services in Japan and by the exponential growth of SMS messaging in Europe, which already accounts for 10% of the revenues of some 2G operators. **It is vital for all interested parties** (equipment manufacturers, operators, service providers and consumers) **to gain experience with new data-based wireless applications**. In this context, European GSM operators and service providers are already making use of WAP (wireless application protocol) to launch innovative services. Although the initial uptake of WAP services has not fulfilled all expectations, it has provided useful consumers' feedback to the whole industry in terms of marketing strategy, service creation and design aspects.

**The announced migration towards the so-called "2.5G" service range is expected to increase the adoption of creative new wireless data service in the EU**. Many operators have already upgraded their GSM networks to provide **GPRS services**, which offer an "*always on*" function (packet-switched mode) and which allow for data transfer rates intermediate between today's GSM networks and future 3G networks. An additional evolution option, referred to as EDGE, is also under consideration, providing even greater data transfer rates.

**The launch of 2.5G services may prove to be a crucial step for the satisfactory uptake of 3G** by allowing a phased market development and the extensive testing of "3G-like" applications, thus offering reliable insights into the future market for true 3G services and building up an initial customer base via relatively limited network upgrade investments on existing GSM networks.

### 2.4. Outstanding technical issues

**The timely availability of 2.5G and 3G handsets will be crucial**. The delivery of large quantities of GPRS terminals is still pending, contributing to the delays in the offer of 2.5G services. Product development for 3G terminals has not in the main progressed beyond prototyping, pending verification of the key applications which these handsets will need to serve. Similarly, the (2G-3G) dual-mode terminals required in the context of roaming outside the initial coverage area of 3G are still at the design and early testing stages.

**The high investments made by operators to acquire 3G licences makes the rapid installation of reliable and stable network equipment a critical factor**. With nearly 50 network operators intending to launch their networks within a relatively short period, equipment delivery bottlenecks could occur and lead to distorting effects between operators. In addition, this peak demand can be expected to lead to higher prices than in a phased introduction.

A first set of specifications allowing manufacturers to build terminals and network elements for 3G is ready, based on GSM network technology (3GPP release 99). However, some operators favour the implementation of a **fully Internet Protocol-compatible solution**, allowing for full multimedia capabilities.

The current implementation of the Internet Protocol (version 4, IPv4) is considered to limit the full deployment of 3G services in the long run. The proposed new IP version (IPv6) would overcome this addressing shortage and enable additional features, such as guaranteed quality of service and security. Implementing IPv6 mobile networks will also allow for wireless machine-to-machine interconnection, thereby considerably boosting the application of 3G. Any delay in the transition to all-IPv6 networks, which will require several years of effort, risks hindering the deployment of these advanced 3G service features at a later stage.

### 3. RECALLING THE POLICY OBJECTIVES

The main **responsibility for the success of 3G in Europe lies with the industry itself**. The success of 3G and of the “wireless Internet” will depend first and foremost on the delivery of services that the public want to use at prices they can afford. Nevertheless, the successful development of new mobile services has **clear policy implications for the European Union**.

**One of the EU key policy objectives is to bring all Europeans into the information society by advancing the take-up of Internet services<sup>6</sup>**. While mobile penetration rates in the EU reach 63%, fixed Internet penetration rates are rather lower (28% of households connected)<sup>7</sup>. **A rapid and smooth deployment of 3G services in Europe will enhance the achievement of this objective**. Whilst regulation (such as the unbundling of the Local Loop<sup>8</sup>) or the take-up of other technologies (e.g. interactive TV or fixed satellite services) can also make important contributions to increasing overall Internet access rates in the EU, 3G will be essential to provide access to advanced Internet-like data services, adapted to the different environment of use (mobility-specific, location-based and time-dependent data).

**3G will also have a significant impact on job creation in the European Union**. Since 1996, the GSM sector has **created** some 445,000 jobs in Europe, and the cumulative volume of investment in GSM up to now amounts to some 70bn €<sup>9</sup>. The introduction of 3G services also presents a high potential for job creation beyond the mobile sector (Internet content providers, m-commerce, e-banking and financial services ...).

**There is today a concrete opportunity for the frequencies and technologies used for wireless communications to converge globally**. 3G will be introduced in Japan in May 2001, on the basis of licenses granted without charge, while the US government has recently undertaken efforts to select and auction spectrum for 3G in conformity with international standards<sup>10</sup>. Other countries are moving towards

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<sup>6</sup> *eEurope 2002 Action Plan*”, prepared by the Council and the European Commission for the Feira European Council of the 19-20 June 2000, (Brussels, June 14<sup>th</sup>, 2000)

<sup>7</sup> It is a matter of concern that this figure hides very wide disparities in the EU, from 54% household penetration in the Netherlands to 11% in Greece. (*source: Eurobarometer, 10/2000*).

<sup>8</sup> Regulation of the European Parliament and of the Council on Unbundled Access to the Local Loop (adopted by Council on December 5th, 2000).

<sup>9</sup> Source: GSM Association, 2001

<sup>10</sup> As specified in the Executive Memorandum by President Clinton of October 13<sup>th</sup>, 2000. However, the US have still to identify initial 3G frequency bands and operating conditions.



implementing 3G systems. **A prompt introduction of 3G services will support European competitiveness and leadership in this sector and will promote the global convergence of new mobile electronic communications systems.**

#### **4. ACTIONS TO BE TAKEN AT EU LEVEL**

The cost of low degree of harmonisation of licensing methods and conditions has become evident in the on-going 3G licensing round. The apparent distortions to the European single market for mobile communication services call for EU level action.

- First, while making future wireless services a commercial success is a task for private enterprises, it is the responsibility of the Community to ensure that the right regulatory conditions are in place for the future.
- Secondly, co-ordinated action in support of future wireless services can be offered via the existing Community policies such as research programmes and the *e*Europe Action Plan.
- Thirdly, there are newly emerging regulatory issues related to the present licensing round - which is carried out under existing legislation - that may yet increase fragmentation, if action is not taken.

##### **4.1. Getting the future regulatory framework right**

Member States have traditionally preferred minimal solutions in terms of harmonisation of the licensing of telecommunications services. In particular, this has been the case for services that require use of radio spectrum.

The Commission proposed in July 2000 a legislative package for a new regulatory framework for all electronic communications services<sup>11</sup>. One of the aims of the proposed legislation is to require that national authorities consult each other prior to licensing so as to ensure consistency in the licensing methods and conditions for services that are offered by operators in several parts of the Single Market.

Under the proposed Framework Directive<sup>12</sup>, the measures related to the use of radio spectrum envisaged by a Member State would have to go through a consultation process with the competent authorities of other Member States and the European Commission. The Commission would retain the ultimate power to require a Member State to amend or withdraw the proposed measure if it were in contradiction with the policy objectives of the new framework. The new legislation would also allow for secondary trading of radio spectrum, which should provide for increased flexibility of use of this scarce resource.

Furthermore, the Commission proposed a Decision on a regulatory framework for radio spectrum policy. This Decision would provide for a Community level policy platform for addressing all issues related to the use of radio spectrum. It foresees a

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<sup>11</sup> The legislative proposals are currently in the first reading of co-decision between the European Parliament and the Council.

<sup>12</sup> Proposal for a directive of the European Parliament and of the Council on a common regulatory framework for electronic communications and services, COM(2000)393, July 12<sup>th</sup>, 2000.

mechanism to harmonise the allocation, assignment and conditions of use of radio spectrum for all non-military purposes (notably telecommunications, transport, broadcasting and research) in the EU. The Member States and the Commission would be able to discuss in a structured and organised manner issues such as advantages of different spectrum assignment methods (auctions and selective procedures) and conditions attached to licences. This decision would cover all Community policy sectors, which rely on the use of radio spectrum.

The Commission is confident that these measures would help to reduce the differences in licensing procedures and licensing conditions in the future, and thus to avoid such fragmentation that is happening now.

Finally, in addition to licensing, the proposals include other elements that are important for the success of future wireless services. Avoiding excessive ex ante regulation for example in terms of price control is important in this sector which requires enormous investments. Raising the threshold of regulatory intervention and the increasing reliance on Competition law are important in creating a suitable environment for investment.

The European Council of Lisbon called on the Community institutions to adopt this legislative package by the end of 2001.

#### **4.2. The European Research Area and eEurope in support of future digital wireless services**

Private industry, Member States and the Community need to **maintain a high level of research in wireless technologies** to ensure the development of technologies beyond 3G. In terms of budget, the Community Framework Programmes are relatively small compared with national and private sector RTD budgets. But they provide important platforms for collaborative, pre-competitive research in information technologies. The Commission proposed in February 2001 to strengthen the importance of mobile and wireless communications in its proposal for the 6<sup>th</sup> Framework Programme for research and technological development<sup>13</sup>.

The data services that 3G will provide for users are a key for its success. Mobile Internet services will be location based, personalised and increasingly user friendly. **It is essential that appealing multi-lingual and culturally customised European content is developed both for individual users and businesses.** Again, production of digital content is primarily a matter for private enterprises. But there is also a case for EU-level action to provide incentives for the creation of multi-lingual, European content. Information held by public authorities (e.g. geographic information, traffic data) is a valuable source for the creation of value-added data services. Overcoming the barriers for its exploitation is becoming increasingly important. Furthermore, offering public sector on-line services in a format suitable for access by mobile terminals would be an important addition to 3G service offerings. The eEurope 2002 Action Plan<sup>14</sup> and its eContent programme adopted by the Council and the European

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<sup>13</sup> Proposal for a Decision of the European Parliament and of the Council concerning the multiannual Framework Programme 2002-2006 - COM (2001) 94 Final – February 21<sup>st</sup>, 2001

<sup>14</sup> eEurope 2002 Action Plan, prepared by the Council and the European Commission for the Feira European Council of June 19<sup>th</sup>-20<sup>th</sup>, 2000 (Brussels, June 14<sup>th</sup>, 2000)

Parliament<sup>15</sup> provide a Community level platform for stimulating European content creation.

Full potential of 3G services cannot be exploited without the gradual **introduction of the new Internet Protocol (IPv6)**. A fully-fledged mobile Internet, where each mobile terminal will have an Internet address requires a much larger address space than the current IPv4 can cater for. In time, Europe risks to run out of Internet addresses if co-ordinated action is not taken now. The European Commission will invite Member States to work together with industry in an *ad hoc* group, which should provide proposals by the end of 2001 to accelerate the introduction of IPv6. The Commission will also increase support for test beds through its IST and TEN Telecom programmes.

### 4.3. Facilitating deployment of 3G networks under current legislation

The attribution of the 3G licences granted until now in the EU has been done on the basis of the existing Community and national law, and it is not the intention of the Commission to question *a posteriori* the validity of these licences, as long as they have been granted according to Community legislation. Furthermore, the Commission will continue to apply and enforce competition rules in the mobile communications sector.

However, a number of important regulatory issues related to the current licensing round are now emerging as a consequence of the increasingly heavy financial burden on the telecom operators. Most of the issues are common to all Member States and national authorities are faced with the same type of questions. There is a risk of a yet increased fragmentation of the regulatory environment in the EU, unless common European approaches are sought.

Therefore, the Commission intends to launch without delay, within the scope of legislation in force<sup>16</sup>, a dialogue with the Member States and the operators and equipment manufacturers, in order to explore concrete means to facilitate deployment of 3G networks and services. The issues to be addressed include *inter alia*:

- legal treatment of delays in 3G deployment with respect to deployment obligations, licence duration and the impact of simultaneous roll-out requirements in several Member States.
- conditions to be met in order to permit network infrastructure sharing, which the Commission considers in principle positively due to its potential economic gains, on the condition that the competition rules and the provisions of other relevant Community law are respected.
- flexibility for licensed operators to choose the technical platform to deliver wireless services.

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<sup>15</sup> Council decision adopting a Multiannual Community programme to stimulate the development and use of European digital content on the global networks and to promote the linguistic diversity of the information society, 2001/48/EC, January 18<sup>th</sup>, 2001.

<sup>16</sup> See especially the article 8.4 of the Directive 13/97/EC which spells out the conditions under which licence conditions may be changed.

- how to deal with radio spectrum left unused after the first round of issuing 3G licences and the organisation of subsequent licensing rounds.
- issues of provision and acquisition of base station sites, such as those related to the environment and to electromagnetic emissions.

The results of such a dialogue will be useful not only in view of finding immediate solutions for 3G services. They may also help in defining future licensing modalities with the aim to minimise the negative effects of fragmentation in the future and to tackle the issues related to the organisation of further licensing rounds<sup>17</sup>.

Finally, it is important to support the acceleration in the definition of technical specifications for 3G currently underway in the context of 3GPP<sup>18</sup>, notably the new releases of specifications allowing for full multimedia capability. Once these releases are agreed, action should be taken to encourage the testing of new specifications (for instance, by financing pilot projects) in order to make them available on the market as quickly as possible.

## 5. CONCLUSIONS

**The Commission recalls the great economic and societal potential that future wireless services will offer.** Despite the current uncertainties of the markets, it should not be forgotten that 3G is built on very strong foundations and that in the foreseeable future it is the only viable, widely supported common platform for all broadband mobile Internet applications. 3G will offer users a new quality of wireless services based on global roaming capability: personalised services, mobile data transmission, transaction services and location-based services. For these reasons, all concerned actors need to work together to tackle outstanding issues and concerns raised by the introduction of wireless data services in the European Union.

The EU needs to continue fostering conditions which will enable future digital mobile services to thrive. The main task of the EU institutions is to prepare a suitable regulatory environment which allows for the necessary degree of European harmonisation and ensures the regulatory certainty on which the future 3G players can build their business cases. For this purpose, the Commission proposed a new Regulatory Framework for electronic communications and a Regulatory Framework for Radio Spectrum Policy. It is crucial that these regulatory initiatives be adopted and implemented as soon as possible.

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<sup>17</sup> These include further licensing rounds in Member States in order to assign the additional radio spectrum identified at WRC-2000 for IMT-2000 applications. Additional spectrum will be needed between 2005 and 2010 to accommodate the expected increase of the 3G traffic.

<sup>18</sup> The 3<sup>rd</sup> Generation Partnership Project is an international standardisation initiative originally founded by ETSI (Europe), ARIB (Japan) and T1 (USA).

## **ANNEX 1: GLOSSARY**

<b>EDGE</b>	Enhanced Data for GSM Evolution
<b>GPRS</b>	General Packet Radio Service
<b>GSM</b>	Global System for Mobile communications
<b>IMT-2000</b>	International Mobile Telecommunications 2000
<b>IP</b>	Internet Protocol
<b>IST</b>	the Information Society Technologies programme in the European Union
<b>ITU</b>	International Telecommunications Union
<b>RTD</b>	Research and Technological Development
<b>SMS</b>	Short Messaging Service
<b>TEN</b>	Trans-European Networks
<b>TMT</b>	Telecoms, Media, Technology
<b>ULL</b>	Unbundling of the Local Loop
<b>UMTS</b>	Universal Mobile Telecommunications System
<b>WAP</b>	Wireless Application Protocol
<b>WRC</b>	World Radiocommunications Conference
<b>1G</b>	Analogue mobile systems
<b>2G</b>	GSM (in Europe)
<b>2.5G</b>	GPRS and EDGE (in Europe)
<b>3G</b>	Systems and services based on the ITU IMT-2000 family of standards
<b>3GPP</b>	Standardisation initiative called the 3 <sup>rd</sup> Generation Partnership Project

**ANNEX 2: Overview of 3G Licensing in the Member States (at 20 March 2001)**

Member State	Attribution of licence	Status	Date	Number of licences (Incumb.ts)	Total price paid for licences	Duration of licences	Population coverage obligation	Frequencies per licence (in MHz) paired - unpaired	Roaming 2G/3G
<b>Austria</b>	auction	<b>done</b>	11/00	6 (4)	€0.83bn	20 years from license award	25% by 31.12.2003 50% by 31.12.2005	12 packages of 2x5 MHz, and 5 pack. of 1x5 MHz.	yes
<b>Belgium</b>	auction	done	03/01	4 (3) 3 licenses attributed	€450.2M  (for 3 licences)	20 years	30%>3 ys; 40%>4yrs; 50%>5 ys; 85%>6yrs.	2 x 15 + 5 equally.	yes
<b>Denmark</b>	auction	pending	10/2001	4-6 (4)	tbd	tbd	tbd	tbd	tbd
<b>Finland</b>	comparative bidding	<b>done</b>	3/99	4 (3)	€1000 per 25 KHz license admin. fee	network license: 20 yrs freq. lic. 10 yrs renewable	no specific obligation, but Ministry to ensure implementation of licenses.	2 x 15 + 5 equally – leaves 15 MHz.	yes
<b>France</b>	comparative bidding + payment	under way	7/01	4 (3) 2 licences to be issued	€ 9.8bn + admin. fees (for 2 licences)	15 years	voice: 25%>2 yrs; 80% >8 yrs; Data: 20%>2yrs; 60%>8yrs.	2002: 2x40 paired; 1.1.2004: 2x60 + 20 equally.	yes
<b>Germany</b>	auction	<b>done</b>	8/00	6 (4)	€50.8bn	20 years	25% end 2003; 50% by end 2005	5 licences with 10MHz paired + 5MHz unpd.; 1 lic. With 10MHz p.	possible no obligation
<b>Greece</b>	auction	pending	mid-2001	4 or more(3)	tbd	tbd (15-20)	tbd	tbd	tbd
<b>Ireland</b>	comparative bidding	pending	4/01	4 (3)	tbd	tbd (15 to 25 yrs)	tbd	tbd	tbd
<b>Italy</b>	auction	<b>done</b>	10/00	5 (4)	€14.64bn	15 years	7.2004: regional capitals; 1.2007: main provincial towns.	2 licences with 2 x 15 + 5 and 3 licences with 2x10MHz + 5	yes
<b>Luxembourg</b>	comparative bidding	pending	By 6/01	4 (2)	tbd	tbd	subject to market development.	tbd	tbd
<b>Netherlands</b>	auction	<b>done</b>	7/00	5 (5)	€2.68bn	until end 2016	1.1.2007: cities > 25,000 inh. + main	2 licences: 2 x 15 + 5	in principle

Member State	Attribution of licence	Status	Date	Number of licences (Incumb.ts)	Total price paid for licences	Duration of licences	Population coverage obligation	Frequencies per licence (in MHz) paired - unpaired	Roaming 2G/3G
							comm. points.	3 licences: 2 x 10 + 5	yes (
<b>Portugal</b>	comparative bidding	<b>done</b>	11/00	4 (3)	total min. €400M + annual fee.	15 years	20% >1yr; 40% <3yrs; 60% >5yrs.	2 x15 + 5 equally.	yes
<b>Spain</b>	comparative bidding + payment	<b>done</b>	3/00	4 (3)	€520M + yrly tax + admin. Fees over 20 years:14.1bn €	until 8.2020; 10 yrs extendable	1.8.2001: cities > 250,000 inh.	2 x 15 + 5 equally; progressive freeing.	yes
<b>Sweden</b>	comparative bidding + payment	<b>done</b>	12/00	4 (3)	total €46.800 + 0.15% annual fee.	15 years (network license)	selection criterion.	2 x 15 + 5 equally; new entrants (2 max.) receive GSM Freq. (900 & 1800)	access to GSM spectrum
<b>United Kingdom</b>	auction	done	4/00	5 (4)	total €38.475bn	until 31.12.2021	80% pop. by end 2007	A: :2x15 + 5. B: 2x15 paired C,D,E: 2x10 + 5	yes