



European Radiocommunications Committee (ERC)  
within the European Conference of Postal and Telecommunications Administrations (CEPT)

**REVIEW of PMR FEES**

**The Hague, February 2001**



## INDEX TABLE

<b>1</b>	<b>INTRODUCTION.....</b>	<b>1</b>
<b>2</b>	<b>THE DRAFT DIRECTIVES BASED ON THE 1999 COMMUNICATIONS REVIEW.....</b>	<b>1</b>
<b>3</b>	<b>CONCLUSIONS OF THE ERO STUDY ON PMR AND PAMR LICENSING, JULY 1997.....</b>	<b>2</b>
<b>4</b>	<b>CONCLUSIONS OF ERC REPORT 73 ON INVESTIGATION OF THE POSSIBILITIES OF HARMONISING (LICENSING AND FEES FOR) THE PMR SERVICE WITHIN CEPT ADMINISTRATIONS, APRIL 2000.....</b>	<b>2</b>
<b>5</b>	<b>REGULATORY SITUATION WITH REGARD TO PMR.....</b>	<b>2</b>
5.1	COSTS OF PMR NETWORKS: INVESTMENT FOR INFRASTRUCTURE.....	3
5.2	NETWORK COSTS VERSUS LICENSING COSTS.....	4
5.3	CURRENT LICENSING SYSTEMS FOR PMR.....	5
<b>6</b>	<b>OPTIONS FOR PRICING AND THE POSSIBLE IMPACT ON PMR FEES.....</b>	<b>5</b>
<b>7</b>	<b>PMR FEES IN CEPT COUNTRIES.....</b>	<b>7</b>
<b>8</b>	<b>SHORT TERM USE OF PMR.....</b>	<b>8</b>
<b>9</b>	<b>MARKET DEVELOPMENTS IN THE PMR AREA.....</b>	<b>8</b>
<b>10</b>	<b>VIEWS OF INDUSTRY.....</b>	<b>8</b>
<b>11</b>	<b>CONCLUSIONS AND PROPOSALS.....</b>	<b>9</b>
11.1	DIFFERENCES IN CHARGING SYSTEMS.....	9
11.2	PROPERTIES OF PMR IN RELATION TO FEES.....	11
11.3	LEVEL OF FEES AND DIFFERENCES IN FEES.....	11
11.3.1	<i>Level of fees.....</i>	<i>11</i>
11.3.2	<i>Differences in fees.....</i>	<i>11</i>
11.4	FEES AND DEMAND.....	12
11.5	ATTENTION FOR THE SUBJECT OF FEES.....	12
11.6	PROPOSALS.....	13
<b>ANNEX I</b>	<b>Example PMR fees.....</b>	<b>14</b>
<b>ANNEX II</b>	<b>Fee Policies in different countries.....</b>	<b>21</b>
<b>ANNEX III</b>	<b>Analysis of its cost structure for PMR by the Swiss administration.....</b>	<b>32</b>



## PMR FEES

### 1 INTRODUCTION

The question, whether the fees that have to be paid in order to operate a PMR network are reasonable or not in relation to other services has been raised already a number of times by the European manufacturers and users. The same can be said about the question why these fees are so different in the CEPT countries.

These questions on fees and charging are part of a broader set of issues in the PMR area that attract attention at the moment. Other issues are the licensing issues, such as the time it takes to get a licence as well as the procedures surrounding this process and the question whether there are enough frequencies available for PMR.

The European Commission has taken an interest in these PMR issues. This led to the request to the ERO to produce studies on the PMR licensing and charging issues as well as the frequency issues<sup>1</sup>. As a follow-up of these studies the Licensing Committee, the Committee established under the Licensing Directive, requested the ERC to address the frequency, licensing and pricing issues relating to the PMR sector and to come up with solutions. With regard to fees and administrative costs the 1999 Communications Review of the European Commission<sup>2</sup> and the draft Directives based on this review as published in July 2000,<sup>3</sup> concluded that the national fee levels are not transparent and proposed among other things to develop guidelines or recommendations on fee levels and administrative procedures.

Within the Working Groups of the ERC the above mentioned ERO reports have been studied, with the aim to come to a common understanding and ideas in order to arrive at a co-ordinated approach on PMR within CEPT by way of adequate ERC output documents, such as ERC Decisions, Recommendations or Reports.

In the area of frequency harmonisation this has led to the development of a strategic plan for PMR Spectrum Use in Europe.

In the area of licensing, this has led to the adoption of ERC Report 73 on Investigation of the possibilities of harmonising (licensing and fees for) the PMR service within CEPT Administrations. In that Report information on the different fees for PMR in the CEPT is collected. However, the development of conclusions as well as proposals that could lead to guidance to administrations or common understanding of fee setting was left for further study in a separate Report on PMR fees.

The current ERC Report provides to resolve these issues left open by ERC Report 73.

In ERC Report 73 and also this Report, PMR is taken to mean self provided, self used or closed user group mobile radio systems - i.e. Professional Mobile Radio. PMR is part of the land mobile service based on the use of simplex, half and possibly full duplex at the terminal level in order to provide closed user group communications. Citizens Band –CB (e.g. PR 27) or paging are not part of PMR.

The ERO study on PMR and PAMR licensing gives the following explanation of PAMR: the term PAMR means Public Access Mobile radio. PAMR is basically a PMR radio system with a private operator (the „service provider“) providing a radio service to a closed user group or a number of closed user groups.

### 2 THE DRAFT DIRECTIVES BASED ON THE 1999 COMMUNICATIONS REVIEW

The Electronic Communications Directives, mentioned in the introduction, including the Framework and Authorisation Directives currently being negotiated, will establish a new framework for setting fees for authorisation of radio frequency use. Whilst the Directives are aimed to provide a framework for public communications networks, or those provided for remuneration, they would certainly include PAMR and may also cover many PMR networks too. As it is difficult to define what a service provided for remuneration is meant to include, it is suggested that careful account be taken of them for all

---

<sup>1</sup> ERO Reports: PMR and PAMR licensing July 1997, PMR in Europe, a general overview December 1998, PMR Market and Spectrum Requirements December 1998.

<sup>2</sup> Towards a new framework for Electronic Communications infrastructure and associated services COM (1999)539

<sup>3</sup> In particular the Proposal for a directive of the European Parliament and of the Council on a common regulatory framework for electronic communications networks and services and the Proposal for a directive of the European Parliament and of the Council on the authorisation of electronic communications networks and services.

PMR services. The Directives are likely to come into force late 2002 or early 2003. They would apply to all new services from the outset, and existing authorisations will be expected to comply after a short period.

A key principle proposed for EU Member States is that a general authorisation for a type of service should apply wherever possible, and this could cover PMR light regime services (replacing exemptions) operating on harmonised spectrum. Member States may charge an overall administration fee to larger undertakings (proportionate to turnover) to help cover costs, but is expected that small companies (turnover of less than EUR 10 million is suggested) would be exempt from any fee. Where radio spectrum is in demand, the package proposes that the services should have a specific authorisation (i.e. a licence), provided its terms are limited to those factors concerned with spectrum management or other specific factors such as national security or environment.

Member States would be free to authorise licences by auction award or may charge by spectrum administrative pricing for specific authorisations to reflect the need to ensure the optimal use of these resources, provided such fees are transparent, objective and proportionate. The fees may also be used to develop innovation and competition.

**General acceptance of the Directives was achieved in the April 2001 Telecommunications Council meeting, but the package has still to clear the remaining Parliamentary stages.**

### **3 CONCLUSIONS OF THE ERO STUDY ON PMR AND PAMR LICENSING, JULY 1997**

In this chapter and the following chapter the most relevant of the above mentioned earlier studies and Reports in relation to this current ERC Report are shortly summarised.

The ERO PMR/PAMR licensing study concluded that the costs for initial granting of the licence and the annual or periodic renewal fees vary significantly from country to country, as does the basis for arriving at the level of the charge. In a few countries the fees are so high that they might be considered to be a discouragement for the use of PMR, although in other countries they are reasonable or even low.

Another conclusion of the study was that PMR and PAMR licences constitute in many countries a major part of the income of the frequency management organisations. This implies that changes to the fees for these services will have a large impact on the income and will therefore not be so easy to realise. Another reason why these changes are considered to be difficult to realise is the fact that changes in the fee structure will in many cases only be possible to realise after a change in the Telecommunications Law, which is in many countries a long process.

### **4 CONCLUSIONS OF ERC REPORT 73 ON INVESTIGATION OF THE POSSIBILITIES OF HARMONISING (LICENSING AND FEES FOR) THE PMR SERVICE WITHIN CEPT ADMINISTRATIONS, APRIL 2000**

This ERC Report has presented an overview of the fees for five different PMR systems in 19 countries, which confirmed the conclusions from the ERO study that there is wide variation in the level of fees. (see **Annex I**) The Report gives some factors, (political, economical, social, geographical and technological) which might contribute to these differences and concludes that further work is needed in this area.

### **5 Regulatory situation with regard to PMR**

PMR has a long history attached to it. The first PMR radios were put into service just after the Second World War. The users were mainly government and emergency services. During the sixties the regulation in many countries within CEPT was changed in such a way that also commercial, business, industrial, agricultural and transport sectors could obtain licences. This led to a new market situation with the entry of new manufacturers to the market, competing for a market share. Customers enjoyed much-lowered prices, which again stimulated a rapid market growth.

Today the main users are public safety and security organisations (including police, fire and ambulance services), airports, seaports and railways, public utilities and industrial users who need a reliable means of communicating with personnel - and more especially *groups* of personnel - on the move, such as for instance taxi or ambulance companies. Systems vary between very simple on-site systems, with for instance no base station or a single base station to nation wide or nearly nation wide systems with a hundred base stations or more. The costs of operating such systems varies also from very low to very high.

Currently, the majority of the networks are of conventional type, i.e. that the basic configuration offers only one channel in one area. These networks can be either simplex (walkie talkie) or relayed. This situation is evolving because of the implementation and developments of various techniques:

- Trunking, which by grouping several channels on the same site, makes it possible to obtain at the same time an effective use of the frequencies and a good quality of service but which only works efficient when having a reasonably large number of users per network.
- Multi-site networks which manage roaming automatically and which can cover up to an entire country.
- Digital radio which brings confidentiality, a faster flow of data and a better quality of voice.

Digital trunked networks, combining these techniques, have appeared the last few years and are developing fast. They cover the needs for several user groups either in commercial networks (PAMR) or in private networks (PMR).

Another aspect of PMR is the introduction of PMR 446, which is licence free. For users who move around in a small area and who are satisfied with hand helds, this system offers a remarkably low cost solution.

Despite the rapid growth of cellular telephony and newer services such as mobile data networks, PMR is still the preferred communication system for applications where most traffic is between a control point and the mobile terminals, or where groups of mobile terminals must communicate on a 'one-to-all' basis. Moreover PMR offers unique services, which the basic cellular systems do not have: fast call set up, direct mode, priority and pre-emption, management of fleets and groups etc.

### 5.1 Costs of PMR networks: investment for infrastructure

With regard to costs for the users of the different networks, the following can be said: Public network costs are mainly based on aggregated call utilisation and so are highly unpredictable to the end user. On the other hand PMR and PAMR networks are based on fixed costs. For a PMR system this would be the cost of initial installation plus a regular maintenance cost (which is often subcontracted at a fixed nominal cost); in case of PAMR there would be a contractual cost commitment for a long period independent of the traffic generated.

Although a PMR system necessitates relatively high investments in terminals and infrastructure before the service can start, the total installation and operational cost of dedicated PMR systems is much lower than those for public mobile radio telephone networks over a period of several years. This is the same for PAMR systems, although based on a different cost structure (lower initial investment for the user).

As an example of investment and running costs of PMR networks, the costs of the same five networks that were used to compare the licence fees in the different CEPT countries (see **Annex I**) are calculated based on current prices in the UK. It should be noted that these costs are based on average prices.

Base station: 1500 pounds  
 Site costs base station: 1000  
 Mobile station: 150-250  
 Land line: 300 per line  
 Batteries, maintenance mobile: 50 per terminal per year  
 Electrical power: 300 per base station per year

**Example 1:** 5 hand portables only,  $5 \times 150 = 750$  pounds = **847 EURO**.

**Example 2:** 1 base station and 10 mobiles:  $1500 \text{ base} + 1000 \text{ site} + 10 \times 200 + 300 \text{ line} + 10 \times 50 \text{ batteries} + 300 \text{ electricity} = 4600$  pounds = **5194 EURO**.

**Example 3:** 1 base station controlling 1 repeater station at 10km distance with 30 mobiles operating over an area of approximately 15km radius around the repeater station using non-exclusive PMR spectrum:  $1500 \times 2 \text{ base} + 2000 \text{ site} + 30 \times 200 \text{ mobiles} + 300 \text{ line} + 30 \times 50 \text{ batteries} + 2 \times 300 \text{ electricity} = 13\,400$  pounds = **15 129 EURO**.

**Example 4:** A trunked network with 3 base stations with 400 mobiles using 3 exclusive channels over 10 square Km:  $1500 \times 3 \text{ base} + 3 \times 1000 \text{ site} + 400 \times 200 \text{ mobiles} + 2 \times 300 \text{ lines} + 400 \times 50 \text{ batteries} + 3 \times 300 \text{ electricity} = 109\,000$  pound = **123 061 EURO**.

**Example 5:** 20 base stations with 200 mobiles:  $20 \times 1500 + 20 \times 1000 \text{ site} + 200 \times 200 \text{ mobiles} + 20 \times 300 \text{ lines} + 200 \times 50 \text{ battery costs} + 20 \times 300 \text{ electricity} = 112\,000$  pound = **126 448 EURO**.

As can be seen from the examples the investment costs and running costs of a PMR network, particularly the larger networks, are considerable.

## 5.2 Network costs versus licensing costs

To the costs of the networks the licensing costs have to be added. As can be seen from **Annex I**, these differ and are in a number of cases and countries high, which could lead the suggestion that potential customers would be scared off, especially when the high fees are combined with tedious licensing procedures, and might lead to choosing other alternatives, which might not be the best choice for their communications requirements.

It would therefore be of use to see how the licensing costs relate to the above mentioned investment and running costs. It would also be interesting to know whether there is a correlation between the level of the PMR fees and the market penetration of PMR, in order to get an indication whether the high licence fees are a barrier for potential users.

With regard to the licensing costs in relation to the investment and running costs a comparison can be made with the figures in **Annex I** and the following figures are given. It should however be noted that the investment costs are those applicable in the UK, which might of course differ from those in some of the other countries.

	Investment costs	Licensing costs low fee country	%	Licensing costs medium fee country	%	Licensing costs high fee countries	%
Example 1	847	13	1.5	107	12.6	1 185	140
Example 2	5 194	18	0.3	200	3.8	1 894	36.5
Example 3	15 129	47	0.3	714	4.7	5402	35.7
Example 4	123 061	473	0.4	5000	4	54 576	44.3
Example 5	126 448	392	0.3	8570	6,7	68 602	54.2

As countries Denmark (low), UK (medium) have been chosen. In the examples with high fees different countries have been chosen, which had in the example the highest fee. The fees that have to be paid every year have been taken. The % are the % of the licensing costs in relation to the investment costs.

It can be concluded from this table that the licence costs are 0.5-5% of the total costs in those countries that have low or medium licence fees. In the countries that have high fees they are 35-140 % in relation to the total costs.

In The Netherlands and Switzerland and UK similar calculations have been made with the aim to investigate the steering effect of PMR fees. In The Netherlands this was done as part of a larger study on the introduction of Administrative Incentive Pricing.

The study in **The Netherlands**, performed by Price Waterhouse Coopers in 1999, investigated the possibilities for the introduction of Administrative Incentive Pricing for a number of services. With regard to PMR (taxi systems) the costs of the licences in relation to the equipment investment costs were calculated for small and big systems. Costs of licences varied between 10-30 % of the total cost of the equipment and the licence, depending on the size of the system. Via calculating prices for next best solutions for the PMR the consequences of the introduction of Administrative Incentive Pricing were investigated. Introduction of Administrative Pricing would raise the prices with a factor 8. Since the overall conclusion was that there was no frequency scarcity expected, it was decided not to introduce Administrative Pricing.

In **Switzerland** a short study was done on the PMR licensing fees in early 2000. The study investigated the price elasticity and the steering effect of the fees. The results were that low price elasticity was found. Licensees would accept a higher fee. It should however be taken into account that this only applies to licensees, „who have nowhere else to go“. Others, who have an alternative, might have turned away already. The fees were found to be 68-80% of the running costs at that time. Meanwhile fees have been changed and in many cases lowered in Switzerland..

Within the **UK** there was a study done by Quotient, ordered by the Radiocommunications Agency in preparation of the introduction of Administrative Incentive Pricing. This study investigated among other things the demand elasticity in case

of the introduction of pricing. The overall conclusion was that increasing licence fees by a factor of 2 or 3 would reduce demand by only a small percentage, since PMR is cost effective and has features not available with alternatives.

There has been a study done by the **Strategis group** on the correlation between the level of the PMR fees and market penetration in the different European countries

This study „European PMR/PAMR markets 1997“ contains an overview of the number of users in the different countries as well as the different labour market penetration figures of PMR and also PAMR. Conclusions are that the highest number of users are to be found in France, Germany, UK and Italy. The highest penetration of PMR in the labour force is in Austria, Denmark, Iceland, Malta, Sweden, Switzerland and UK. When ignoring Malta and Iceland, since the fee levels are not known there. It could be said that the fee levels of Austria, Denmark and Sweden are definitely one of the lowest, UK is somewhere in the middle range and Switzerland was at that moment among the countries with high fees in Europe (fees have been lowered since that moment in Switzerland). A clear correlation between level of fees and PMR penetration can therefore not be established on the basis of the available figures presented in this study.

Information received from the **MRUA**, the British user association of mobile radio users, indicated that there were no significant complaints received from users on the current level of the fees in the UK, especially after the fee reduction that took place after the introduction of spectrum pricing. Other factors, such as the scarcity of frequencies or the time to acquire a licence are much more decisive for users in choosing alternatives for PMR.

### 5.3 Current licensing systems for PMR

Since the PMR services were the first radio services, where non-government use was allowed, licensing requirements and fees stem in many countries from the era before deregulation has taken place. Of course some adaptations have been made, such as for instance the licensing of categories of terminals instead of every single terminal etc., but the basic system has in many countries stayed the same.

The system for setting the fee is in most countries a cost recovery system, in a few others the fee setting system is based on the frequency use, i.e. the higher the bandwidth required the higher the fee, finally some countries set their fees according to the principles of administrative incentive pricing (AIP). Countries where the licence fees are set in order to recover costs base their fees on the costs occurring to the administration when the latter acts for the benefit of the individual licensees or the radiocommunication sector. In some countries licence fees have also to be paid for the privilege of a regalian right, which the State delegates to the licensee. This fee is additional to the cost-recovering fee.

Unless the political choice is made that the overhead costs occurring to the administration when the latter acts for the benefit of the individual licensees or the radiocommunication sector are to be paid by the general budget of the State, then these costs should be charged. When charging a cost recovering fee overhead costs are supposed to be included in the fee.

In countries with a comparable standard of living (see OECD price index adjusted figures in Annex Ib) and a similar cost recovery system, it would be assumed that fees would be similar, but this is not the case. On the contrary there is a wide variation. One of the reasons for this could be that the overhead that is allocated to the PMR service differs considerably because of differences in the organisation of the radio agency and its area of responsibility. For instance if there are many regional offices or if telecommunication policy departments have to be paid from the fee income this might raise the overhead costs. Another reason could be that cost recovery systems are not necessarily the same in all countries. Different costs are taken into account, in some countries political issues play a role, cross subsidising might take place etc. This makes it difficult to compare the different cost based fees.

## 6 OPTIONS FOR PRICING AND THE POSSIBLE IMPACT ON PMR FEES

The different methods that can be used for calculating fees for the use of frequencies has been described in two previous ERC Reports<sup>4</sup>. The four methods that are used are:

- cost based pricing
- cost based pricing with differentiation
- administrative incentive pricing and
- auctioning.

---

<sup>4</sup> ERC Report 53: on the introduction of economic criteria in spectrum management and the principles of fees and charges in the CEPT and ERC Report 76: the role of spectrum pricing as a means of supporting spectrum management

It has to be noted though that the last mentioned method (auctions) is a method to assign spectrum to an entity for a specified duration and not a fee calculation method.

In this chapter these four options will be looked at in relation to the PMR services. What are the consequences and possibilities for PMR when using these different options.

### **Cost based pricing**

In a pure cost based pricing system, it is necessary to exactly balance costs with fees for every type of licence. This could mean (although maybe a bit theoretical) that the fee for a very big system using a lot of frequency spectrum is the same as for a small user using little spectrum. The only parameter that is taken into account is the costs made for the issuing of the licence (the direct costs), the costs for enforcement and in certain administrations also a part of the overhead (the indirect costs).

In the case of PMR pure cost based pricing will mean that there will not be a difference made between small and large systems as such. An average fee, based on an average workload, will be asked for all PMR systems. However, in most cases frequency planning for large systems is more work intensive and the same goes for frequency planning in congested areas. On the other hand there could also be cases when a small system near the border will lead to complicated, costly co-ordination procedures. In general, however, the larger users will profit (due to - among others - economies of scale) and the smaller users pay fees that are relatively high.

### **Cost based pricing with differentiation**

To overcome the unfairness of a pure cost based system most administrations have adopted some degree of differential pricing. This allows higher fees for more use of channels or more services. This is usually regarded by users to be fairer for more sophisticated types of licences.

PMR is a good example where differential pricing can be used within an overall cost based framework. Some PMR users have exclusive spectrum covering large areas. Others share spectrum for small areas. Differential pricing may allow fees to be calculated by:

- number of channels or
- number of base stations and mobiles
- coverage area
- exclusive or shared use
- extra facilities
- congestion
- frequency band

In principle this will lead to a fairer situation between the PMR users. When comparing PMR licensees with other licensees, such as for instance, public systems, it could be argued that the workload of the administration for issuing PMR licences as well as the resources required for enforcement are in general higher for PMR than for many other services, since PMR consists of a large number of small users, for whom frequency planning has to be done individually. In the case of public systems frequency planning can partly be left to the operators themselves, which lowers the workload for the administrations and will therefore lead to lower fees. For this reason a cost based system, pure or differentiated, leads to relatively high licence fees for PMR in relation to other users.

Future developments of the cost based system might in theory lead to lower licence fees in the future because of the fact that the PMR systems become more sophisticated and therefore inspection costs and enforcement costs in general will become lower.

### **Administrative incentive pricing**

Administrative incentive pricing provides a means by which licences can be priced to reflect the value of the spectrum used as well as the amount of spectrum used. Where spectrum is in heavy demand, prices may be set higher. This will deter hoarding and encourage efficient usage. Where spectrum is under-utilised, prices may be lowered to encourage more use.

The approach taken in most administrations around the world who have considered administrative incentive pricing, is to define a marginal value of spectrum as a starting point towards formulating some sort of spectrum building block (e.g. a spectrum tariff unit). The building block then needs to be applied to each relevant spectrum product.

Such a spectrum tariff unit could for instance be an amount per MHz per defined geographical area (for instance square kilometre or a cell in a grid). Further the congestion of the band in which the operation takes place will be taken into account as a factor which indicates whether the spectrum is in high demand.

In the case of PMR this will in general lead to lower prices than under a cost based pricing system, specifically for small systems in non-congested areas.

### **Auctioning**

This instrument for allocating spectrum is generally used when a frequency band becomes available for a certain service at one specific moment in time. Another condition for holding an auction is that there are more applicants than licences to be given out. In the case of PMR the number of licences is large and they are granted at different moments in time. This results in the fact that auctions are not a suitable instrument for the issuing of PMR licences and the traditional method of first come first served is the most suitable in the case of PMR. PAMR is a different issue, there auctions are a possibility, since there are one or service providers for such a service and licences could be given out at the same moment in time. It is believed that the United States has used an auction to facilitate local PAMR services to service providers in towns. These service providers may facilitate local PMR services. Australia has also looked at auctioning similar services, which are in fact a combination of PAMR and PMR.

## **7 PMR fees in CEPT countries**

It was considered useful to investigate the background of the current fees and why they are so different. It was decided not to study in depth all the 19 countries which have provided information on their fees for **Annex I**, but to investigate some countries that have the lowest and the highest fees and some, which have fees in the middle range.

The following countries were studied in detail:

- **Denmark and Spain ("low" fees)**
- **UK, The Netherlands, Norway, Switzerland and Hungary ("middle" fees)**
- **France ("high" fees).**

The general fee policy of the country and basis of the PMR fees and the factors that lead to the particular fees (for example coverage area, frequency band, number of mobiles) are described.

In most of the countries there are a number of different fees or fee components, that together form the fee for the system. Except in **Norway**, where the fee is based on the number of base stations and mobiles and the **UK**, where there is one fee, based on the bandwidth, the area covered and the congestion of the area.

In **Denmark** there is a basic fee and a fee for use of spectrum, the amount of which is related to the work done for the sector and is calculated per 25 kHz for base or mobile station and per number of mobiles used. There is no differentiation in relation to frequency bands or congestion. In **Switzerland** a one-off administrative fee, based on costs for the delivery of the PMR-licences is billed. To this adds a monthly administrative fee, based on the costs occurring to the administration when managing the PMR-spectrum. Both fees together build the basic administrative fee which is the relevant fee for the majority of users (55%). An additional incentive spectrum fee, based on administrative incentive pricing (AIP), has to be paid by a minority of PMR-users (45%) whose spectrum use is not considered to of profit for the community. In **France** there is a management fee, based on the power of the transmitter station. This fee is reduced for higher numbers of stations. Further there is a fee for making the frequencies available. This fee is based on the type of the network. In **Hungary** there is a frequency reservation fee and a frequency usage fee. A spectrum tariff unit is used and the fees are based on the number of equipment, the area and the parameters of the system.

The majority of countries have cost based systems with differential pricing in some form or other. Most countries differentiate fees, based on the characteristics of the system or the amount of frequencies used. Two countries (**Hungary and UK**) use administrative incentive pricing. One country (**France**) has a system that is not cost based.

Detailed descriptions of the PMR fee systems per country can be found in **Annex II**.

## 8 SHORT TERM USE OF PMR

PMR is an area where a lot of short term use takes place for instance in case of sport or other events. It would be a barrier for use and considered unfair by the users, if a whole year's fee has to be paid, when use is only made of the equipment for a very short time. In many countries special provisions are made for these situations:

In the UK there is a minimum fee of 1/12 of the yearly fee for short use, in Norway it is 1/2 of the yearly fee. In Switzerland the fee for 1-10 days use is 1/36 of the yearly fee and in Denmark the fixed fee, that all licence holders pay has to be paid as well as a fee based on the actual number of days in relation to the yearly fee. Also in The Netherlands a fee per day is charged for short term use (less than a year).

These examples show that provisions have been made for short-term use, which in most cases take into account the actual time of the use or a minimum term. This is reasonable gesture towards the users, since some aspects of the costs for issuing the licence are the same, be it a licence for a couple of days or for a whole year.

## 9 MARKET DEVELOPMENTS IN THE PMR AREA

There is not so much clarity on the market developments in the PMR area. Also the developments and the expectations in the different countries are not the same. A general feature is though that PMR 446 is growing rapidly in those countries where it is introduced. PMR 446 has proven to be a system that answered to market demand.

Within the other PMR areas there are different experiences and expectations. In the **UK** PMR is growing in all areas, in **France** it is declining, with the exception of the PMR 446 category. In **The Netherlands** the number of licences remains at the same level at the moment, although the intensity of use of PMR is declining, according to the monitoring department. A drastic decline in use of PMR is foreseen to take place in the future (2005-2010). A move of users from PMR towards PAMR is expected.

Another element, which could have influenced the development of the PMR market could have been the move from analogue to digital. This move has been expected for a long time, but has until now not taken place on a large scale and this could be one of the reasons for the market to assume an attitude of expectation. It is expected that this change to digital use will take place on a large scale in the near future and this might lead to further development of the PMR market. In some countries there is already now a pressure to find additional spectrum for digital PMR use (**UK and The Netherlands**).<sup>5</sup>

One of the most prominent issues that have influenced the PMR market and will continue to do so is the use of GSM systems and the second generation services (GSM PRO), which have made it also attractive for a certain group of PMR users.

## 10 VIEWS OF INDUSTRY

### *PMR Market*

Professional users of mobile radio systems can be defined as those users who depend on Professional Mobile Radio services (PMR) and its unique features to support core business functions. In most EU countries there are many thousands of licence holders (approximately 60,000 in the UK and 40,000 in France) and systems vary in size from small single-site systems to wide area multiple site trunked systems. The high volume and diverse nature of PMR systems places unique demands on spectrum allocation, management and licensing procedures.

In most countries PMR systems are deployed in a range of radio frequency bands and users are allocated blocks of spectrum which in some cases may be a small number of frequencies (or even single channels). It is often argued that this results in a relatively high workload in the administration of licences compared with other services. In addition, some administrations include this cost in their pricing method for licence and spectrum fees which results in disproportionately high fees for PMR systems. Business users may therefore be disadvantaged since they are unable to develop private

---

<sup>5</sup> In a market study on the possible uptake of civil TETRA performed for the Swedish administration in 1998 by Omnitele, it was concluded that there was a potential market formed by the existing PMR/PAMR users, who were expected to transfer to TETRA as soon as costs were lower than their current systems.

systems competitively and improve business efficiency with new technologies and applications. It is therefore important that administrations do not discriminate against private systems by charging excessive spectrum and licence fees.

### ***Pricing Methodologies***

It is recognised by Industry that the spectrum allocation and licensing regimes will vary from country to country and that it would be difficult to achieve total harmonisation. From an industry perspective, the key concern is that spectrum and licence fees should be reasonably level across the all the CEPT countries and that pricing structures should not result in disproportionately high fees for PMR users. Comments on the various pricing methods are provided below:

#### ***Cost Based Pricing***

A pure cost based pricing regime can lead to relatively high fees for PMR users due to the greater administrative workload. There are also wide variations across different countries in the cost base used to determine fees. Examples of high fees for PMR services have already been identified elsewhere in the draft ERC report 73, especially in certain countries, which have adopted cost based regimes. This results in a competitive imbalance between cellular and private systems and can discourage users from deploying new radio services to increase business efficiency. This is therefore not considered to be an acceptable pricing mechanism.

#### ***Differential Cost Based Pricing***

Differential cost based pricing can help to overcome the imbalance in fees by introducing adjustments to fee structures based on services, technology, or resources used. PMR fees can therefore be adjusted to create a more competitive balance between services and to encourage the development of business critical radio systems. It is important that any cost base regime should include differential pricing.

#### ***Administrative Incentive Pricing***

The preferred pricing method is administrative incentive pricing regime where charges are based on the amount of spectrum used, surface of coverage and the perceived value of the spectrum. This incentivises the efficient use of spectrum and does not penalise small PMR users.

#### ***Auctions***

The use of auctions is not considered appropriate for allocating spectrum to network operators. Furthermore it is not considered to be an appropriate mechanism for the PMR market which has a large number of small operators requiring different quantities of spectrum at different points in time.

#### ***Conclusions***

It is important that the PMR user community is not disadvantaged by excessive licence and spectrum fees which creates competitive imbalance with other services (such as cellular). The preferred pricing method is the Administrative Incentive Pricing regime where prices are based on the quantity of spectrum used and the perceived value of the spectrum. Where administrations insist on using a cost based regime, this should be modified by using a differential pricing mechanism in order to balance costs across different services.

The French industry has made a proposal on the introduction of Administrative Incentive Pricing for PMR and also other services in France. The basic idea of the proposal is not to base PMR fees on the number of base stations and terminals but on the area, where the spectrum is not usable anymore by others in combination with the bandwidth and correction factors, such as congested/rural areas, sharing etc. These proposals were well received by ART but there were some legal issues to be solved, such as the fact that it is, according to the French legislation, not possible to distinguish between congested/rural areas. A system of per channel pricing is already introduced in the area of PBMR (Professional Business Mobile Radio) or RPX trunking and for walkie-talkies.

## **11 CONCLUSIONS AND PROPOSALS**

### **11.1 Differences in charging systems**

As can be concluded from the examples in **Annex I**, the PMR fees in the CEPT countries that answered to the questionnaire differ considerably. The question could be asked whether this fact as such is to be considered as a market barrier, since PMR systems are very local systems and therefore differences in fees are relatively unimportant as long as they remain within reasonable boundaries.

However in a number of countries the fees appear to be high in relation to the investment and running costs so that they might be considered to be a discouragement for the use of PMR. In many other countries they are at a level, which is below a level that is likely to be a discouraging factor for use of PMR. It might also be asked if the investment and running cost are suitable for comparison. Another approach would be the relation to the communications service value, based on the business possibilities offered by the use of PMR. Such models, however, have not been developed so far in any CEPT country for PMR. For other radio communications systems auction results could be seen as a starting point to identify the valuation of business opportunities. Unfortunately huge differences have appeared throughout CEPT in the results of e.g. UMTS spectrum auctions which are at least difficult to explain and indicate that auction results do not directly relate to business opportunities.

It is interesting to compare the different systems used for the setting of fees in the different countries and to see whether it can be concluded that certain systems lead to higher fees than others.

The following countries were studied in detail:

- Denmark and Spain ("low" fees)
- UK, The Netherlands, Norway, Switzerland and Hungary ("middle" fees)
- France ("high" fees).

In most of these countries there are a number of different fees or fee components, that together form the fee for the system. Except in **Norway**, where the fee is based on the number of base stations and mobiles and the **UK**, where there is one fee, based on the bandwidth, the area covered and the congestion of the area.

In **Denmark** there is a basic fee and a fee for use of spectrum, the amount of which is related to the work done for the sector and is calculated per 25 kHz for base or mobile station and per number of mobiles used. There is no differentiation in relation to frequency bands or congestion. In **Switzerland** a one-off administrative fee, based on costs for the delivery of the PMR-licences is billed. To this adds a monthly administrative fee, based on the costs occurring to the administration when managing the PMR-spectrum. Both fees together build the basic administrative fee which is the relevant fee for the majority of users (55%). An additional incentive spectrum fee, based on administrative incentive pricing (AIP), has to be paid by a minority of PMR-users (45%) whose spectrum use is not considered to be of profit for the community. In **France** there is a management fee, based on the power of the transmitter station. This fee is reduced for higher numbers of stations. Further there is a fee for making the frequencies available. This fee is based on the type of the network. In **Hungary** there is a frequency reservation fee and a frequency usage fee. A spectrum tariff unit is used and the fees are based on the number of equipment, the area and the parameters of the system.

The majority of countries use cost based systems with differential pricing (**The Netherlands, Norway**). In **Denmark** a cost based system with differential pricing is used but political considerations can be taken into account. Most countries differentiate fees, based on the characteristics of the system or the amount of frequencies used. Two countries use administrative incentive pricing (**Hungary and UK**). One country (**France**) does not use a cost based structure. In France, income out of fees flows directly in the government finances and the costs of the Agency are paid out of government funds and are not related to the costs made for the licensees.

Cost based pricing as well as spectrum pricing can both lead to prices that are similar and acceptable for the users, when looking at the licence fees paid for other services, as is indicated by the systems in the **UK, Denmark and Hungary**.

It can therefore not be concluded that either cost based pricing or spectrum pricing is the preferred system with regard to the PMR service in relation to the fees.

Some other countries, which also use cost based pricing, levy fees which are much higher. One of the reasons for this could be that the overhead that is allocated to the PMR service differs considerably or that quality or quantity of procedures and services to the customer differ.

There might be other reasons though to choose for spectrum pricing or not to do so. One reason is for example that spectrum pricing is only possible when there is scarcity. If this is not the case the system will not work properly.

## 11.2 Properties of PMR in relation to fees

PMR is by nature a complex form of radio use, which is resource intensive for the administration and makes investment in a number of tools necessary. An assignment tool is needed, a band plan has to be made, individual engineering has to be done, the bands have to be monitored intensively, licence database interrogation has to take place, site inspection and surveillance have to be performed, co-ordination has to take place in many cases, etc. Specialised technical and administrative personnel is necessary to perform these tasks, as well as computing tools such as terrain databases.

Also, the fact that the large majority of the PMR client base of the administration consists of small PMR users, which need guidance and help, the service of the administration is resource intensive.

Because of all these reasons costs have to be made by administrations and these costs have to be recovered, either directly from the PMR users, via cross subsidising, or the general budget of the State.

PMR is therefore generally not suitable for licence exemption. An exception being systems such as PMR 446, where frequency assignment is not necessary and monitoring activities will be very limited.

## 11.3 Level of fees and differences in fees

### 11.3.1 Level of fees

As indicated before the licence fees are quite different and are in a number of countries high, which could lead the suggestion that potential customers would be scared off, especially when the high fees are combined with tedious licensing procedures. This might lead to choosing other alternatives with technical characteristics which are not identical with PMR/PAMR-applications and might not be the best choice for the communications requirements of the users.

It was therefore investigated how the licensing costs relate to the investment costs and running costs of the PMR networks.

The overall conclusion on the level of fees is that in a number of countries the fees appear high so that they might be considered to be a discouragement for the use of PMR. In many other countries they are at a level, which is below a level that is likely to be a discouraging factor for use of PMR.

These high fees could be explained by higher service levels or higher overhead, taxes that have to be levied etc.

### 11.3.2 Differences in fees

When comparing fees it should be noted that in cost based pricing systems, overhead costs are taken into account (unless only the costs made for the individual user can be charged). In countries with a comparable standard of living and a similar cost recovery system, it would be assumed that fees would be similar, but this is not the case. On the contrary there is a wide variation.

One of the reasons for this could be that the overhead that is allocated to the PMR service differs considerably because of differences in the organisation of the radio agency and its area of responsibility. For instance if there are many regional offices or if telecommunication policy departments have to be paid from the fee income this might raise the overhead costs.

Another reason might be the different factors that have to be taken into account, such as the elements mentioned in the previous paragraph, which influence the costs of the administration. An administration can for instance choose to have site inspections or not, or to invest in a terrain database or not. There might also be a different „service level“ in the administrations (more monitoring, more coordination etc.), which may lead to differences in fees.

It was not possible -apart from the general reasons for differences in fees, as mentioned above-, to find precise reasons why fees are so different, based on the available information. However, **Switzerland** has exposed its cost structure for PMR (see **Annex III**).

One of the conclusions from the ETO study on fees<sup>6</sup> was that there is a relation between high fees and the complexity of fees. This could be reason for high fees in for instance France, but on the other hand the fee system in Spain is very complex, but the fees are low, so at least in the area of PMR this, seemingly logical, conclusion is not always applicable.

In order to sum up, the reasons for differences in the height of fees can be manifold:

- Different **structures** of the administrations/radio agencies (accordingly different cost factors); and/or
- Different **legal** principles, different interpretations by administrations of similar legal principles (as to their scope and effects) and when there is a leeway inside the legal framework different **political** objectives of administrations can also come to bear; and/or
- Different **financial** principles and methods by the administrations for the determination of the relevant costs and the amount of these which have to be considered when setting the cost-covering fee. Moreover the cost-implying activities for the benefit of radio licensees by the administrations which are considered relevant when setting the height of fees may not be the same everywhere, in particular considering the costs arising from international activities, radiomonitoring, the preparation of technical standards/guidelines and the overhead of the agencies/regulators.

#### 11.4 Fees and demand

Several studies have been performed in order to investigate the influence of fees on the demand for licences.

These studies investigated the price elasticity and the steering effect of the fees. The results were that low price elasticity was found. Licensees would accept a higher fee, this relation was even found in a country, where licences are already extremely high.

Reasons could be that that this only applies to licensees, „who have nowhere else to go“. Others, who have an alternative, might have turned away already or that PMR is considered cost effective and has features not available with alternatives.

There are other studies, which provide figures on the number of users in various countries and on the market penetration of PMR. Conclusions of one of these studies (see **chapter 5.1**) are that the highest number of users are to be found in countries with low fees as well as countries with high fees. A clear correlation between level of fees and PMR penetration could therefore not be established.

In can therefore be concluded that the level of fees is not a decisive factor for potential users of PMR, at least when they are users for whom PMR is clearly the most obvious solution for their communications needs. Other factors, such as the scarcity of frequencies or the time to acquire a licence are much more decisive for users in choosing alternatives for PMR.

Although price elasticity seems low, this does not remove the responsibility from administrations to ask fees for PMR licences, which are reasonable in relation to the costs made by the administrations (if a cost based system is used) and in relation to fees for other services in case of administrative incentive pricing.

#### 11.5 Attention for the subject of fees

Information received from administrations in the course of developing ERC Report 73 as well as this ERC Report indicated that a number of administrations have started internal investigations on their fees and the background of calculating them and have decided, based on the ongoing work in the CEPT and the comparisons with other countries to change the calculation base of their fees and thereby making them more transparent and in some cases lower them. This information was received for instance from Italy, Norway and Switzerland.

This leads to the conclusion that it is very useful to give attention to the topic of fees and make comparisons between the fees of different countries.

---

<sup>6</sup> Fees for licensing Telecommunications Services and Networks, October 1999

## 11.6 Proposals

Reasonable fees for PMR licences should finance the costs of the administrative work made in favour of the PMR-sector, should not deter the user from applying PMR-technology, should prevent hoarding of frequencies, should be politically acceptable and should be fair in relation to fees for other services in case of Administrative Incentive Pricing (AIP).

Administrations are therefore encouraged to check their work processes and their methods of calculation and accounting systems. They should compare their systems with those of other countries, which have comparable circumstances. If a national administration is aiming at covering the costs of the management and control of the radio spectrum, the cost-generating elements must be analyzed and the costs for all spectrum management functions must be identified. These spectrum management functions are listed in Annex III of ERC Report 53 (which in turn followed the ITU-R National Spectrum Management Handbook).

Unfortunately this study does not give the answer to the question what the most appropriate or benchmark fee for PMR would be. As can be seen from the previous paragraphs, there are many factors to be taken into account and there are many differences between administrations with regard to the elements they base their licence fees on.

If requested such work could be undertaken, a start was made by Switzerland (see **Annex III**) and this could be compared with the data of other countries. It should be noted though that there is no political will in all administrations to embark on such processes.

With regard to work processes and procedures simplification should be aimed at as much as possible, since this could keep the cost down and thereby the fees. In the PMR area this could for instance be done by not taking every single terminal into account, but only certain classes of number of terminals or only the base stations. Licence fees based on the number of base stations are going to be introduced in **The Netherlands** and **Norway**.

Another example of simplification could be to take only the use of spectrum into account with differentiation regarding for instance: the frequency band, congested or non congested area etc. into account. This is introduced in **UK** and partly in **France**.

Transparency in the fee setting is important. Some administrations publish their fee calculation system and their fees. Also the draft Directive on the authorisation of electronic communications networks and services mentions the need of transparency in several instances, so this is something the administrations, which are covered by the EU regulation are forced to introduce when this Directive has to be implemented.

Some administrations have started a dialogue with the users in order to get information on what the requirements of the users are in relation to the licences and the fees. This leads to more acceptances of the fees and their level. This is for instance done in **UK and Denmark**.

**Example PMR fees in EUROS (see explanatory notes overleaf.)**

Administration		Systems				
		*One	*Two	*Three	*Four	*Five
Austria	<b>First Year Fee</b> <b>Every Year Fee</b>	60 49,05 Euro one off fee (without co- ordination)	288	153 98,1 Euro/month (with co- ordination)	13080 (independent of number of radio stations)	11508  981,10 euro one off fee.
Belgium	<b>First Year Fee</b> <b>Every Year Fee</b>	520 466	2001 1894	3429 3322	54683 54576	37987 37880
Bulgaria	<b>First Year Fee</b> <b>Every Year Fee</b>	164 70	307 123	409 164	1534 665	3885 1534
Cyprus	<b>First Year Fee</b> <b>Every Year Fee</b>	263	578	1628	22732	11550
Czech Republic	<b>First Year Fee</b> <b>Every Year Fee</b>	16	69	240	1964	1309
Denmark	<b>First Year Fee</b> <b>Every Year Fee</b>	42	50	122	769	604
Finland	<b>First Year Fee</b> <b>Every Year Fee</b>	80~	218~	595~	6513~	4370~
France	<b>First Year Fee</b> <b>Every Year Fee</b>	76 (per frequency)	1238< 1 W 1448 > 1W	5402	20539	68602
Germany ♦	<b>First Year Fee</b> <b>Every Year Fee</b>	199 56	362 124	931 360	10798 3643	6026 2475
Hungary	<b>First Year Fee</b>					
160 MHz Band 400 MHz Band	<b>Every Year Fee</b>	475 475	475 356	807 807	3678	6169
Ireland	<b>First Year Fee</b> <b>Every Year Fee</b>	137	274	754	5079	5028
Italy	<b>First Year Fee</b> <b>Every Year Fee</b>	1185	1831	4383	21206	19298
Netherlands	<b>First Year Fee</b> <b>Every Year Fee</b>	213 82	554 423	1210 750	7833 7309	8905 8445
Norway	<b>First Year Fee</b> <b>Every Year Fee</b>	185	557	1486	5116	3750
Portugal	<b>First Year Fee</b> <b>Every Year Fee</b>	80 uhf 115 vhf	239 uhf 314 vhf	1274 uhf 1624 vhf		
Spain	<b>First Year Fee</b> <b>Every Year Fee</b>	60	60	60		
Sweden		44	82	224		
Switzerland ▲	<b>First Year Fee</b> <b>Every Year Fee</b>	112 79	513 415	1382 1284	47'673 47'542	N/A
Turkey	There is no kind of classification in fee collection. Payment is being made on the basis of number of channels used.					
UK	<b>First year Fee</b> <b>Every Year Fee</b>	107	200	714	5000	8570

♦ Each fee given for Germany consists of a *single frequency fee* and an *annual frequency usage contribution*, the latter has to be calculated every year. The fees are based on the assumptions that the first year is the year 2000 and the relevant frequencies were assigned to the individual operators in January 2000. An additional fee (*annual EMC fee*) might be necessary in the future. PMR frequencies are assigned in Germany on a shared basis (see System 5). Authorities can be exempted from the necessity of paying fees for frequency assignments.

# Nearest equivalent is a trunked system which would have exclusive channels operating in the band 410 - 430 MHz with a range to 20 - 30 Km.

- ▲ normal use are simplex systems in Switzerland (only one frequency) so the fees are lower.  
~ PMR - Licence fee 15.8 EURO/mobile transmitter and 6.0 EURO/base station transmitter. The fees do neither depend on service area, not the number of channels or nature of channel. (shared/exclusive.)

### Sample Systems for PMR Licence Fee Comparison

#### System 1

5 handportables only (no mobiles and no base station) operating over an area of approx. 1 km radius using non-exclusive PMR spectrum;

#### System 2

10 mobiles with 1 base station operating over an area of approx. 10 km radius using non-exclusive PMR spectrum;

#### System 3

1 base (or control or trigger) station controlling 1 repeater (or remote base or relay) station at 10 km distance with 30 mobiles operating over an area of approx. 15 km radius around the repeater station using non-exclusive PMR spectrum;

#### System 4

A trunked PMR system of 3 base stations and 400 mobiles using 3 exclusive PMR channels over an operation area of approx. 10 km;

#### System 5

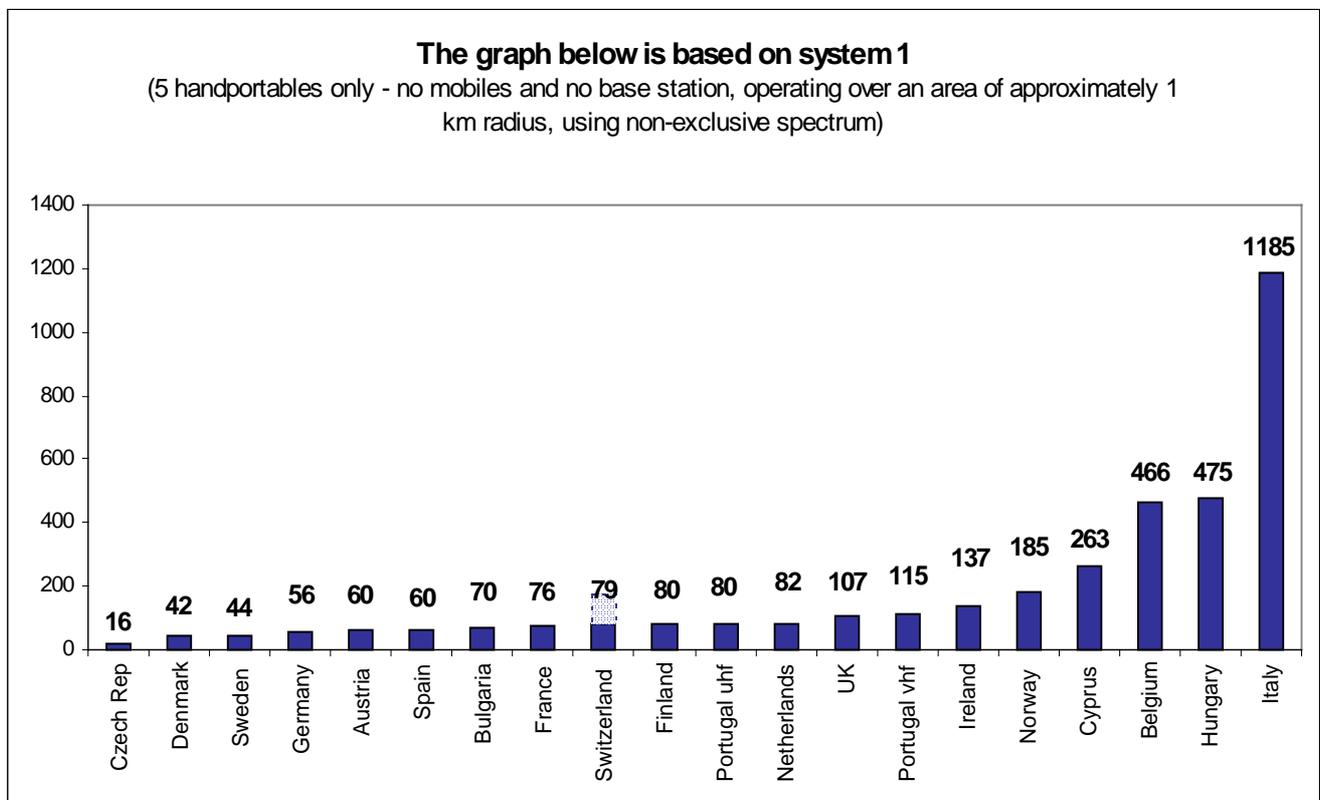
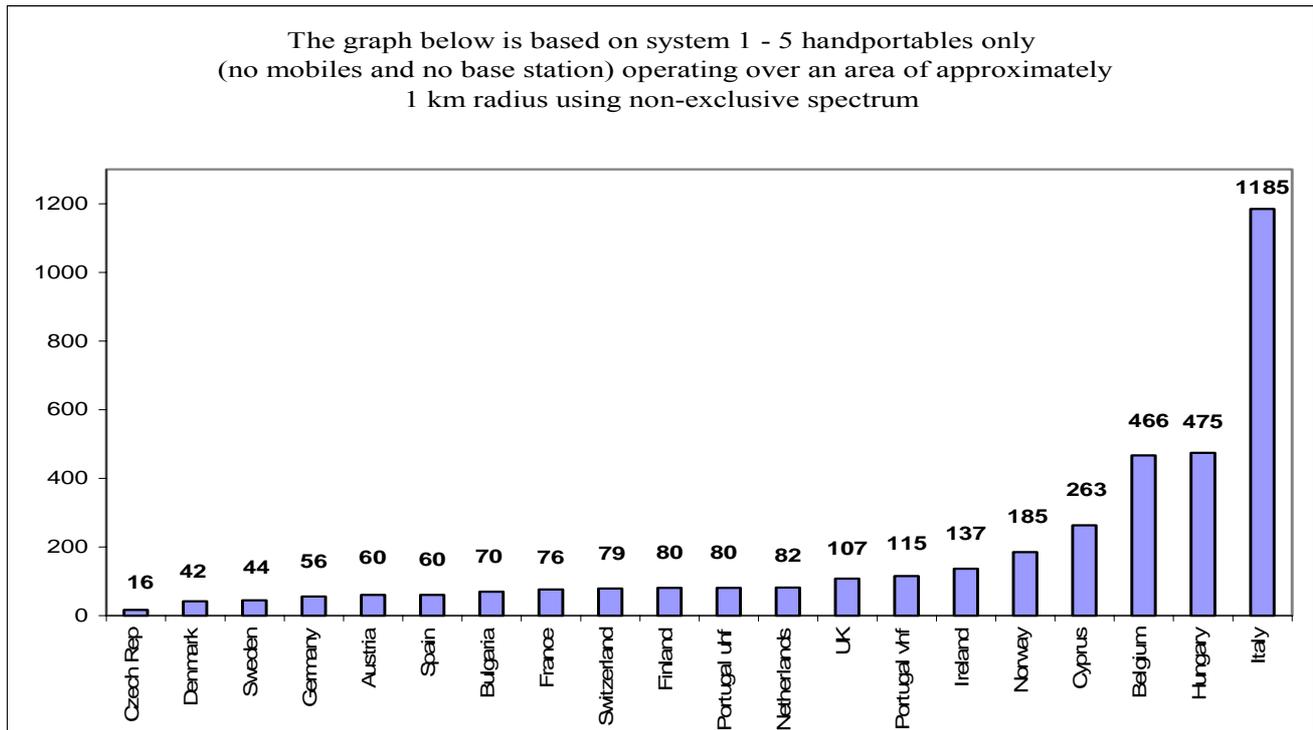
A PMR system using a single national (available nation wide) exclusive PMR channel. For Administrations not making a national exclusive channel available, a 20 base station with 200 mobile system using exclusive PMR spectrum.

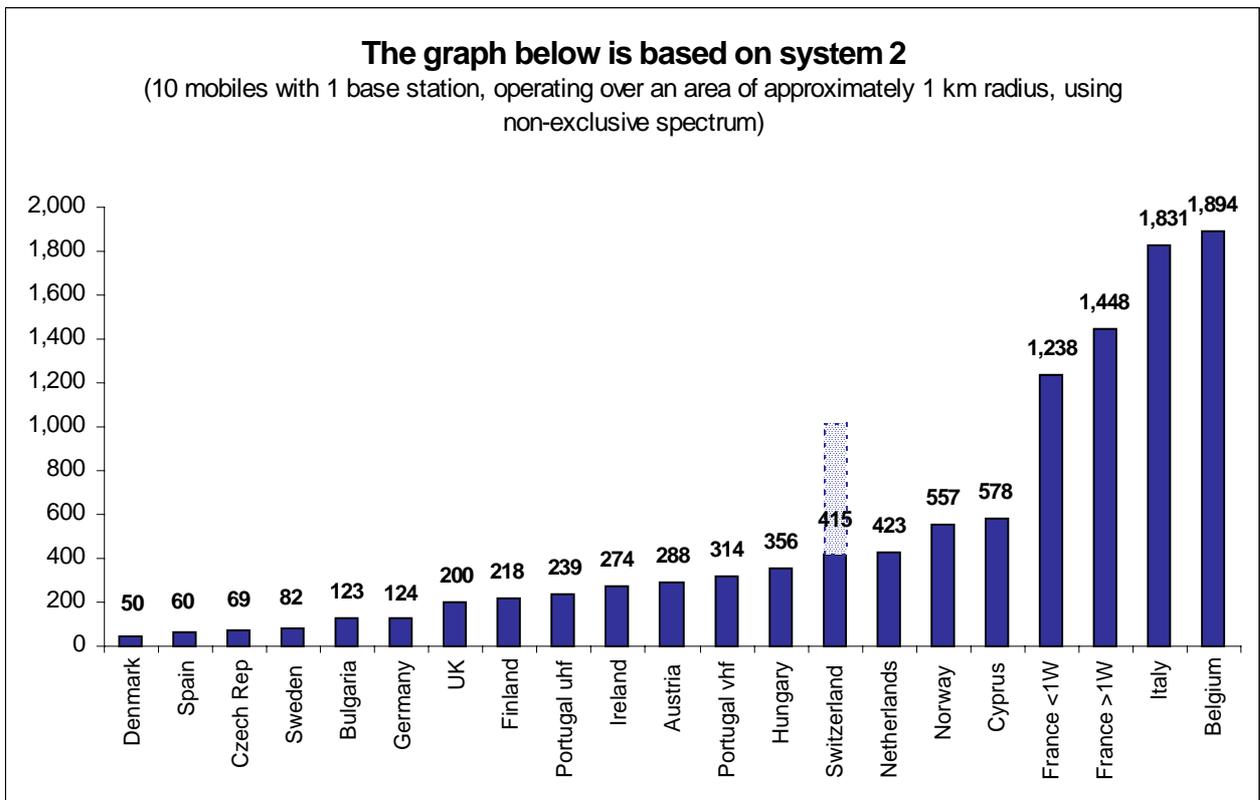
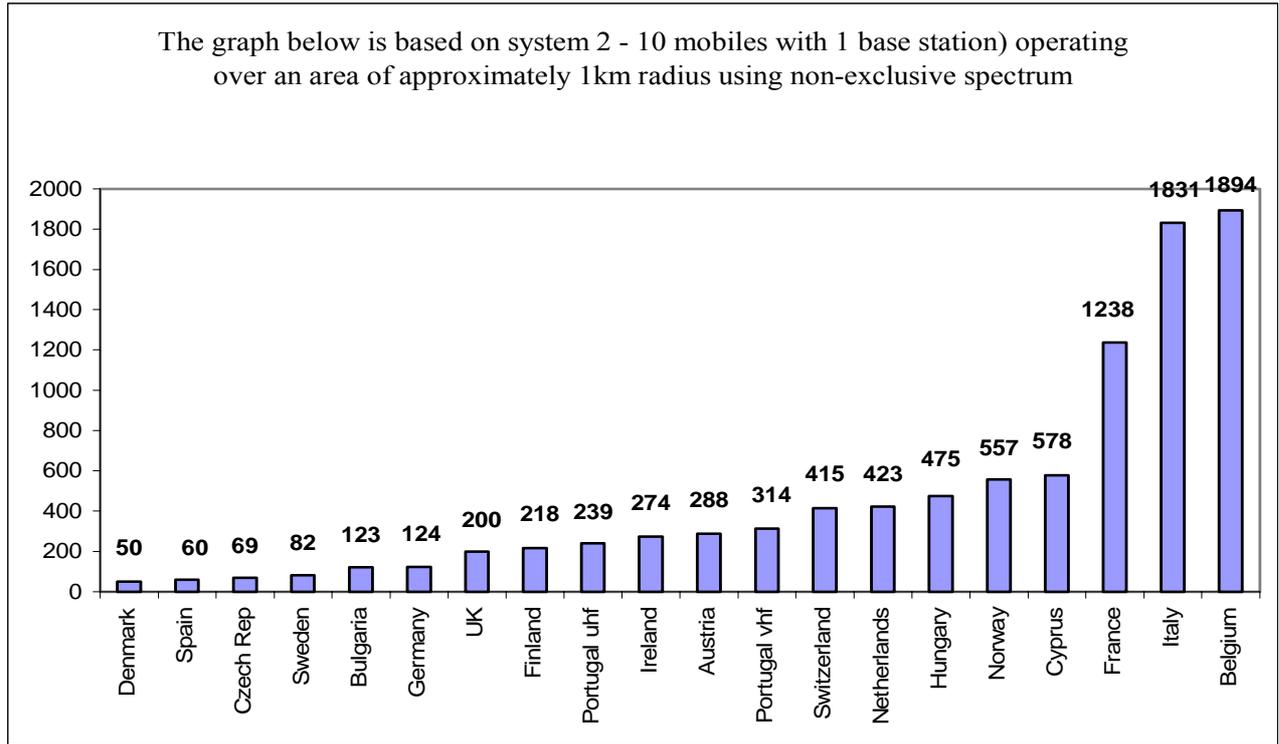
#### NOTES;

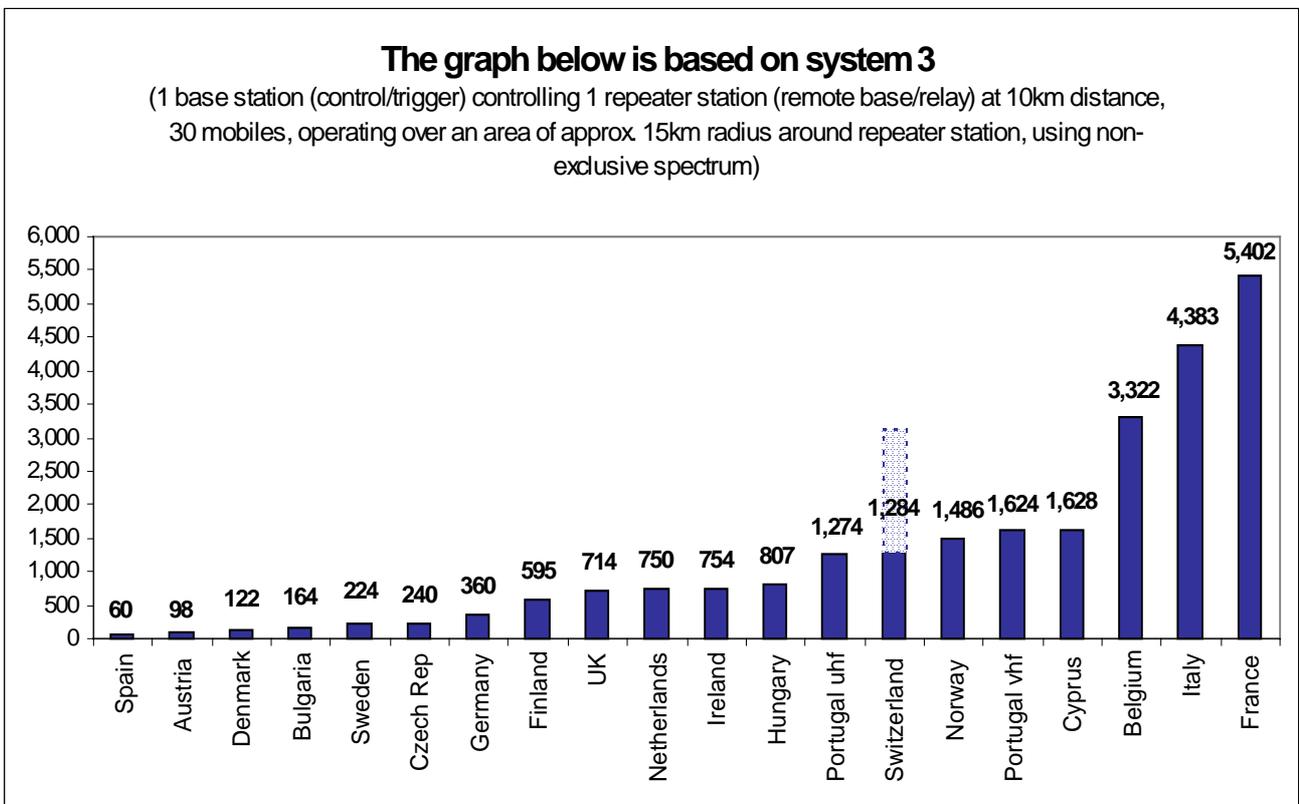
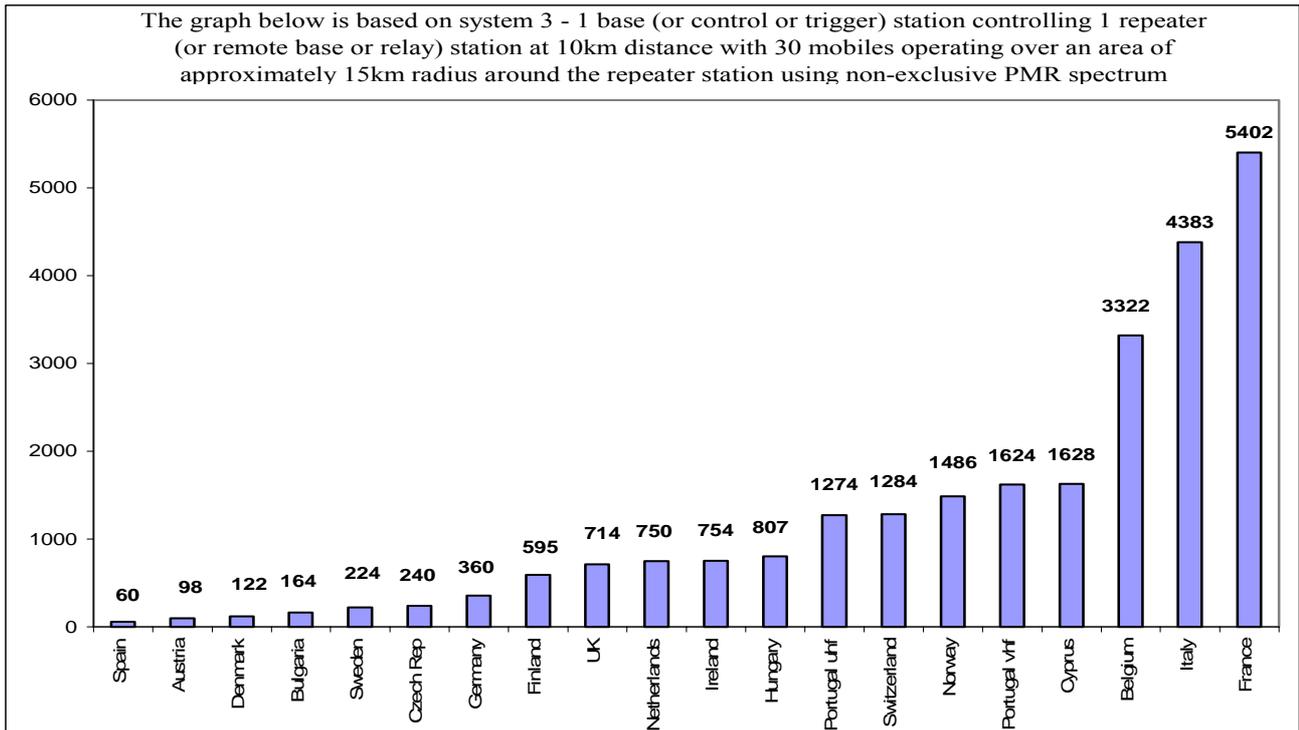
It was agreed that for ease of comparison:-

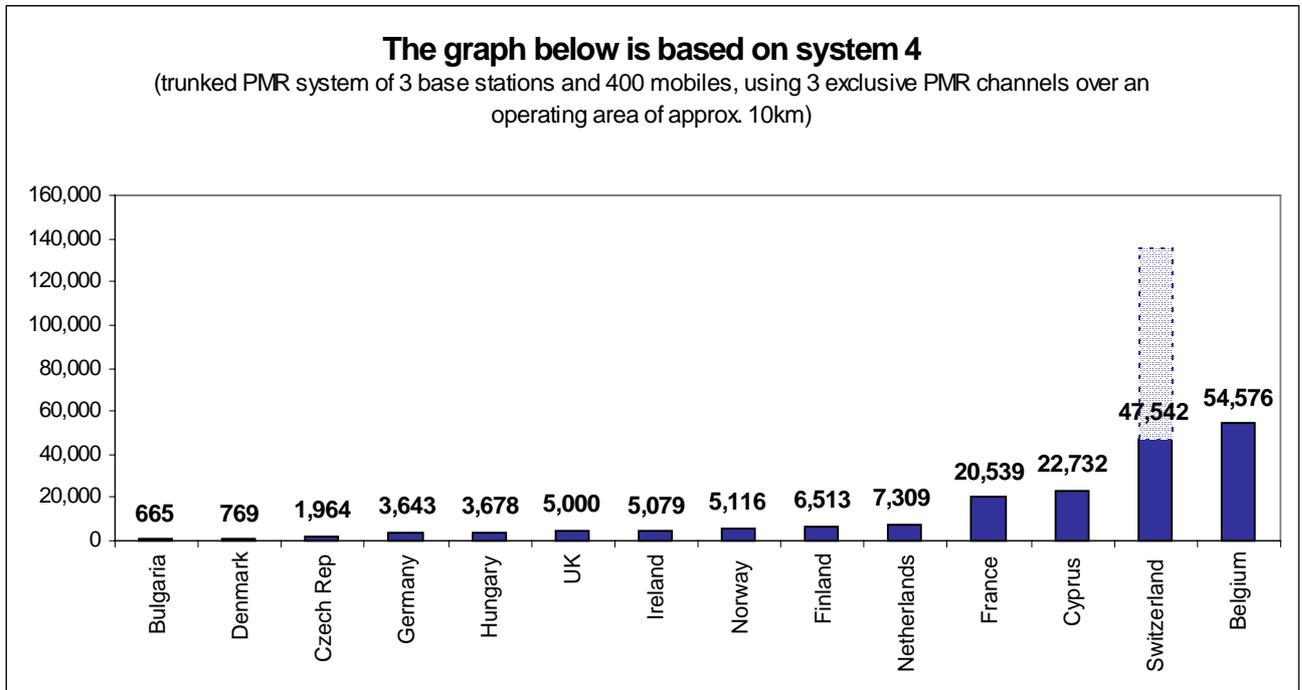
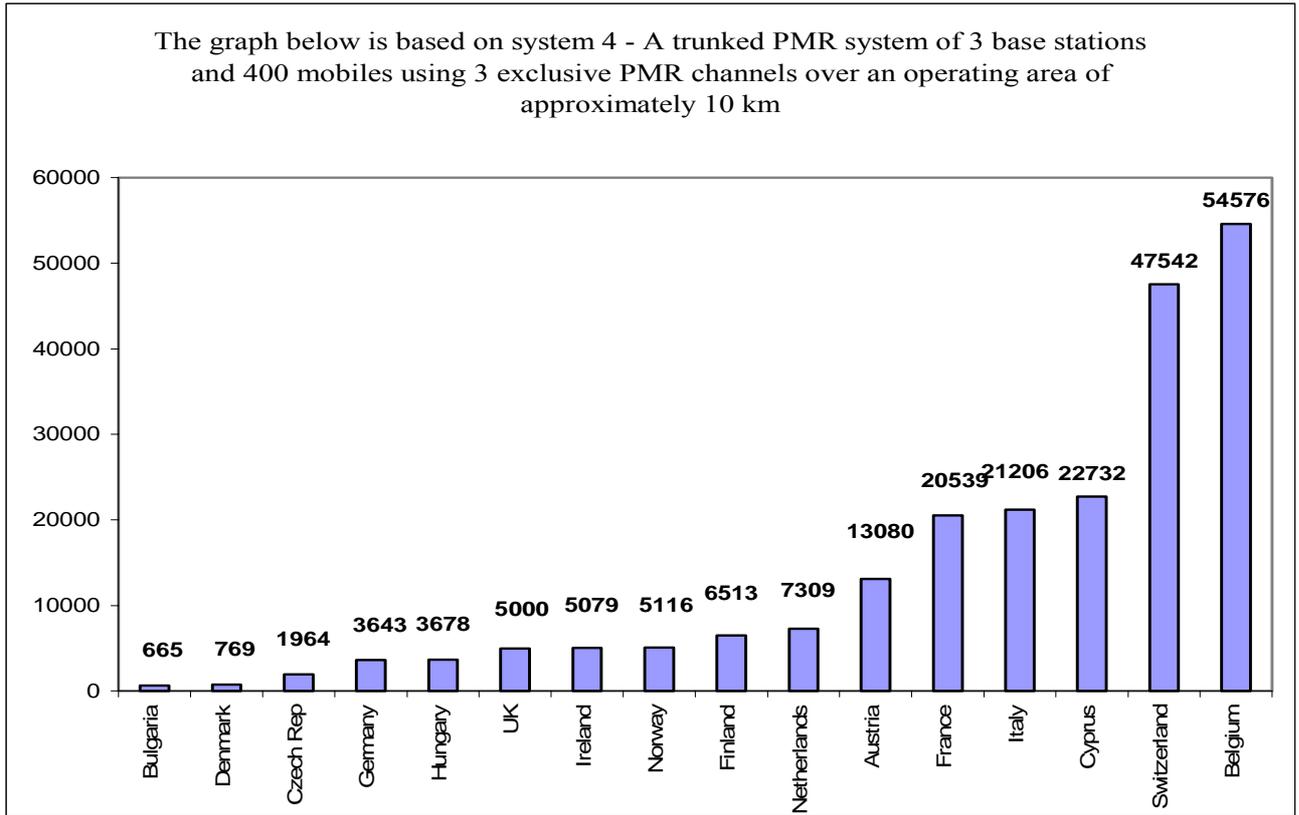
- i) The fee should be the total fee for each complete system (i.e.: not per base or not per mobile)
- ii) All fees should be expressed in EUROS;
- iii) The fee on issue of a new licence and the fee on renewal should be given where they are different.
- iv) It is assumed that all systems are duplex.
- v) Figures are not adjusted with OECD price level indexes.
- vi) Figures for Switzerland in Annex I reflect the basic administrative fees which is the relevant fee for the majority of PMR users (55%).
- vii) Figures for Switzerland in Annex 1 (b) reflect the basic administrative fee fees which is the relevant fee for the majority of PMR users (55%, plain colour). 45% of the PMR-users (radio-use without profit for the community) pay an additional spectrum incentive fee. (half-transparent).

Annex 1 (b) Graphical representation of PMR fees

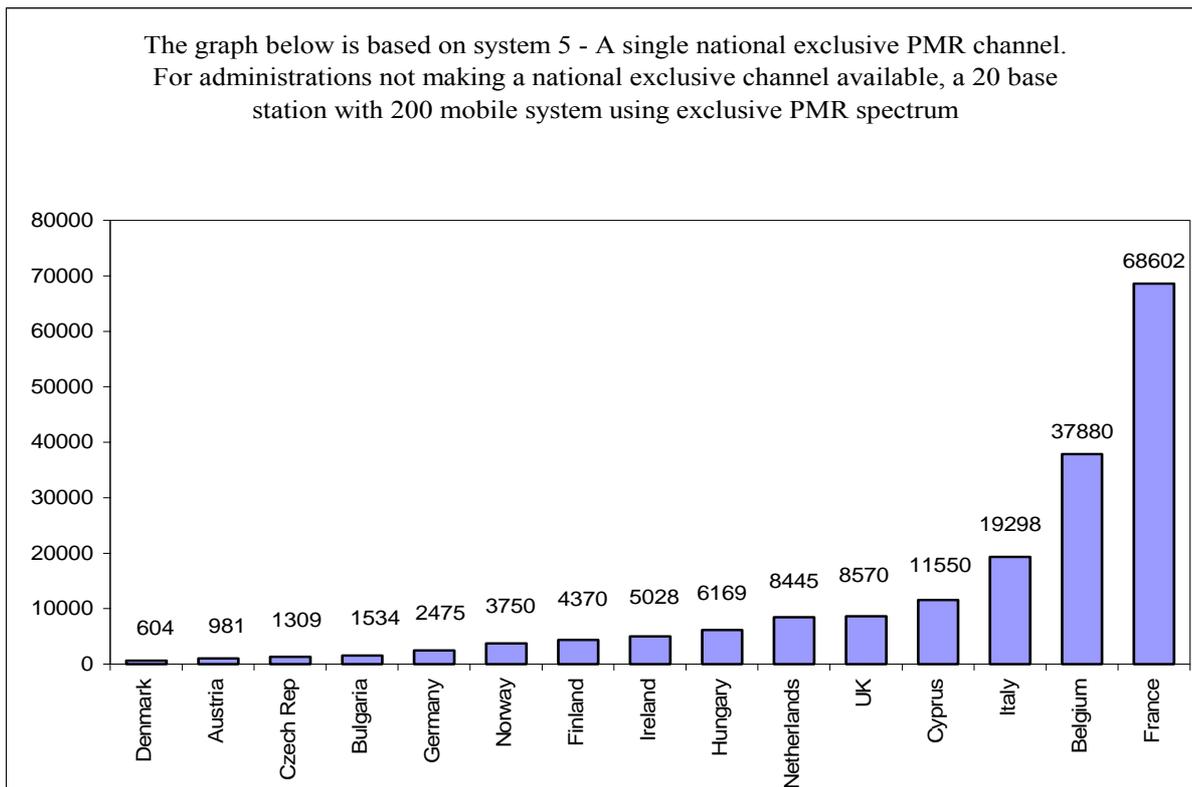






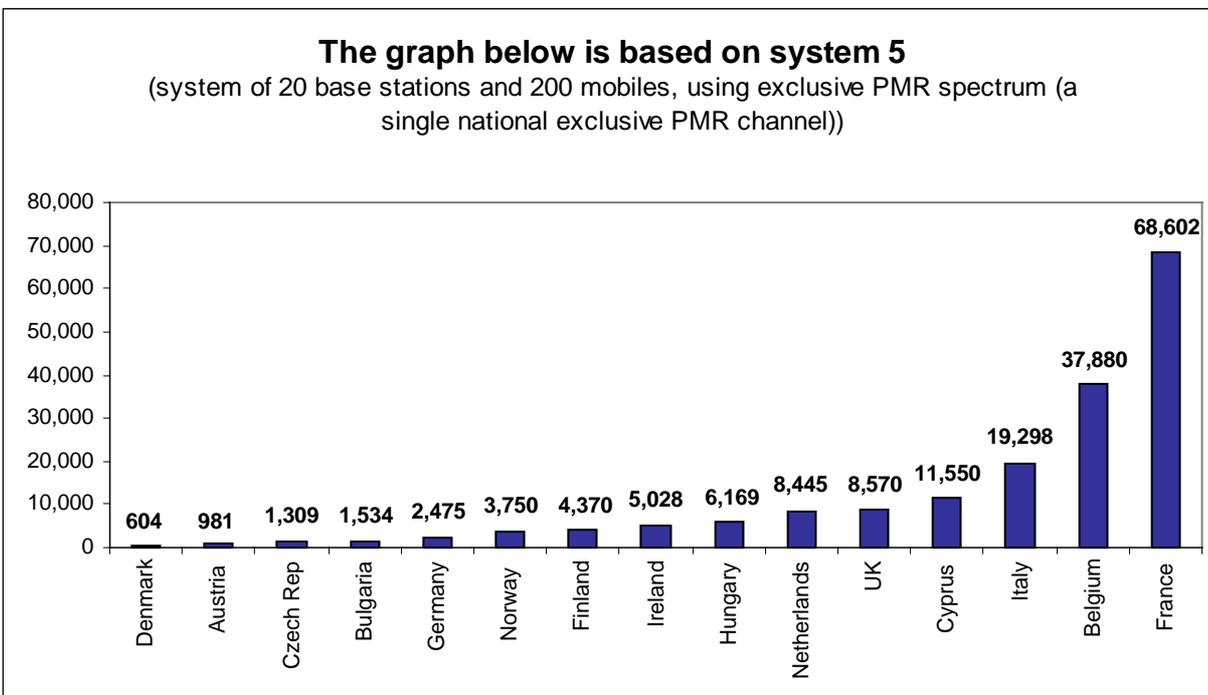


The graph below is based on system 5 - A single national exclusive PMR channel.  
 For administrations not making a national exclusive channel available, a 20 base station with 200 mobile system using exclusive PMR spectrum



**The graph below is based on system 5**

(system of 20 base stations and 200 mobiles, using exclusive PMR spectrum (a single national exclusive PMR channel))



## Denmark

### *General Fee Policy*

In Denmark, according to the Act on Radiocommunications and Assignment of Radio Frequencies spectrum fees shall reflect licence holders' use of spectrum. Therefore fees shall be charged that reflect exclusive or shared use, the bandwidth used and geographical coverage. The basis of the calculation of fees is the cost of administration and of other services provided by the National Telecom Agency to the telecommunications sector in the field of radiocommunications. This amount is approved by parliament yearly and is divided over the licence holders according to their spectrum use. Denmark applies a cost based system with differentiation based on certain models for the different services, although, when setting the fees also political considerations may play a role.

One of the aims of the Act is that users be given access to a wide, varied and inexpensive range of telecommunication services. Spectrum management principles that may increase the price of service to end-users are therefore generally inconsistent with Danish policy.

In areas where demand exceeds supply, and where the first-come-first-served principle cannot therefore be applied, the Act provides for the following frequency administrative methods: public tendering, administrative redistribution, requirements for changeover to more frequency effective methods of utilisation or technologies, requirements for reduced usage, and administrative withdrawal. Finally, the latest addition to the list of frequency administrative/economic methods is auction.

### *PMR*

In the PMR area this general fee policy leads to the following sector fee policy:

All licence holders in Denmark, and therefore also all PMR licensees pay a yearly fee for issuing the yearly licence. This fee also has to be paid when a licence is changed. For the year 2001 this fee is 24 EURO. This is a basic fee or tax, which is not related to any work done for the PMR sector. Reasons for this fee are the creation of stable, basic income for the agency, to prevent large fluctuations in the licence fee for the users and to prevent users from unnecessary requesting changes to their licence.

Apart from this basic fee or tax a fee related to the use of spectrum has to be paid, which is related to the work done for the sector. This fee is **21 EURO** for 25 kHz for base or mobile station and a fee per number of mobiles used. There are 15 classes of number of mobiles. Fee for 1 mobile is **3 EURO** and for 4501-5000 mobiles **11688 EURO**.

When calculating a PMR fee the following factors are taken into account:

- \* the frequency band: frequencies below 3 GHz are a factor of 10 times more expensive than those above 3 GHz
- \* the frequency reuse possibility in the country, which is 8 in the case of PMR
- \* bandwidth ( amount 21 EURO per 25 kHz). This amount has to be paid per site, also in the case of very large or nation wide networks.

There is no difference between the fee for the first year and for subsequent years.

### Transparency

The fees itself as well as information about licence procedures and the fee policy are available from the website of the Danish National Telecom Agency: <http://www.tst.dk/>

## France

### 1 – General Fee Policy

In France the authorisation holders, relating to the telecommunications networks which use radio frequencies, are subject to the payment of fees provided for by the Telecommunications Act (1996), by the modified decree of 1993 and, if necessary, by the decrees relating to these authorisations.

Moreover, these holders are subject to the payment of taxes instituted by the Finance Acts and relating to the constitution of the files, the management and the control of the authorisations.

However, the Finance Act for 2000 deleted these taxes for the PMR and the networks in experimental matter authorised for a duration less than three years.

The fees related to the frequencies are payable each year and correspond to fees for management and fees for availability of the frequencies.

The management fees can be, according to the type of network, contractual (all-in price) or based on the number of transmitter stations.

The fees for availability of the frequencies depend on the type of network and the way in which the frequencies are used (fixed links or mobile connections).

## 2 – PMR

All the users of frequencies for telecommunications needs pay the fees according to the tariffs in force except for the two following user categories:

\* The local authorities (commune, department and region) and their groupings, when they operate a network, for their own needs, pay only 50 % of the fees for availability of frequencies.

\* Are exempted from the payment of the fees for availability of frequencies:

- the emergency assistance services of the public hospitals,
- the fire and help services,
- the departments ensuring missions of civil safety under the conditions fixed by a ministerial decree.

Three examples are examined here: private use network, shared use network and network using exclusive frequencies.

### 2.1 – Private use network

#### 2.1.1 – Management fee

The management fee is fixed at 19 EURO per transmitter station when the power provided to the antenna is lower or equal to 1W and 38 EURO when this power is higher than 1W.

This fee is reduced according to the number of stations: reduction of 35 % between 26 and 50 stations, reduction of 66% beyond 50 stations.

#### 2.1.2 – Fee for availability the frequencies

2.1.2.1 – For a connection established between 2 stations, the fee is a function of the maximum distance which separates them, of the nature and of the type of the connection. The following table gives the amount of fees for a one-way connection for three different distances

**Error! Bookmark not defined.**

Maximum distance in km	Connection between two base stations	Connection between a base station and a mobile or between two mobiles
2	50 EURO	29 EURO
10	221 EURO	76 EURO
100	2 134 EURO	244 EURO

For a bi-directional connection, the fees correspond to the amounts above multiplied by 1,5.

The amounts of the fees are corrected by a coefficient of digressively taking account of the number of connections.

## 2.2 – Shared use network

### 2.2.1 – Management fee

Identical to the § 2.1.1

### 2.2.2 – Fee for availability of frequencies

2.2.2.1 – The following type of network are distinguished: monosite network, multisite network, network using only one channel, network using several channels and, in this last case, network using or not the technique called „shared resources“.

The fee is calculated according to the total number of connections corresponding to the base stations and mobiles connected to the network.

For the case of a monosite network using one channel, the fee is calculated starting from the following table:

<b>Error! Bookmark not defined.</b> Maximum range of the base station in km	Fee by connection
2	43 EURO
5	82 EURO
10	114 EURO
30	172 EURO
50	282 EURO

the amount of this fee is corrected by a coefficient of degressivity taking account of the number of connections.

2.2.2.2 – For the bilateral fixed links, the fees are given as in § 2.1.2.2.

## 2.3 – Network using exclusive frequencies

The annual amounts of the fees are specified, after opinion of the ministry in charge of the budget, in the schedule of conditions annexed to the decree relating to the authorisation.

The management fee is fixed at 7 622 EURO.

For the private use networks, the fee for availability of frequencies, by channel of 12,5 kHz duplex, is 5 717 EURO for Paris and Ile of France and 60 980 EURO for all France.

## Hungary

### General Fee Policy

In Hungary, according to the Act on Frequency Management, different fees shall be charged for frequency reservation and for frequency usage.

The system of frequency fees is based on the principles of Administrative Incentive Pricing. It reflects the value of the spectrum used as well as the amount of spectrum used.

The frequency fee depends on the service, the frequency band, the amount of the channels assigned, the channel spacing used, the coverage area and whether shared or exclusive frequencies are assigned

The revenues of fees cover the work and development of frequency management and other services provided by the Communication Authority, Hungary in the field of radiocommunications.

## PMR

In the PMR area each frequency user, who obtains a radio licence, pays a frequency fee:

- one-off fee for frequency reservation and
- monthly fee for frequency usage

The Hungarian legislation defines two cases for calculation of fees, depending on the frequency application. The first one gives a possibility to calculate the fees for PMR networks and stations using frequencies assigned for one particular area. In this case the Communication Authority has no information about the number and the sites of the base stations in advance. We can use another model for the calculation of fees for networks and stations using frequencies assigned for a specific site, or sites.

These models use the spectrum tariff unit (1 kHz) in relation to the permitted area or to the parameters of the radio station as well as the amount of equipment in the network.

### 1<sup>st</sup> model

The PMR network, which is going to work in 380-790 MHz frequency band in a permitted area. The frequency user is allowed to develop network continuously during a long time.

#### Reservation fee:

- 38 - 1938 EUR, depending on the permitted area

#### Monthly fee for usage:

- fee of a base station 0,02 - 35 EUR/kHz, depending on ERP (0,1-250 W) and height of the antenna (10-1000 m)
- fee for a piece of equipment:
  - base station equipment 19 EUR
  - fixed station equipment 11 EUR
  - mobile equipment 0,3 EUR

### 2<sup>nd</sup> model

The PMR network, which is going to work in 380--790 MHz frequency band with permitted base station sites. The frequency user is allowed to build network within one year.

#### Reservation fee:

- 11 - 185 EUR, per simplex channel

#### Monthly fee for usage:

- fee for a base station 0,5 - 77 EUR per 25 kHz simplex, depending on the permitted area
- fee for a piece of equipment
  - base station equipment 19 EUR
  - fixed station equipment 11 EUR
  - mobile equipment 0,3 EUR

There is no difference between the fee for the first year and for subsequent years.

## Transparency

The fee calculation scheme was published by the Ministry of Transport, Communications and Water Management.

## The Netherlands

### Policy framework

The Radiocommunications Agency (RDR) is an *executive* Agency within the Ministry of Transport, Public Works and Water Management. The independent status of an Agency means that RDR is free to deploy its resources (including personnel) within a given constraint. The main tasks of RDR are:

- Frequency management.  
This are activities at the creation, planning and issuing of frequencies.
- Standardisation of telecommunications equipment.  
The goal is efficient use of the frequency spectrum and meeting the standards for electromagnetic compatibility (EMC); this means that all items of equipment must work together without mutual interference, from electric shavers to radar equipment
- Enforcement of the frequency usage arrangements  
These are activities which contribute to ensuring compliance with the rules and relating to the use of the airwaves and of equipment.

RDR operates within the policy framework of the Directorate-General for Telecommunications and Post (DGTP). The Directorate General for Telecommunications and Post (DGTP) formulates the government policy in the field of telecommunications (and postal services). RDR *implements* that part of the policy which is related to the structuring of the radio spectrum.

The distinction between policy and its implementation will lead to productive efficiency: a more effective, flexible and efficient operational performance of the RDR.

### General Fees policy

RDR covers its costs operationally. The central plank of the fees policy is the commitment to 100% cost-efficiency per product group. RDR adopts the principle of that the beneficiary pays for the costs of the Agency. Positive and negative results per product group are taken into account when determining the fees for subsequent years. RDR distinguishes the following product groups:

#### **I Categories relating to the use of frequency space**

- A Fixed links
- B Mobile communication
- C Mobile public telephony and public paging
- D Radio determination
- E Amateur radio operators
- F Broadcasting

#### **II Categories of terminal equipment and radio transmitters and other equipment**

- A Examinations
- B Issue of type approval and inspection certificates and certifications
- C Terminal equipment

In general the tariff has two components

- one-off licence fee
- annual costs for enforcement

#### ***One-off licence fee***

This fee reflects the once-made costs for issuing the licence such as frequency planning and management, international co-ordination, administrative costs and investment in equipment. Also the indirect costs of staff departments such as the communications department and legal department are a part of that tariff. The one-off licence fee is cost-oriented and is not to be confused with the amount to be paid in case of an auction (see below).

### ***Annual costs for enforcement***

Every year a licence holder pays for the efforts for enforcement. These are activities which contribute to ensuring compliance with the rules and relating to the use of the airwaves and of equipment.

Every year the Minister approves the highness of the tariffs. Tariffs are published in the 'RDR Charges Order 2000' (<http://www.rdr.nl/pdf/tarieveneng.pdf>).

### **Auctions**

The new Telecommunications Act determines that in case frequencies for new services are issued these frequencies will be divided by means of an auction or beauty contest. In principle there is a preference for the instrument auction in case of (expected) scarcity. According to the current policy this is the case to all licences in the category of commercial use and commercial broadcasting. Licensing by way of the competitive test procedure can only take place 'if it fosters general social, cultural or economic interests' (Frequency Decree, Article 3, paragraph 2). As a result in 1998 frequencies for GSM and DCS1800 were auctioned and recently in July 2000 The Netherlands auctioned the 3<sup>rd</sup> generation mobile telecommunications frequencies (UMTS).

#### *Absolute minimum price*

Recently a proposal has been sent to Parliament to secure a certain minimum price when a licence is issued. This as a result of the by some regarded disappointing auction proceeds of the latest UMTS auction. In the future, in case of new licences are issued that minimum price has to be paid, regardless of the number of bidders, or even in case there is technically no scarcity (number of bidders  $\leq$  number of licences). The minimum price itself, in a way, must reflect the value of the spectrum. This also should be applied in case a beauty contest is being held.

#### *Auction does not effect the cost-based fee structure of RDR*

The policy to have an auction in case of (expected) scarcity does not change the general policy of cost based tariffs as explained above. The proceeds of the auction go directly to the State Department (Ministry of Finance). At the same time during the total licence period the licence holder falls under the cost-based regime (retributions to RDR).

### **Administrative Incentive Pricing (AIP)**

In 1999 RDR conducted a research on the possibilities of implementing Administrative Incentive Pricing (AIP) in The Netherlands. AIP has no legal basis in the current Telecommunications Act. Therefore strong arguments had to be found in favour of a (possible) implementation of this concept. The conclusion was that as a result of the above mentioned policy of auctioning scarce frequencies as a first option the number of applications for AIP was not great. To apply both auctions and at the same time AIP for the same licences was not considered an option. Also there were no convincing reasons for applying AIP for current applications such as PMR and fixed links because there were no apparent scarcity problems (or foreseen problems) in these regions. Therefore it is not expected that AIP will be implemented in a short period of time in The Netherlands.

### **PMR**

The basic structure of the PMR fees in the Netherlands is as follows:

- charging a fee per base station per year and
- charging the number of mobiles being into use per year.

#### *Implementation Telecommunications Act 1998*

In 1998 the new Telecommunications Act (TA) entered into force. In that Act, a basic change in philosophy had been adopted. Before 1998 it was possible to issue licences for the possession and use of *equipment*. After the implementation in 1998 only licences could be issued *for the use of spectrum* and not for the possession and use of equipment.

*Transition period fee structure PMR*

Regarding to PMR this gave a possible problem for the existing PMR fee-structure because it was based on the number of mobiles being used. Nevertheless, the basis structure was not changed. Although, legally speaking, RDR could not oblige licence holders to inform RDR about the number of mobiles they having into use anymore (licence was now for use of frequency and not for the possession of equipment (mobiles)), RDR argued that licence holders still had to inform RDR about the number of mobiles having into use because that was necessary for a proper frequency planning. This obligation should be temporary, because in the near future the network of monitoring stations in the Netherlands could overtake this task. Therefore for the coming period a transition fee structure is applied where over a number of years, the fee per base station is being raised and the fee per mobile is lowered. Eventually only a fee exists for the use of base stations. After 1998 the change in fees can be illustrated as follows:

	<u>1997</u>	<u>1998</u>	<u>1999</u>	<u>2000</u>	<u>2001</u>
• Fee per base station	400	500	560	570	597
• Fee per mobile	90	65	40	36	29

Meanwhile RDR is considering the possibilities of a new fee structure for PMR. The following two approaches are considered:

- a fee per base station related at the radius of the coverage aria of that base station,
- a fee related to the number of square kilometres (km<sup>2</sup>) per base station.

**Market structure PMR**

In general there are no scarcity regions regarding to PMR in the Netherlands. In effect, even the intensity of use of PMR, regarding to our monitoring department, is declining. Officially, although, the number of licences stays constant.

*External market investigation PMR/PAMR*

RDR foresees a further (even drastically) decline in use of PMR in the future (2005-2010). Therefore RDR starts an investigation of the developments in use of PMR in relation to PAMR for that period. The result will be to develop a new frequency plan for PMR and PAMR. Shortly speaking, the study will determine whether the frequency band 450-470 which is now reserved for PMR will than be allocated exclusively for PAMR. Reasons for the foreseen decline in use of PMR are:

- the growth in use of TETRA (Traxys)
- growth in use of general licence free regimes like DECT, Short Range Devices and RLANS
- use of GSM/UMTS

Besides to determine the *quantitative* use of PMR in the (near) future also the research will investigate certain demands of the market in *qualitative* terms like the desire to have more semi-duplex use in stead of the now general applicable simplex allocation of PMR.

In the first half of 2001 two licences for TETRA will be issued. Fore these licences a beauty contest will be held.

**Norway**

**General fee policy**

The fees for radio licenses are cost based with certain tariffs models for the different radio services. The fees shall only cover the administrative costs incurred in the issue, management, control and enforcement, including overhead costs. The basis of the calculation of the fees is the budget of the Norwegian Post and Telecommunications Authority that is approved by the Parliament yearly.

The fees are divided into two categories; standardised and individual decision fees, both covered by a regulation for fees;

**The standardised fees** are stipulated in the regulation. They usually refer to the number of stations, the frequency band or the channel bandwidth used. Standardised fees are annual fees or one-off fees. Annual fees apply to licences granted and registrations made before 1 October in the year of application and registration. Licences granted for six months or less are payable at half of the annual fees.

**The individual decision fees** relate to the rights or duties of one or more specified persons or companies and are set as administrative decisions. They are typically used for large companies with activities in several radiocommunications areas or companies licensed for nation wide use of frequencies or frequency blocks. These fees are settled each year on a cost-oriented basis.

Grounds shall be given for these individual decisions. The telecommunication authority shall state the grounds at the same time as the decision is made. The authority try to keep the individual decision fees stable from year to year. The grounds shall also mention the factual circumstances upon which the administrative decision is based. Mention should be made of the chief considerations, which have been decisive for the exercise of the discretionary power of the authority.

The exception from the general fee policy is the public mobile networks where the Ministry of Transport and Communication in addition imposes a fiscal fee for the use of frequencies.

### **PMR fees**

A PMR licence holder pays a yearly fee based on standardised fees for each mobile and base station. The standardised fees are stipulated in the regulation. The PMR fees contain no payment for the amount of spectrum used, shared or exclusive channel, or coverage area. The fees for 2001 are 37 Euro for each mobile station and 186 Euro for each base station independent if operating on a co-operative basis or not.

For large nation wide PMR network the fees are laid down in individual decisions based on the total administrative cost.

A new regime for PMR fees is now under study. The basic element will be the use of spectrum and the coverage area in the sense of a fee for each additional base station. Fees for mobile stations will cease. The new fee structure will be implemented from 2002.

## **Spain**

### ***General fee policy***

Fees asked for the use of frequencies for public and private use are charged annually. The income derived of these fees will be used for the financing of research and training in the telecommunications area and for the fulfilment of certain public service obligations. In order to establish the level of the fees, the market value of the use of the frequency as well as income that the user could derive with the use of the frequency will be taken into account. In establishing this market value and the profitability, the following elements are considered:

1. level of use and congestion of the band
2. the type of service for which the frequencies will be used (private or public)
3. the frequency band
4. the equipment and technology used
5. the economic value derived from the use of the frequency.

The fee will be calculated by multiplying the number of so called frequency units with the value that is assigned for each unit.

A spectrum unit consists of the potential or real occupation of 1 kHz bandwidth over an area of one square kilometre. When there is a limited number of licences that are given out via beauty contest fees are established separately by Ministerial Order.

The collected fees will flow into the state budget, but the income will be earmarked to cover the costs of the licensing system.

### ***Fees for Licences for PMR***

In calculating the fees for PMR the 5 criteria listed above are taken into account, but fees are differentiated on the basis of the following additional criteria: fixed assignment or random assignment, shared or exclusive frequency, own use or third party service and congested area or non congested area (if the network covers areas, where at least 50 000 inhabitants live).

For all of above mentioned cases tables with different frequency bands have been developed on the one hand and the 5 criteria on the other hand. For each situation different fees are calculated

## Switzerland

### General fee policy

The Swiss fee-setting system has the following characteristics:

#### a) **The Swiss fee-setting system is a dual fee-setting system**

The Swiss dual system is a system including both a cost-covering fee-setting system and a fee-setting system based on non-financial criteria (resource oriented). They are respectively composed of the *basic administrative fees* and the *incentive spectrum fee*, which have the following characteristics:

- *Basic administrative fees* (which includes the one-off administrative fee and the spectrum management fee)

Their aim is to cover the costs occurring to the administration when the latter acts on request of or due to the conduct of an individual. Their scope is defined by two principles, which limit the amount an administration can charge an individual, when the latter requested an action from the former: (1) the cost-covering principle, and (2) the proportionality principle.

- *Incentive spectrum fee*

Its aim is to be a return to the State by individuals who have been granted the right either to perform an activity actually reserved to the State or to use a common property on a more extensive basis. Its scope is solely defined by economic thoughts and should reflect the economic value of the regalian right which is leased to the user (which include spectrum pricing). This fee is cost-independent and is used to implement AIP. The height of the fee will consequently be based on spectrum management considerations.

#### b) **The Swiss dual fee-setting system is a system which makes the conciliation of AIP and the fundamental legal principles for the setting of fees (cost-covering and proportionality principles) possible**

The dual fee-setting system is a solution aiming at full transparency. Indeed the basic administrative fee is aimed at paying well determined activities of the administration in the field of a peculiar radio application of which radio licensees are the direct/indirect cause. The licensee can easily recognise his profit out of those activities. Furthermore, the clear separation of the basic administrative fees is important as they are submitted to a very stringent legal framework. On the other hand the incentive spectrum fee, which is only to pay by a minority of users, implies *inter alia* that the privilege to use the public good "radio-frequencies" is not given for free to a licensee if the use doesn't profit the community as a whole. Last but not least the incentive spectrum fee is the fee for whose setting AIP is applied.

### Fees for Licences for PMR

#### 1. One-off Administrative Fees (for all PMR users)

The administrative fees for the issuing of the radiocommunication licence are calculated on basis of art. 10 para. 1 (users in the aeronautical and maritime sectors), art. 11 para. 1 (paging equipment) and art. 12 para. 1 and 2 (other PMR applications) of the Decree of the Federal Department of the Environment, Transport, Energy and Communications on Fees in the Field of Telecommunications of 22 December 1997 (*Verordnung des UVEK über Gebühren im Fernmeldebereich/Ordonnance du DETEC sur les redevances dans le domaine des télécommunications*).

These fees are fixed, e.g. independent from the costs effectively occurred to issue the specific individual licence. However their height is based on the previous average cost for the issuing of radio licences of these categories.

#### 2. Monthly Administrative Fees (for all PMR users)

For users in the aeronautical and maritime sectors and for paging equipment these fees are fixed (respectively art. 10 para 2 and art. 11 paragraph 2 of the Decree of the Federal Department of the Environment, Transport, Energy and Communications).

For other PMR applications, the amount of the monthly administrative fees (frequency management fees) is calculated on the basis of the frequency class, the geographical coverage and the assigned bandwidth of the licence (art. 12 paras 2-5 and art. 13 and 14 Decree of the Federal Department of the Environment, Transport, Energy and Communications).

#### 3. Incentive Spectrum Fees (only for minority of PMR users)

On the basis of article 39 TCA the Decree on Fees in the Field of Telecommunications of 6 October 1997 (*Verordnung über Gebühren im Fernmeldebereich/Ordonnance sur les redevances dans le domaine des télécommunications*) has been adopted. Article 16 to 21 of this decree deal with licensing fees for radio spectrum allocated to PMR.

Art. 16 of the Decree lays down the ordinary licensing fees for radio spectrum allocated to PMR. Art. 19 of the Decree deals with the fees for users in the aeronautical and maritime sectors. Finally art. 20 of the Decree lays down the licensing fees for paging equipment.

Present fees for radio spectrum allocated to PMR are historically based on a fee calculation scheme laid down by the incumbent operator. This scheme unfortunately includes a quantity discount, i.e. the broader the bandwidth assigned, the cheaper the frequencies become when their cost is viewed relatively to narrower bandwidths (see table in art. 11 para. 2 of the Decree). However they may be subject to modification in the coming years.

It is also important to point out that in Switzerland art. 26 to 28 of the Decree - flowing from art. 39 para. 4 of the Telecommunication Act (TCA) of 30 April 1997 - free a number of licensees from the obligation to pay radio licence fees (i.e. authorities, transport services, and diplomatic missions).

### **Swiss Market structure**

Private Business Radio in Switzerland is the use of a mobile radio system, owned and operated by an organisation or business to enable it to carry out its own business purposes. The use of the frequencies in order to offer telecommunication services to third parties is excluded. No distinctions are made as to the geographical coverage authorized by the licence (national, regional or on-site) or the type of information carried by the frequencies (speech or data). The former characteristic will however have an influence on the height of the incentive spectrum fee.

As has already been mentioned above, the Swiss legislator decided to free authorities, public transport services, and diplomatic missions from the obligation to pay radio licence fees. **In Switzerland 55% of PMR licences are held by such authorities (public safety and non-emergency services) and public transport services. They are accordingly exempted from paying the incentive spectrum fee. Thus, only a minority of PMR-licensees pays the incentive spectrum fee.** All are however subject to the payment of the basic administrative fees.

## **UK**

The authority to set fees in the UK is through powers given in the Wireless Telegraphy Act of 1998. The Secretary of State for Trade and Industry is required when setting fees to consider the availability and demand for spectrum, the desirability of promoting spectrum efficiency, economic benefits, innovation and competition.

The powers contained in the 1998 legislation enabled the UK to move away from a regulatory regime in which the fees recovered by the Radiocommunications Agency were only those required in order to recover the costs of running the Agency to a regime in which fees requested are based upon a declared value for the radio spectrum.

PMR fees within the UK are now levied within a framework, which determines an economic cost for radio spectrum based upon comparative costs for the provision of alternative services. The cost of spectrum to users, is further differentiated according to the availability of spectrum. This in turn is calculated according the radio band being used, the geographical location (whether there is congestion of radio) and the type of business using the spectrum.

The new legislation allowed the fee setting process to be carried out through a process of administrative pricing or through the use of auctions. The new fee regime is based upon a commitment by the Agency to a culture of openness and transparency in the ways in which it will price its spectrum. Within the PMR sector there is a clear expectation that fees will be set using a process of administrative pricing and existing operators have been re-assured that they will not be required to enter auctions to continue to provide their existing services within their existing spectrum assignments. The first two phases of Spectrum Pricing have been carried out, with Phase 3 due this year. In the PMR sector, Phase 1 enabled the removal of fee distortions for users of on-site users who under previous arrangements had been charged a disproportionate amount for fees, compared to mobile telecommunications operators.

### **UK Market structure.**

Private Business Radio in the UK is the use of a mobile radio system, owned and operated by an organisation or business to enable it to carry out its own business purposes. The licences granted to these users do not allow these operators to offer radio capacity to users outside of the organisation licensed. The UK Radiocommunications Agency licences its users under the following main licence classes:

#### **National and Regional Licences**

Provides certain users with exclusive (non-sharing) access to spectrum using specific channels on a UK National basis. Users in this category tend to be large (e.g. Government, Utilities, Transport) with a requirement to operate over a large area. Most users of trunking systems are in this category.

#### **Wide Area Private Business Radio**

Wide Area Private Business Radio covers systems with a range of more than 3 kilometres. (on a shared –spectrum basis). This category covers a wide range of systems types and sizes and a wide range of applications. It includes small local users using a single base station and a small number of mobiles, as well as major companies using a multi –trunked systems with possibly hundreds of field operatives. Speech is the dominant method of communication, although the use of data, particularly for the transmission of standardised messages is increasing.

**On- site Private Business Radio**

On-site Private Business Radio systems are typically used to provide communication with personnel on the move within an organisation's own site, such as factories, warehouses and shopping centres. Transmit powers and antenna installations are normally restricted to provide ranges of 3 kilometres or less. There are a limited number of licences with several hundred mobiles and portables on a single site but the majority make use of 10 or less. Speech is the dominant method of communication. Included in this category are On-site Paging systems used for one to one communication, which are often linked into an organisation's telephone systems.

## Annex III

**Analysis of its cost structure for PMR by the Swiss administration (see Chapter 11.3.2, p.11)**

For the Swiss administration the analysis of the structure of its costs in the field of PMR (as well as in the other radiocommunication sectors) is central in order to ensure the legality of the basic administrative fees according to Swiss law.

<b>list of tasks concerning PMR regulation</b>	<b>duration of task</b>	<b>hours to work per year (plan 2001) – relevant portion PMR</b>	<b>type of costs</b>
<b>1. Spectrum engineering support</b> (basic work)			
Assessment of technical developments and systems capabilities (studies of principles/basics of new radio technologies)	currently	195	Indirect costs
Interference assessment (compatibility studies of new and existing radio technologies)		128	
EMC assessment (basics of electromagnetic compatibility (technical))		150	
basics of electromagnetic environmental compatibility (biological and technical)		128	
<b>2. International Co-ordination/Co-operation and frequency planning</b>			
participation in ITU	currently	503	Indirect costs
participation in CEPT and EU		863	
preparation of the national frequency allocation plan		473	
(international) agreements concerning frequency use		130	
<b>3. Frequency assignment / licensing</b> (authorisation for use)			
bilateral or multilateral agreements concerning preferential terms of frequency use	30 days max. per license	9'750	Direct costs
theoretical compatibility analysis of new radio networks or technical changes in existing networks			
intensity of use measurement in assigned bands			
preparation of a theoretical solution			
assessment of planing parameters through field measurements of co-existence possibilities with existing transmitters/receivers			
assessment of planing parameters through field measurements of co-existence possibilities with existing radio networks (more extensive)			
preparation of the technical license specification			
Renewal and cancellation of licences		8'000	direct costs
issuing licenses and collecting fees (support service, accounting, information)			
<b>4. Licence maintenance and service</b>			
quality control of frequency bands (illegal users, transmitting discipline)	currently	1'500	direct costs
determination of interferences and its source (analysis, monitoring, field measurements, arrangements)	approx. 18 hours per case (on average)	3'200	
24-hours-service (contact point) for security services	currently	0	no additional costs!
sourcing and maintenance of measurement equipment and systems	currently	3'975	indirect costs
<b>5. Overhead</b>			
division + office management and administration (projects inclusive)	currently		overhead costs
<b>6. Additional costs to allocate</b>			
Write-offs (inclusive technical equipment)			indirect costs
financial contributions to international organisations			indirect costs

**costs per year (plan 2001):** Not all amounts are available at the moment because of restructuring of our cost accounting system. The PMR total costs should be approx. from 9 to 11 million CHF. (It depends on the definition of apportionment of indirect costs.)