



Electronic Communications Committee (ECC)
within the European Conference of Postal and Telecommunications Administrations (CEPT)

**COST ALLOCATION AND ACCOUNTING SYSTEMS USED TO FINANCE
THE RADIO ADMINISTRATION IN CEPT COUNTRIES**

Dublin, September, 2004

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1 INTRODUCTION

1.1 Main objectives of the work

The overall objective of this report is to “study the different cost allocation and accounting systems used in CEPT countries to finance the radio administration with a view to providing an informative overview” on the subject. In particular, the work should provide some answers to the following questions:

- How are activities related to the spectrum management functions (as defined in Chapter 1 of the ITU Spectrum Management Handbook) being financed in CEPT countries;
- What relationships exist between the income derived from fees or otherwise and the costs incurred by spectrum management activities?

It is common knowledge that the radio administration/spectrum management is being dealt with differently in CEPT member countries. In some cases a “Radio Agency” is in charge of all spectrum management related activities, while in others responsibilities may be shared between several organisations such as a Ministry, an NRA and possibly a separate frequency management body. The funding situation therefore varies depending on the set-up within each CEPT Administration.

In addition to the differences in the way activities are shared between different entities at national level, the actual definition of spectrum management activities may vary from country to country, and to some extent even the definitions of fees, charges, administrative and otherwise, may cover different concepts in different administrations. Despite the complexity or variety of scenarios that exist, the information gathered and analysed in this report seems to provide useful insight into specific financing models, and gives some indication of the existing national situations. In fact, despite the variations noted, it has been possible to define five main financing models, which are described in section 2.

By unveiling the relationships between costs incurred and fees and charges collected in the different financing models, the investigations also highlight the difference between fees and charges, the way they relate to specific costs elements and how those costs may be distributed among users via specific keys which ultimately lead to charges and/or fees. It should also be noted that a worldwide survey carried out by ITU-D Study Group-2 on related spectrum fee issues is being finalised, providing complementary information on the subject.¹

Further to providing a picture of the funding situation of radio administrations in CEPT, the investigations also reveal useful information on the changes that are taking place or will take place in the near future in a number of administrations, in particular with regard to the implementation of the EU package and the need to redefine the way fees and charges are set.

The resulting overview of systems in place and possible future developments with regard to the financing of the radio administration should therefore provide some help and guidance for Administrations that need to address financing and fees issues.

1.2 Definitions

In this report a number of concepts are used that need clarification. The following definitions have been applied for the purpose of this study.

Spectrum management: means “all activities carried out with the aim of giving access to spectrum for the largest possible group of interested parties, in due time, while ensuring the overall efficiency of spectrum use and avoiding harmful interference”. (*ECC Report 016*).

This includes licensing, enforcement and monitoring activities.

Radio administration: is understood as activities dealing with spectrum management.

¹ ITU-D Study Group 2, Joint Group on WTDC-98 Resolution 9 Rev. 02. (See: http://www.itu.int/ITU-D/study_groups/SGP_2002-2006/JGRES09/Res9_Index.html)

Spectrum management organisation (SMO): national entity dealing with some or all aspects of spectrum management.

Fees: price charged by the administration to a licence holder for the grant of rights of use of spectrum, with the aim of achieving certain spectrum management objectives such as to ensure the efficient use of that spectrum. Fees are not primarily intended to cover the costs of the SMO and may be charged once-off or yearly.

Charges: refers to administrative charges, i.e. price charged by the administration to cover administrative costs incurred in the management, control and enforcement of the authorisation scheme (this may include costs for e.g. international cooperation, harmonisation and standardisation, monitoring and enforcement).

Note

In some administrations, the money received from auctions or beauty contests is considered a fee. In other cases, such money may also cover the costs of organising the selection procedure which means that it has both a fee and a charge component. In other cases, money from selection procedures is neither considered a fee nor a charge, but a purchase price for the right of use of spectrum.

Incentive pricing: method used to set a fee for the right of use of spectrum that reflects a certain value for that spectrum, in order to achieve certain spectrum management objectives.

Cost-accounting/ cost-allocation system:

A cost-accounting or cost-allocation system is a model that clarifies the costs of the SMO for a certain type of activity or certain group of licence holders. Ideally the charge that is passed to the license holders can be clarified or explained by the cost-accounting/allocation system.

For the purpose of this report, the term “cost-allocation system” was chosen.

1.3 Information collected

A questionnaire was sent to CEPT Administrations in the first half of 2003 and the following 21 Administrations responded:

Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Hungary, Ireland, Latvia, Lithuania, Malta, Netherlands, Poland (Ministry and Office of Telecommunications), Portugal, Romania, Sweden, Switzerland, Turkey, United Kingdom.

Liechtenstein could not provide any information as relevant legislation is under preparation.

2 FINANCING OF THE RADIO ADMINISTRATION

The funding of the radio administrations varies greatly from country to country. Administrations may be financed solely by fees and charges or to various degrees by a mix of state budget and fees and charges. Others may only be financed by the state budget. In all countries though, fees and/or charges are being collected and charges may or may not be based on an accounting system.

Despite the variety of scenarios encountered, five basic models of financing spectrum management activities can be identified based on responses to the questionnaire sent to CEPT administrations.

General explanation

Each of the funding models presented below has the following structure:

In the middle there is the Spectrum Management Organisation (SMO). The SMO deals with the general spectrum management tasks such as planning, coordination, international work, licensing, enforcement, etc. Most countries have such an organisation. In general, the SMO is an executive body which implements the policy determined by a ministry.

Left of the SMO is the Ministry. Although the spectrum policy is often defined in cooperation between the ministry and the SMO, it is normally the ministry that is responsible for making final decisions on the overall

spectrum policy. The money that comes from the ministry (or other governmental bodies) is called here ‘the state budget’ or ‘general budget’.

In the right of each chart is ‘the market’ which represents all ‘licence holders’. With regard to fees and charges they receive ‘a bill’ which they have to pay.

Cost-allocation systems

A cost-allocation system is a system that clarifies the costs of the SMO for a certain type of activity or certain group of licence holders. Ideally the bill that is sent to the license holders can be clarified or explained by the cost-accounting/allocation model.

The role of cost-allocation systems in some of the funding models presented below is two-fold:

- for internal use: cost-allocation system used to clarify or justify the costs of the organisation to the ministry or other governmental bodies which finance the spectrum management organisation.
- for external use: cost-allocation system used to clarify the costs of the organisation to ‘the market’ or license holders who receive a bill from the spectrum management organisation.

In most cases a cost-allocation model is absent.

Fees and charges

The ‘bill’ that is sent to the market (or to the licence holders) may have three forms and reflect:

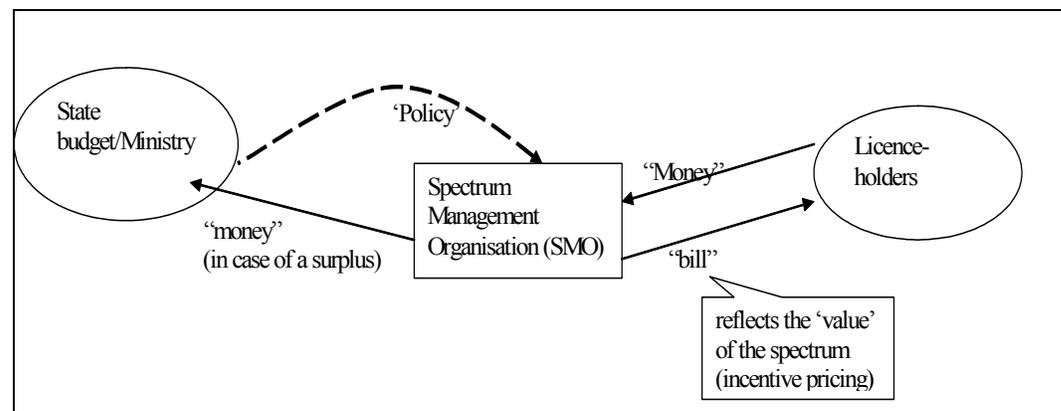
- *the costs* of the SMO (‘charge’)
- the value of the spectrum or other policy considerations (independent of the costs, i.e. a ‘fee’)
- both the costs of the SMO and the value of spectrum (i.e. *a charge* combined with a ‘*fee*’ component).

2.1 Financing models

The five basic financing models that have been identified are presented below.

Model 1: Fee-based model

- Bill reflects the ‘value’ of the spectrum
- Money is transferred directly to the SMO
- Surplus is transferred to the state budget



Explanation:

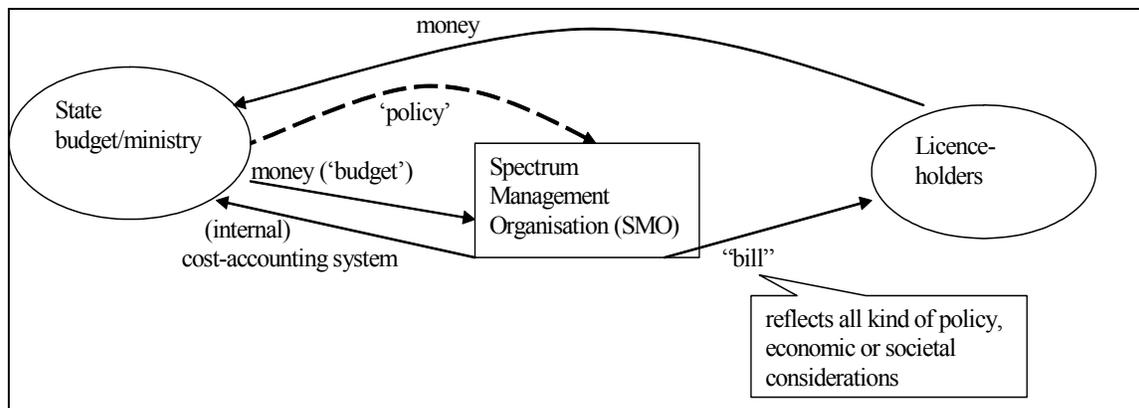
In this model the bill sent by the SMO to the market reflects the value of the spectrum or other market considerations. The primary objective by setting the price is not to recover costs, but to reach certain spectrum management goals (incentive pricing). The money from licence holders goes directly to the SMO. In case of a surplus, this money is transferred to the state budget.

Examples:

- United Kingdom.

Model 2: State-financed model

- Bill reflects all kinds of policy, economic and societal considerations
- Money is transferred directly to the state budget
- Costs of SMO are borne by the state budget/ministry.



Explanation:

In model 2, the bill that is sent to the market *does not* specifically reflect the market value of the spectrum or the costs of the SMO, but is set according to general policy, economic or societal considerations at what is considered as a 'fair' price. In this model, all the money collected from licence-holders goes directly to the state budget or to the ministry. The costs of the spectrum management organisation (SMO) are borne by the ministry (or state budget). An internal cost-accounting system may be used to determine the costs of the SMO.

Example:

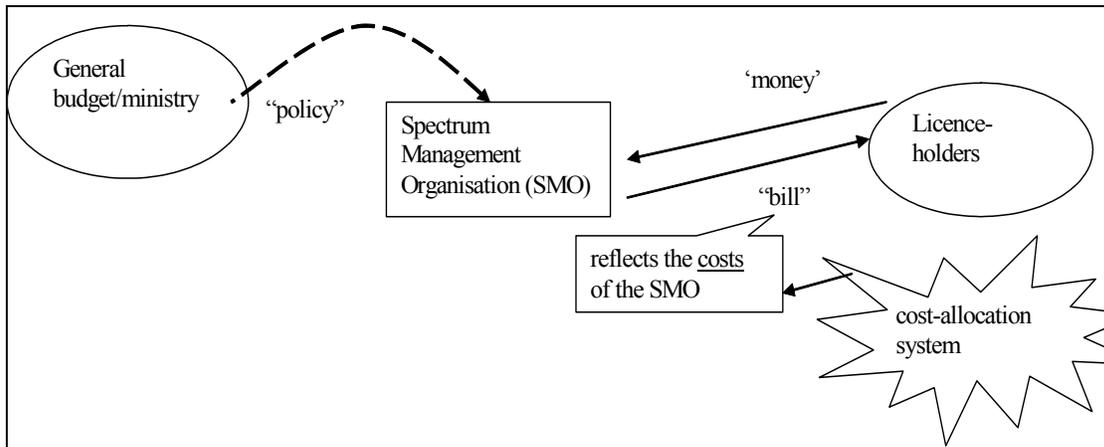
- Cyprus
- Denmark
- France
- Czech Republic
- Malta
- Poland

Note:

Model 2 applies to Denmark with a slight variation. As in model 2, the Danish SMO is financed by the state budget, fees are paid directly to the state budget, but in some specific areas administrative charges are paid by the licence holder to the SMO directly and cover some of the SMO costs.

Model 3: Charge-based model with cost-allocation system

- Bill reflects the costs of the SMO on the basis of a cost-allocation system
- Money is transferred directly from licence holders to the SMO.



Explanation:

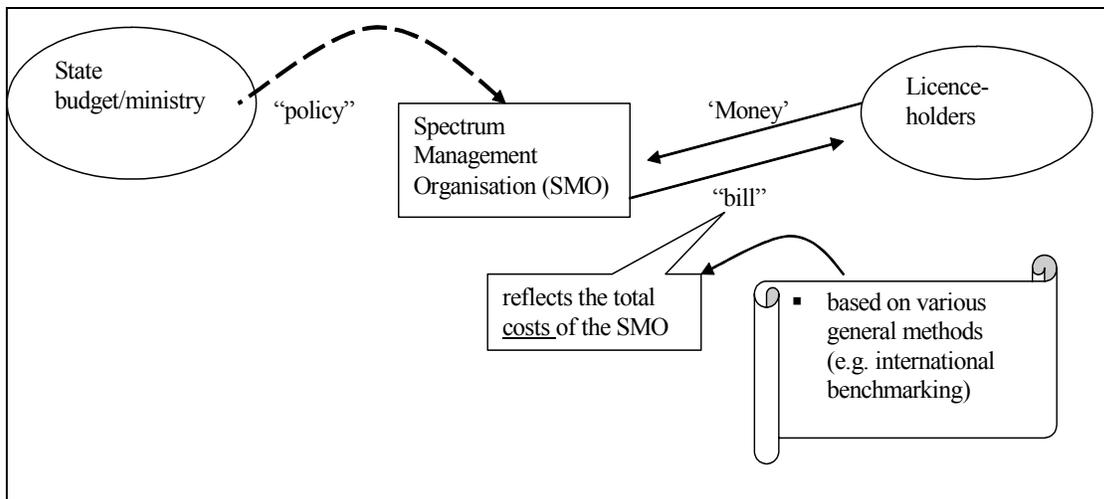
In this model the bill reflects the costs of the SMO (the efforts of the SMO on behalf of the licence holders). In an ideal situation a cost-allocation system is used to give insight into the costs of the SMO and how the bill is derived from these. The bill is sent out by the SMO and the money is paid directly to the SMO. The SMO executes the frequency management within the boundaries of the general policy determined by the policy-making department (Ministry).

Examples:

- Netherlands
- Sweden.

Model 4: Charge-based model without a specific cost-allocation system

- Bill does not necessarily reflect individual costs of a license holder or group of licence holders.
- Total payments of licence holders reflect total costs of SMO.
- No specific cost-allocation system is used.



Explanation:

Here the total of all bills that are sent out reflects the overall costs of the SMO. However, each bill is not based on a specific cost-allocation system, but on all kinds of general methods such as international benchmarking, distributing the total costs amongst all users or groups of users (based on e.g. the frequency occupation, the part of the bands or other technical parameters). As a result, in this model, some licence groups can be charged lower or higher than the actual costs incurred, as long as the total costs are covered by the total income.

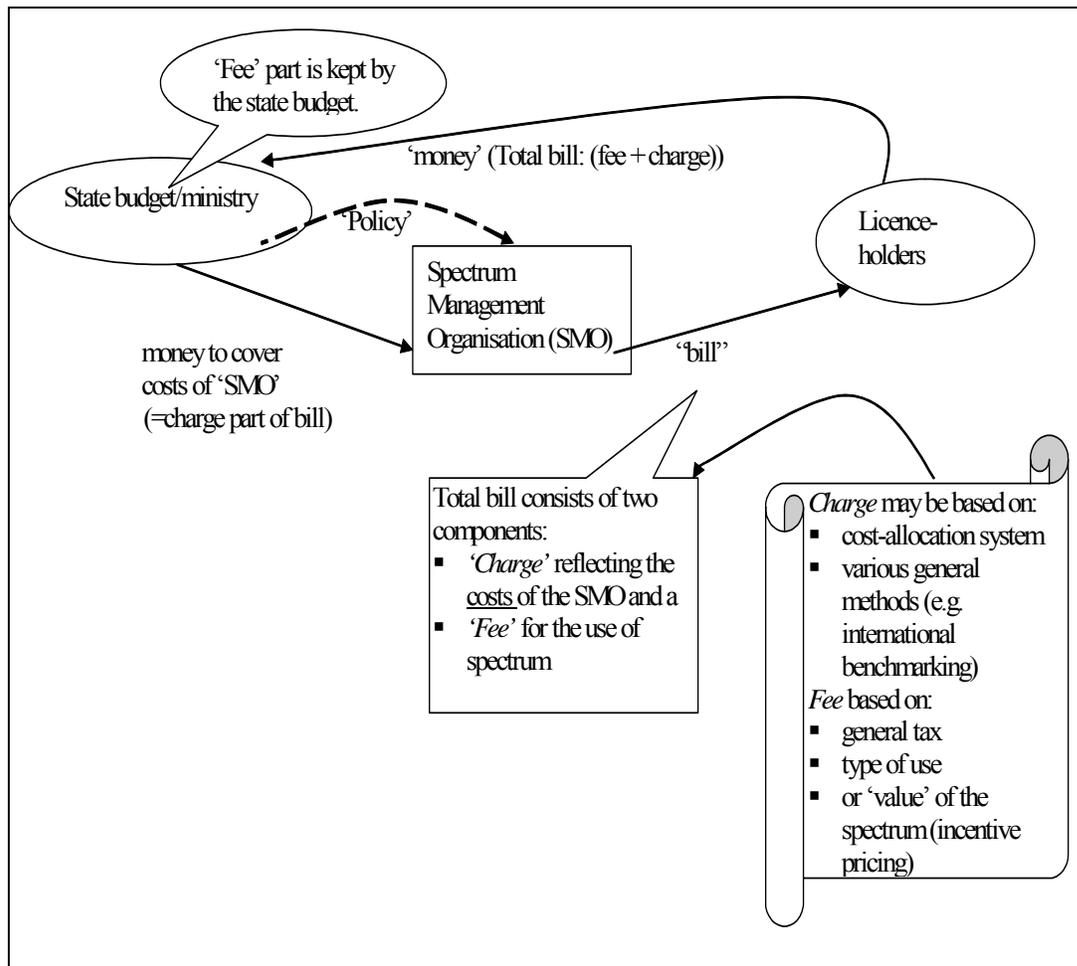
Examples

- Bulgaria
- Hungary
- Finland
- Turkey.

Models 5a and 5b: Hybrid fee and charge-based model

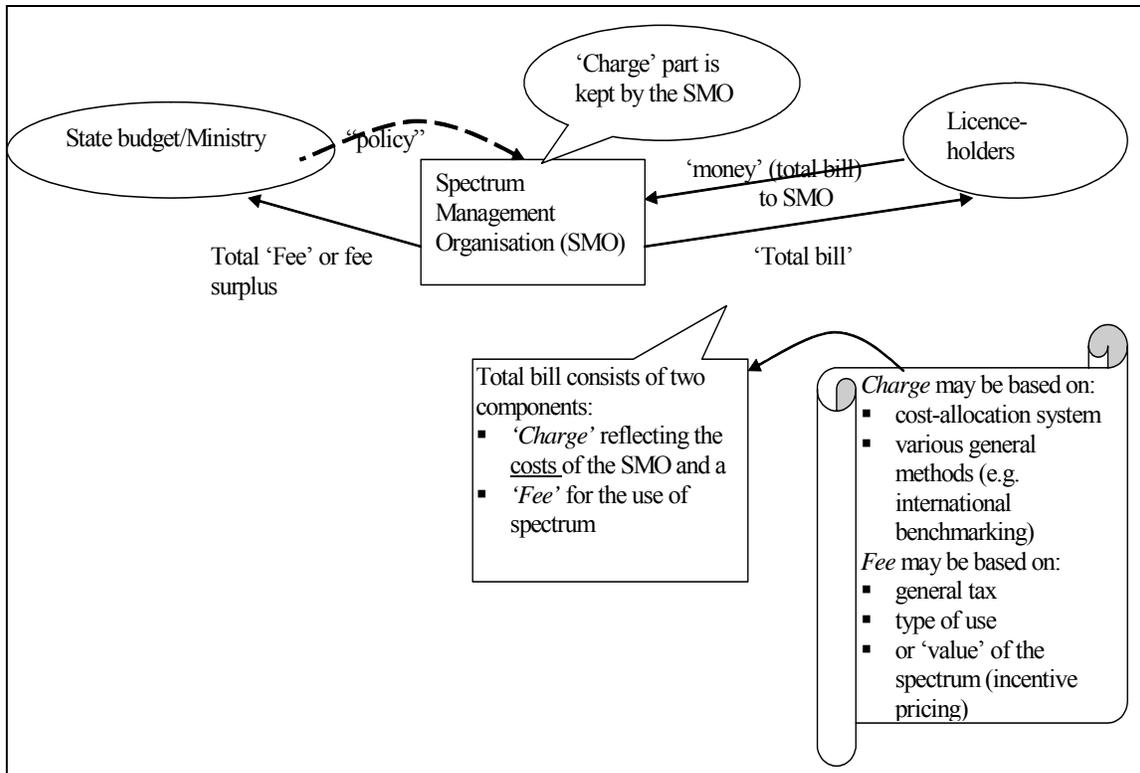
Model 5a:

- Bill consists of both a costs component (charge) and a fee component.
- Money from licence holders goes directly to the state budget.
- Total charges cover total costs of SMO.
- Total fees are kept by the state budget/Ministry.



Model 5b:

- Bill consists of both a costs component (charge) and a fee component.
- Money from licence holders goes directly to the SMO
- Total charges and in some cases also fees cover total costs of SMO.
- Total fees or fee surplus are transferred from SMO to the state budget/Ministry.



Explanation:

In **Models 5a and 5b** the total bill consists of two parts:

- A 'charge' part (cost based part; based on cost-allocation system or based on general methods)
- A 'fee' part (based on value of the spectrum or other non-costs considerations like bandwidth, occupation of spectrum, general tax, etc.).

The money from the licence-holders (payment of the *total bill*) goes:

- in **Model 5a**, directly to the state budget. In that case the money of the 'charge part' of the bill is transferred back from the state budget to the SMO, the 'fee' part is kept by the state budget.
- in **Model 5b**, directly to the SMO. In that case the SMO keeps the 'charge' part for itself and transfers the 'fee part' or the fee surplus to the state budget.

Examples:

- Model 5a: Switzerland, Estonia
- Model 5b: Croatia, Portugal, Ireland, Latvia.

It should be noted that all the above models may occur with slight variations in CEPT countries.

2.2 Specific features of cost allocation systems used

Although the intention of the study is not to go into details of cost accounting systems, some of the features of cost accounting systems used in CEPT administration are worth highlighting. Besides it should be noted that out of the twenty respondents to the questionnaire only five indicated using a cost-allocation system to determine their charges.

2.2.1 Indirect costs

Indirect costs are the least straightforward to take into account for the calculation of charges as they are not directly linked to the work done for an individual licensee. Two main types of indirect costs can be distinguished: overhead costs and costs for international activities.

a) Allocation of overhead costs

A part of the overhead costs (e.g. salary, travel, training) can be recorded against different activities while other overheads (e.g. rent) are recorded centrally and may not initially be allocated to different activities. However, these general costs are allocated to activities based on the number of staff involved or on the number of staff in various departments.

b) Allocation of costs for international activities

Spectrum management typically requires participation in international activities such as for harmonisation and coordination purposes.

Fixed costs for participation in international activities and contributions are incurred by customer groups rather than by individual users. It is therefore most efficient to charge those costs to a whole customer group. This may be done by means of a flat rate within a group. In some cases (e.g. satellite coordination) these activities can be charged to the individual licensee.

2.2.2 Direct costs

Direct costs are costs that can be allocated to individual licensees or groups of licensees as they are directly connected to tasks carried out for those particular licensees.

The costs incurred can be determined using the cost accounting system to register the time spent (and other costs) for those specific tasks. With bulk processes a flat rate can be used to simplify.

2.2.3 Cost recovery principle

Cost recovery per product group or area of activity

Cost recovery per licensee is difficult to achieve, which is why cost recovery per product group or area of activity is used more in CEPT countries.

In some administrations the cost accounting system is used (last and current year) to estimate the expenses for the various tasks of the regulator for the following year per product group or area of activity. An estimation of the number of licences in use and coming into use in the following year is also taken into account when setting the charges. The aim is to share the costs over different categories of licence holders in an equitable way.

Forecast period

Fees and charges are calculated and forecast for periods varying from one to three years. The forecast figures takes into account the expected growth in number of licences.

2.2.4 Difficulties associated with the use of cost allocation systems

It should be borne in mind that there are also costs involved with the setting up, maintenance and daily use by employees of cost-allocation systems.

At first glance it seems that using cost-allocation systems to determine costs and charges should provide the greatest degree of accuracy possible, but, in effect, cost-allocation systems can never be totally accurate. Some time is spent on recording activities rather than on the work itself, some of the time spent may be impossible to allocate to any of the foreseen activity, but still needs to be registered. The more detailed and therefore, in theory, the more accurate the allocation system, the more complex and time-consuming it may become for employees.

In spite of such drawbacks, cost-allocation systems seem to be the most reliable means of approximating real costs and therefore provide a sound basis for setting fair charges.

2.3 Handling of surplus and deficits

For most administrations that responded to the questionnaire there are two different ways in which surplus or deficits are handled.

2.3.1 State budget

The most common option currently found in administrations for handling a surplus is to pass that surplus to the State budget. This concerns in particular Bulgaria, the Czech Republic, Finland, Hungary, Ireland, Lithuania, the Polish Regulator and Turkey. As regards deficits, only two of these administrations responded that additional funds have to be applied for from the state budget or the Ministry of finance. However, the same procedure is likely to apply to the other respondents.

It should be noted that in Finland, up until 2003, a surplus could be kept in the regulator's budget and carried over to the next year. The new rule that obliges the administration to transfer a surplus to the state budget has meant an increased need for accuracy and financial surveillance, with the preparation of an additional budget before the end of the year to reflect the increase or decrease in fees. Further, in Croatia, Latvia and the United Kingdom a part of the surplus may be allocated to the development of spectrum management activities and the remaining surplus goes to the state budget.

A slight variation was found in Portugal where surpluses are registered in the regulator's accounts as reserves. Over the last two years a large amount of these reserves has been transferred to the state budget.

2.3.2 Change in fees and/or charges

In other administrations surplus or deficits are taken into account in the definition of fees and/or charges for the next period. This is the case in particular for Estonia, the Netherlands, Switzerland and Sweden where the charges are increased or decreased to reach a cost recovery level in the next period.

In the Netherlands, a distinction is made between an overall surplus or deficit, i.e. in relation to the total income and expenses of the administration and surplus or deficits for a product group. In the first case, the administration can keep a surplus in reserves within certain limits, while a surplus or deficit for a product group results in a change of charges.

Sweden is the only country where a surplus or deficit has to be balanced over a period of three years. Other administrations seem to work on a 12 months basis.

It should be noted that in some administrations (e.g. France, Malta) there is no link between the money received from licensees which goes directly to the State and the budget of the SMO. Therefore there can be no deficit or surplus from fees and charges for the SMO.

In Denmark there is no link between the money received from fees, which goes directly to the State, and the budget of the SMO. This means that there can be no deficit or surplus from fees for the SMO. However, Denmark also collects charges. The charges are collected by the SMO and used by the SMO to cover its costs on the work being done in certain areas. A surplus or deficit should not occur with the charges. If a surplus occurs, charges are decreased for the next period. A deficit has to be recovered by increasing charges for the next period, although this measure cannot currently be applied as the government imposed a stop on the increase of fees/charges and taxes.

3 INFLUENCE OF THE EU PACKAGE ON FEES AND CHARGES

3.1 Administrative charges

About a third of the respondents foresee changes for administrative charges in relation to the implementation of the EU package.

In particular the following changes were mentioned:

- Move from a state budget funding scenario to financing via fees and charges relating to the granting of rights of use of radio spectrum
- Revision of administrative charges so that they cover frequency management costs when there is currently no direct link between the two
- Increase in charges for small users
- Stricter elaboration and execution of the budget to take account of the expected evolution of the market and the dimension of the companies when cost recovery and market evolution are used in preparing the budget.
- Refine current allocation of administrative costs to improve the system and allocate the administrative costs to all frequency users more equitably.

Other respondents do not see any need for changes as their charges are already set up in compliance with the new EU regulations.

However, changes are anticipated at another level because of the increased use of licence exemption. Although certain tasks will continue to be performed by regulators (e.g. international coordination) no money will be received from radio frequency users. Solutions need to be found to ensure the financing of the radio administration as charges can only cover administrative costs incurred by a licensee.

3.2 Spectrum fees

For a large number of CEPT administrations, spectrum fees are already being applied, sometimes parallel to the charges that already cover the costs of the SMO.

One administration (Sweden) does not foresee the introduction of spectrum fees in the immediate future. However a project currently investigates how efficient use of spectrum can be improved or what can be undertaken to achieve the goals of an efficient use of spectrum, spectrum fees being addressed in that context.

Two administrations have plans to do introduce spectrum fees: one administration (the Czech Republic) already introduced spectrum fees in 2000, the planned changes consisting in introducing fees as a means to finance spectrum management. The other administration (Turkey) is currently applying authorisation fees, certificate and usage fees and is planning to collect spectrum fees in the future.

Responses to the questionnaire provided indications as to the criteria or principles upon which spectrum fees are based.

Examples of goals pursued in some administrations through spectrum fees policies include:

- equal treatment of operators
- proportionality
- encouraging of competition
- ensuring optimum use of the radio frequency spectrum
- satisfying the needs of society of high quality telecommunication services
- transparency
- legal certainty.

The following technical and economic criteria are used to define and differentiate spectrum fees:

- Type of operator (public/private)
- Frequency band or sub-band
- Shared use or exclusive use
- Amount of spectrum (bandwidth) used

- Coverage area
- Network parameter
- “Starting” parameter (parameter value increases over time)
- Type of radio service and purpose of spectrum use
- Technical parameter such as EIRP, power
- Operating mode
- Percentage of the turnover/profit of an undertaking
- Level of frequency re-use.

One administration reported having introduced spectrum fee step by step, i.e. service after service.

4 OTHER DEVELOPMENTS

Spectrum fees vs. auction prices

Auctions have been used across CEPT countries for UMTS as they seemed to be the fairest and most transparent method of assigning spectrum with a view to ensuring its efficient use. As opposed to other methods used to assign spectrum and determine spectrum value, in the case of auctions it is market forces only that lead to the determination of a spectrum price. However, after the UMTS experience led to mixed results, this assignment instrument is used with greater caution and in fact subsequent auctions for different applications have not always led to satisfactory results. The benefit of auctions as a means to determine a spectrum price that will ensure the most efficient use of the spectrum can be questioned. Spectrum fees may therefore appeal to administrations as an alternative to ensure spectrum efficiency.

Outsourcing

Outsourcing licensing activities is an option that has been chosen in the United Kingdom in particular, for certain type of applications (programme making and special events). Outsourcing can help reduce the administrative workload of the SMO and free resources for policy work or other spectrum management activities. Outsourcing also means that the SMO loses its direct relationship to licensees. Charges are collected from licensees by the outsourcing company which in turn pays a fee to the SMO. With outsourcing the option of imposing spectrum fees is not given to the SMO, and it may be more difficult for the SMO to maintain control over the fees/charges level.

Licence exemption

As already mentioned in section 3.1, the use of licence exemption is likely to become more widespread in CEPT countries as a consequence of the new EU regulatory framework.

Some administrations are concerned about losing revenue when continuing activities for frequency bands where no licence fees and charges can be collected.

Other administrations do not foresee any specific problems as they consider that non-licensed use means no licensing work and hence no costs for the administration. Some further administrations cover such costs through a spectrum fee that is collected for pursuing spectrum management goals, while others use incentive pricing where there is no direct relation between costs and income. The last two approaches are a way to solve the problem.

Technological developments

With the convergence of radio, telecom and broadcasting in particular, the frontiers are getting increasingly blurred between services or applications which call for technologically neutral approaches to licensing and spectrum management, as laid down in the new EU directives. Convergence has made it increasingly difficult for administrations to licence and hence charge for new systems, as has been the case with the introduction of VOIP for instance. However, the principles of technological neutrality and the fact that individual licensing should now be the exception and general authorisation the rule, should help resolve these problems.

5 CONCLUSIONS

- There seems to be a variety of ways to finance the radio administration. However, all funding scenarios are a variation of one of the five main models that have been identified.
- With legal developments and the implementation of the EU package there may be a shift from some models to others which provide greater transparency and fairness. It can be expected that cost allocation systems will be used more widely across CEPT/EU administrations in order to achieve the above goals.
- The lack of cost-allocation systems makes it difficult to account for the charges for individual licensees or groups of licensees. However, even if there is no link between cost accounting system and charges, overall charges may still be cost based.
- A fee-based financing model enables the SMO to both cover its costs and achieve spectrum management objectives. An SMO may alternatively be financed through a charge-based model and in addition apply fees for certain applications. A number of countries are currently moving towards such models that do not only take into account cost-recovery principles, but also the value of the spectrum.

ANNEX 1 : OVERVIEW OF THE FINANCING OF THE RADIO ADMINISTRATION IN SOME CEPT ADMINISTRATIONS

Note: Although the terms “fees” and “charges” have not been used systematically by administrations in accordance with the definition of “administrative charges” and “spectrum fees”, the context generally makes it possible to identify the intended meaning of the term used.

Bulgaria

The income of the Bulgarian radio administration comes from fees exclusively.

Bulgaria does not use any cost accounting system. The spectrum price and the charge for control over the telecommunications activities are determined in compliance with international benchmark according to the economic status of the country.

The surplus is sent to the state budget, or to the budget of the ICT Development Agency. The whole activity of the Communications Regulation Commission will be cost based from 01/01/2004.

The Communications Regulation Commission will set its administrative charges according to the new EU package from 01/01/2007. Bulgaria does not foresee any substantial change in relation to the implementation of the new package.

Further the Bulgarian Administration sets spectrum fees in conformity with the following principles:

- equal treatment of operators;
- proportionality with regards to the administrative costs;
- encouraging competition;
- ensuring optimum use of the radio frequency spectrum;
- satisfying the needs of society of high quality telecommunication services.

It seems that fees are accepted by industry and are apparently considered reasonable. They were initially set on the basis of a benchmarking, and capped with elements inherent to national peculiarities. Bulgaria took Portugal’s pricing at the time as a basis for developing its own and corrected it downwards in order to facilitate market entry and the development of telecommunications. Fees were further decreased in 2001 for some services like microwave transmission and broadcasting.

Croatia

88% of the radio administration income is from fees and charges and 12% (0.2% of gross annual income of all telecom concessionaries, cable TV operators, internet providers, except concessionaries of radio and TV) from other resources.

The main principles of the system used by Croatia to allocate the different cost of spectrum management are:

- ERP
- H_{eff}
- bandwidth
- analogue or digital
- beam width (in case of satellite com.)
- exclusivity of frequency
- cost of monitoring and coordination.

In Croatia the cost accounting system is used to set fees as follows:

Examples:

- There is a fixed frequency fee for a base station. If ERP of that station is between 5 and 10 W fee is to be increased by 50%. If H_{eff} of that station is more than 600 m fee is to be increased by 100%
- There is a different fixed fee depending of area where frequency is used
- In case of satellite communications the fee is to be increased by 50% if the beam width is larger than 1 degree.

In case of surplus all income left is to be used to enhance the work of the Institute of Telecommunications. It should be noted that this will be changed by the new Law on Telecommunications that is just being passed.

Cyprus

The Republic of Cyprus receives all its income from the state budget and all the fees collected go to the Treasury Department of the Republic.

Radiocommunications service fees were introduced for all the services on 31 January 2003 for the first time and on 1st May 2004 the new EU package (Framework Directive, Authorisation Directive and the Radio Spectrum Decision) was adopted. The Department of Electronic Communications must develop a cost accounting system where fees have to be adjusted yearly and be objectively justified, transparent, non-discriminatory and proportionate in relation to their intended purpose.

Czech Republic

The Czech Republic radio administration receives all its income from the state budget.

The level of operating costs and investment is set by the Ministry of Finance. Administrative and spectrum fees coming from spectrum management activities are given back to the state budget. Spectrum management fees are not dependent on any cost accounting system. All spectrum management revenue is passed to the state budget.

A new Act on electronic communications is under preparation and the whole package of relevant EU documents is taken into consideration. It is assumed that part of the finances for spectrum management functions will flow from fees and charges related to the granting of rights of use of radio spectrum and equipment.

The Czech Republic plans to introduce spectrum fees as a means to finance spectrum management, but at present proposals are under consideration and main principles have not yet been agreed. Spectrum fees have already been introduced by Government order 181/2000 Coll. of 26 June 2000 on Imposing the Amount of Charges for Assigned Frequencies and for Allocated Numbers.

Denmark

In Denmark a fee and a charge are collected. The Danish Administration is mostly financed by the state budget. However, some specific tasks in the administration are financed by a charge.

The money flows on fees and charges are as follows:

Fees

The money from the licence holders' payment of the fee goes directly to the state budget with no link between the money received from fees and the budget of the SMO.

This means that the fees are not set in order to cover the costs of the SMO.

The frequency fee calculation model in Denmark is based on the following:

- The fee level is proportional to the bandwidth used
- The fee level for frequencies above 3 GHz is 1/10 of the fee for frequencies below 3 GHz
- The fee level depends on the possibility to re-use the frequency
- For nationwide licences the factor of re-use equals 1
- For the use of shared frequencies the fee level equals the fee per 25 kHz channel.

In general fees for use of frequencies are paid per site.

In this manner two kind of fees are collected:

- a usage fee and
- a spectrum fee from holders of licences for using the frequencies assigned.

The usage fee is a fixed fee on the use of frequencies. The spectrum fee depends mainly on the possibility of reusing the same frequency or frequency band in other places in Denmark.

Charges

The money from the payment of charges goes directly to the SMO and is used by the SMO to finance specific areas such as amateur radio examination. This means that specific charges cover the costs of the specific areas for which the charges are collected. Not all areas have a charge, which means that the total of charges do not cover the total costs of the SMO.

The charges are based on a cost-accounting system.

Surplus and deficit

In Denmark there is no link between the money received from fees, which goes directly to the State, and the budget of the SMO. This means that there can be no deficit or surplus from fees for the SMO.

However, Denmark also collects charges. The charges are collected by the SMO and used by the SMO to cover its costs of work being done in certain areas. A surplus or deficit should not occur with the charges. When a surplus occurs, the charges are decreased for the next period. A deficit has to be recovered by increasing charges for the next period, although this measure cannot currently be applied as the government has imposed a stop on increase of fees/charges and taxes.

EU package

The new EU package does not influence the administration of fees and charges, which is already in accordance with the EU package.

Introduction of spectrum fees

Denmark has already introduced spectrum fees. The level of the fees on frequencies is fixed annually in the Finance Act and is published by the National IT and Telecom Agency. The Executive Order on the National Telecom Agency's Fee and Charges in 2003 is available on the National IT and Telecom Agency's (IT- og Telestyrelsens) homepage: (<http://www.itst.dk/wimpdoc.asp?page=tema&objno=120676062>)

Estonia

Estonia receives its total income from the state budget. The licence fees are introduced in Estonia.

In this manner three kind of fees are collected:

- fees for issuing of licence for the installation of radio transmission equipment
- fees for issuing of licence for the use of radio transmission equipment
- fees for extension of licence

Some additional charges for inspection of stations are also intended.

The main principles for allocation of rates are as follows:

1. The level of fees depends on the amount of spectrum (bandwidth) used, the coverage area and the frequency sub-band. Different fee levels are determined as a means of optimising spectrum use; e.g. for land mobile services using 12.5 kHz channel spacing the fee is 50% lower than with a 25 kHz channel spacing.
2. Different levels of fees are used to encourage spectrum users to voluntarily vacate a frequency band and migrate to another band. For example, the price of using a channel in the heavily used 170 MHz band is higher than the price of a channel in the thinly populated 400 MHz band.
3. Fees related to the granting of rights of use of radio spectrum and/or equipment for public service providers, public network operators, etc are higher than for users of self-provided networks.
4. Fees for joint use of the radio frequency channel (number of users of the same channel) are lower than for exclusive use.
5. For licence-exempt bands no any fees are required.

The State Fees Act lays down the fees and amendment proposals to the Act can be made once a year. In case of surplus or deficit, an amendment proposal to the State Fees Act for reducing or increasing fees is being made.

Estonia does not see any contradiction between the EU package and the current national situation.

It should be noted, that the relevant legislation will be changed by the new Law on Electronic Communications, which is under preparation.

Finland

In Finland, 95% of the budget (in 2003) is funded by fees and charges, 2% by other government departments, the remaining 3% coming from other fees such as inspection fees, examination fees, amateur and radio maritime certificates.

The Administration does not allocate any particular cost to any particular user. The total amount of the costs of radio administration is calculated and divided among the users. 55% of the total costs are covered by frequency fees and 40 % by licence fees.

When there is an increase in the budget, the increase is shared between users (small increase in each of the fees).

Licence fee amounts have a long historical background. They were first calculated in 1979. Since then

- Some licence fees have disappeared (as the equipment type has been exempted from licensing)
- Consequently the licence fees of remaining licences had to be raised
- Licence fees have also increased because the overall costs of radio administration have increased.
- Some licence fees have been converted into a frequency fee.

FICORA expects to convert all licence fees to frequency fees within a few years.

In Finland, the regulator is not supposed to make any surplus or deficit, but this cannot always be completely avoided. Previously the surplus could be kept in the regulator's own budget and carried over to the next year. However, from 2003 onwards any surplus will be transferred to the state funds. This causes an increased need for accuracy and financial surveillance. There is a constant follow-up of the budget. If a deficit or surplus is expected, an additional budget must be prepared some months before the end of the year with a corresponding increase or decrease in fees.

Finland does not see any conflict between the EU legislative package and their administrative charges.

Spectrum fees currently cover 55 % of the regulator's income. Licence fees cover 40 %. The difference between spectrum fee and licence fee is that licence fee relates to the amount of transmitters and spectrum fee relates to the amount of spectrum.

The regulator intends to extend the usage of spectrum fee to all transmitters within a few years.

Currently the spectrum fee is calculated as follows:

$$K1 * K2 * K3 * K4 * (\text{frequency band in kHz} / 25 \text{ kHz}).$$

whereby:

- K1 = the band factor (e.g. 0-470 MHz K1 = 1 and 470-960 MHz K1 = 0,8 etc)
- K2 = coverage area (for whole Finland K2 = 1; for limited area calculated proportion of 1)
- K3 = starting factor (first year begins from 0.1, then increases gradually to 1 on the 6th year)
- K4 = network factor, which takes into account different parameters and usage of the system. E.g. for the national emergency TETRA system K4 = 1 and for meteorological radiosonde system K4 = 0.1).

All factors are not used for the calculation of all systems, e.g. K4 is not used at all for the calculation of GSM fees.

Complete explanation can be found on pages <http://www.finlex.fi/linkit/sd/20021126> (Finnish version) and <http://www.finlex.fi/linkit/fs/20021126> (Swedish version).

France

Three entities deal with various aspects of spectrum in France.

- The "Agence nationale des fréquences", in charge of the whole spectrum has a budget 100% financed by the General budget (38 million euros in 2002).
- The "Autorité de régulation des télécommunications", independent authorities in charge of telecommunication affairs, has a budget 100% financed by the General budget
- The "Conseil supérieur de l'audiovisuel", independent authority in charge of broadcasting affairs, has a budget 100% financed by the general budget.

All fees and charges are paid directly to the general budget.

France does not have any particular system to allocate the different costs of spectrum management. There are no links between "charges and fees". Apart from that, it can be mentioned that an accounting system is used by the "Agence nationale des fréquences" to inform the Ministry of Finance how is used the budget.

The ANFR does not use any accounting system to set fees.

However, the "Agence nationale des fréquences" has an accounting system upon which it defines its budget. Here are some elements of this accounting system :

	year 2002
PLANNING and INTERNATIONAL AFFAIRS activities	4,94 M€
MANAGEMENT activities	4,90 M€
MONITORING activities	14,68 M€
Work for another entity and define by conventions	12,01 M€
OTHER activities	1,23 M€
TOTAL	37,76 M€

It should also be noted that some employees working at the "Agence nationale des fréquences" are paid by the Ministry of Defence. The corresponding budget is not included in the above tables. In 2002, this was the case for 23 employees.

Surplus or deficits are irrelevant in the French organisation as there are no links between "charges and fees" and the budgets of entities dealing with frequencies.

France is of the view that the new EU package will influence the way they set administrative charges. Administrative charges already reflect some administrative cost in relation to radio frequency activities, but there are plans to improve this system with the aim of sharing the administrative costs between all frequency users.

At present, spectrum fees amounts are defined per service (ITU definition). Prices mostly come from calculation formulas in which technical and economic variables are used.

The way spectrum fees are set is directly linked to the spectrum: bandwidth, centre frequency, shared use... The fee amount is fixed with a view to not disrupting the economic development.

In France, the "Agence nationale des fréquences" is in charge of the whole spectrum.

In addition, at a secondary level, spectrum is managed by 9 "entities":

- Entities using frequencies for their own usage i.e. 7 governmental bodies
- Entities which assign licences i.e. 2 independent authorities:
- "Conseil supérieur de de l'audiovisuel" (CSA) in charge of broadcasting affairs and "Autorité de régulation des télécommunications" (ART) in charge of telecommunication affairs.

Here are some accounting elements for the **9 entities dealing with radio frequencies** for the year 2002:

Repartition per activities	* 2002
Spectrum planning	3,0 M€
National management	3,7 M€
Assignment to end users	2,8 M€
Network monitoring and management	12,6 M€
TOTAL	22,1 M€

Repartition per nature	* 2002
Running	13,0 M€
Human resources	8,0 M€
Depreciation	1,1 M€
TOTAL	22,1 M€

The above figures are drawn from the Report "Economie du spectre des fréquences radioélectriques" written by the "Conseil général des technologies de l'information" in January 2000. Taking into account developments over the four previous years, figures for the year 2002 were calculated with a 2% annual increase.

Hungary

In Hungary the Administration is financed exclusively by the fees and charges it collects. Three government bodies dealing with frequency management (Governmental Frequency Management Agency, Ministry of Defence and Ministry of Informatics and Communications) receive their income from the state budget.

The income from frequency fees cover frequency management activities and other services provided by the Communications Authority of Hungary in the field of radiocommunications. However, no cost accounting system is used for different radio services.

When Hungary developed its frequency fee system it specified activities and equipment used in frequency management and in its supporting area and calculated the corresponding total cost. This was the base of the minimum revenues, which could cover the work of frequency management. In a second step a cost ratio was defined to distinguish between radio services, based on consideration of the number of licensed radio stations.

Differences between income and costs are handled by the state budget. A surplus from fees or auctions of frequencies is transferred to the budget, particularly to the part of the budget that is aimed at funding the refarming of frequency spectrum.

To some extent in Hungary the EU package will have an influence on fees and charges. The administrative fee has to cover frequency management costs, which is not the case today. Currently the government defines the costs of the Authority as a whole, including frequency management, and any surplus is sent to the state budget.

According to the Act on Communications different fees shall be charged for frequency reservation and for frequency usage. The rules on frequency fees were created on the principles of Administrative and Incentive Pricing. They reflect the value of the frequency band used as well as the amount of spectrum used. The frequency usage fee depends mostly on the type of radio service, the frequency band, the occupied bandwidth, the coverage area and whether shared or exclusive frequencies are assigned.

The fee calculation scheme is regulated by ministerial Decree and is being published, providing transparency for all users. The Decree contains:

- a) a fee amount per frequency unit (1 kHz) in detailed tables for some radio services. The frequency fee is proportional to the bandwidth used:
 - for mobile and broadcasting services the unit is dependent on the frequency band, transmitter power and height of antenna,
 - for satellite earth stations and for radio relay stations in the fixed service the bandwidth unit price has some different values depending on the frequency band. The highest unit price is for lower frequencies, while the lowest price for higher frequencies,
- b) a fixed fee amount per station for radio navigation and radio location services as well as airborne equipment in the aeronautical mobile service,
- c) applications partially or completely exempted from payment.

Ireland

In Ireland the radio administration is financed exclusively by the fees and charges it collects.

The main principle of the system to allocate different costs of spectrum management is that the regulator's accounting system records the costs (e.g. salary, travel, training) against different activities. Other costs e.g. rent, insurance, depreciation are recorded centrally and are not initially allocated to different activities. These costs would then be allocated to activities based on the number of staff involved in those activities.

The accounting system provides detail on the different costs of spectrum management. However, other factors must be taken into consideration when setting fees, e.g. congestion pricing, pricing to ensure spectrum efficiency, the economic value of the spectrum.

The ComReg is required by legislation to pay any surplus to the state.

Ireland does not see any significant change in the way they set their administrative charge. Prior to the introduction of the new EU regime, the costs of regulation were recovered by a levy on turnover. The benefits of the levy system were acknowledged in the text of the EU Authorisation Directive (Recital 31) which states that 'An example of a fair, simple and transparent alternative for these charge attribution criteria could be a turnover related distribution key'. ComReg now has in place a turnover related administrative charge which it operates in a similar way to the levy on turnover which operated prior to the introduction of the new EU regime.

Spectrum fees have been in place for a number of years. These are also known as Wireless Telegraphy (WT) licence fees, which are recurring annual fees relating to the use of particular spectrum bands or specific WT apparatus.

When setting fees ComReg would consider the costs of granting the right of use and the economic value of the spectrum. Other factors to be taken into consideration would be issues such as congestion pricing and the need to ensure that any pricing mechanism reflects the efficient use of that spectrum.

Latvia

The radio administration in Latvia is financed exclusively by the fees and charges it collects.

The Latvian Telecommunication State Inspection (LTSI) has a cost accounting system according to the Latvia law "About accountancy". For each year the LTSI works out an income and expenditure budget that is approved by a shareholders' general (assembly) meeting.

The LTSI use a cost accounting system based on the costs of the following:

1. Salaries
2. Social tax
3. Administration expenses
4. Work and services purchased
5. Information technology
6. Capital investments.

In the case of a surplus, part of the money goes to a fund of reserve according to the law of "Non-profit government stock company" (BO VAS).

The rest of the money is foreseen for investment in capital assets to develop the management of radio spectrum.

Latvia does not see the new EU package influencing the way they set their administrative charges.

The value of the spectrum fee depends on the type of radiocommunication service and the purpose of spectrum use (e.g., satellite, fixed, mobile, maritime, broadcasting, amateur or aeronautic service).

The spectrum fees depend on:

1. Frequency band and frequency channel bandwidth;
2. Power of radio transmitter;
3. Effective radiated power of radio transmitter;
4. Carrying capacity of aircraft;
5. Area of usage of transmitter (city, rural area).

The regulator formulates clear and understandable regulations for the use of radio frequency spectrum for entrepreneurial activity (commercial activity) in the telecommunications sector, examines all applications for the use of radio frequencies of the entrepreneurial activity (commercial activity) in the telecommunications sector, issues radio frequency usage permits in due time, and includes permission to use radio frequencies in individual licences.

The activities of the regulator shall be financed in accordance with the Law on Regulators of the Public Services and the above Law.

The regulator is entitled additionally to collect payments regarding:

- issuing and supervision of individual licences;
- registration and supervision of general permits;
- administration of numbering and addresses; and
- other services provided by the Regulator.

Payments by telecommunications undertakings to the Regulator in a year may not exceed 0.2% of the telecommunications undertaking's net turnover in the previous financial year, in the conduct of the activities specified in the individual licence or general permit.

Additional information about regulation:

1. Law on Telecommunications (01.11.2001.);
2. Law on Regulators of Public Services (07.11.2000.);
3. Radio and Television Law (08.09.1995.)

Lithuania

In Lithuania, 69% of the budget comes from fees and charges, 29% from other sources and 2% from other government departments.

Fees are based on the following parameters: coverage, population, number of channels, bandwidth, radiated power, number of transmitters.

Here is an example of fee calculation for a common digital cellular radio communications network in Lithuania:

$$MT = M1 + M2 + \dots + Mn$$

$$Mi = E * Si, \quad i = 1, 2, \dots, n$$

whereby *MT* - yearly fee for surveillance of used radio frequencies
Mi - yearly fee for surveillance of used radio frequencies for station "i"
Si - number of radio frequencies (channels) of station "i"
E - yearly fee for surveillance of used frequency of common digital cellular radio communications network transmitter
n - number of base stations]

According to the Law on Budget Formation a surplus has to be forwarded to the state budget.

As regards the influence of the EU package on fees in Lithuania it is expected that taxes for small users will increase.

The following principles apply to fees and charges:

- Transparency
- Proportionality
- Legal certainty
- Legal expectation
- Non-discrimination
- Legal acts have no retroaction

Malta

The Administrations in Malta receives its total income from the state budget.

Malta does not have any cost accounting system.

Fees are set by comparison with other European Administrations while bearing in mind the local economic situation.

All income from fees and licences is passed on to the central government.

Malta foresees an influence from the EU package, as at present administrative charges and licence fees do not necessarily bear any relation to administrative costs. In the future Malta will be adopting the measures set out in the new EU package.

Spectrum fees are currently levied based on:

- a) bandwidth used
- b) frequency band (fees are lower for higher frequencies in order to avoid the congested lower bands)
- c) discount for frequency re-use.

The Netherlands

The Administration in the Netherlands is financed exclusively by the fees and charges it collects.

The main tasks of the Radiocommunications Agency (RA) Netherlands are:

- *Frequency management* i.e. activities aiming at the creation, planning and issuing of frequencies.
- *Standardisation of telecommunications equipment* whose aim is the efficient use of spectrum and interference free usage.
- *Enforcement of the frequency usage arrangements* i.e. activities which contribute to ensuring compliance with the rules with regard to the use of airwaves and equipment.

RA Netherlands implements the part of the policy which is related to the structuring of the radio spectrum. The distinction between policy and its implementation leads to productive efficiency.

General fee policy

RA Netherlands covers its costs operationally, with the commitment to 100% cost-efficiency **per product group**. RA Netherlands adopts the principle 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. RA Netherlands distinguishes the following product groups:

- **Categories relating to the use of frequency space** (Fixed links, mobile communication, mobile public telephony and public paging, radio determination, amateur radio operators, broadcasting)
- **Categories of terminal equipment and radio transmitters and other equipment** (examinations, issue of type approval and inspection certificates and certifications, terminal equipment).

In general the tariff has two components:

- **One-off licence fee** which reflects the **costs** that occur once in connection with issuing the licence (e.g for frequency planning and management, international co-ordination, administrative costs and investment in equipment); the indirect costs of staff departments such as the communications department and legal department are also 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.
- **Annual costs for enforcement:** every year a licence holder pays for enforcement and monitoring efforts. 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 tariffs. Tariffs are published in the 'RA Charges Order'. See appendix A 'RA Charges Order 2003' (Dutch version).

Charges are based on the estimated expenses for the efforts of the Agency for the coming year. If for a given product group more income is generated than had been estimated for that product group this surplus is taken into account for the calculation of charges for the following year for that product group.

The cost-accounting system is used to estimate the expenses for the various tasks of the Agency for the coming year per product group. Based on those figures and the estimated amount of licences in use and licences expected for the coming year a charge is set and published in the RA Charges Order for the coming year. In the near future the cost-accounting system will be based on actual time recording information on how much time is spent on what tasks within the RA.

If the **total** income exceeds the total expenses of the Agency, the Agency is allowed to keep this in 'reserve' (within certain limits) and to add it to the net worth of the Agency. However, if the income of a product group exceeds the estimated expenses of that product group this surplus is taken into account in setting the charges for the coming year. The same goes for a deficit.

The EU package does not have an influence on administrative charges. Only the directives regarding licence-free use in certain frequency bands confronts the Agency with a possible financing problem. Despite the licence-free regime the Agency has to perform certain tasks for that use (international work; solving interference problems etc.) for which they receive no money from licence holders. Among solutions that could be considered are e.g. the financing of those activities by the general budget, or alternatives as to charge an amount of money per receiver, possible charged to manufacturers, as a tax for unlicensed terminals. These are only ideas that have to be worked out.

Spectrum fees already exist. The Law permits the assignment of frequencies by means of beauty contest or auction. In case of beauty contest also a separate fee can be included (see below). The possibility to include a bid in a beauty contest was included in the Telecommunications Act on 26 July 2001.

Further the law permits to charge a fee for the use of frequencies to enhance efficient use of the frequencies in accordance with European Directive 97/13EC. The fee can be a one-off fee or a yearly fee corresponding to the duration of the licence. The fee is set by the minister of Economic Affairs in accordance with the minister of Finance and in case of commercial broadcasting in accordance with the minister of Culture Science and Education. In the latter case the fee can reflect the benefits of exploitation of the licence related to a percentage of turnover or to a percentage of the profits that is generated as a result of exploitation of the licence.

In short, only cost based fees (or charges) apply in the Netherlands, except for extra market based fees described above.

Poland

Ministry: in Poland the Ministry applies separate fees for technology control, legal services, logistic support etc, but no indication is provided on the use of a specific system to determine those fees.

The Ministry has no special cost accounting system which sets fees or helps to set fees. Principles for setting fees are specified in special enclosures to secondary legislation of fees for the right use of radio frequencies. For instance in civil regulation (in Poland there are different fees for civil operators and for government – globally) there are four enclosures each being assigned to different kinds of radio communication services. Polish regulation sets annual fees which depend on the type of service – e.g. the above enclosure sets a fee for the right of use of one duplex radio canal in local range telecommunication network considering the type of network, width of radio channel etc. Accountants in the Department of Finance and Budget (at the NRA) calculate annual fees (by hand) based on appropriate data from individual licences which is delivered from the relevant department.

Regulator

As far as the Office of Telecommunications is concerned, costs connected with spectrum management are covered by the Office of Telecommunications and Post Regulation within its annual budget. The regulator receives funding from the state budget. The amount of this funding is set each year in the Annual Budget – the act indicating finance of the government set by the Parliament after the draft issued by the Minister of Finance.

For the regulator the fee amounts are set by the Minister of Infrastructure in the form of the secondary legislation. The Minister of Infrastructure receives an annual report of the President of the Office of Telecommunications and Post Regulation, which includes information on financial issues of the regulator.

According to the Telecommunications Law, the authorization fee cannot exceed the cost connected with the issuance of such an authorization.

In Poland the Telecommunication law, which came into the force on 1 January 2001 year, sets fees for the right of use of radio frequencies. There are two kinds of fees:

- Annual fee for the use of radio frequencies,
- One-off frequency allocation fee.

There are two pieces of secondary regulation regulating these fees:

- The Regulation of Minister of Infrastructure relating to fees for frequency allocation and for use of frequencies.
- The Regulation of Minister of Infrastructure relating to fees for the use of frequencies for government institutions.

The present amendment of the Telecommunication law sets two kinds of fees:

- Annual fee for use of radio frequencies for entities which do not have allocation (frequency).
- Annual fee for entities which have their own frequency.

In practice, the Minister in his decision considers the administration costs which incur in the regulator's organisation as well as the income of the operators.

Portugal

Formally, the regulator ANACOM does not have a cost accounting system. Fees and charges defined represent an approximated value of the cost of the necessary working hours, as well as the corresponding functioning costs (indirect costs).

ICP-ANACOM has never been in a deficit situation. Initially, when it was formed, the tariff system was based on the principle that revenues had covered all functioning costs.

Annual tariffs were set by dispatch of the member of Government responsible for the communications sector, in function of the costs associated with administrative, technical and operational tasks, and their corresponding inspection.

With the liberalization and the growth of the use of the spectrum ICP-ANACOM has always had a surplus, which was accounted as special reserves, in accordance with the Official Accounting System. In the last two years, the ICP-ANACOM transferred to the State Budget a significant amount of these reserves, according Order of The Minister of Finances.

For Portugal the implementation of the EU package in relation to fees and charges compels to more severity in the elaboration and execution of the budget, because it needs to take account of the expected evolution of the market and the dimension of the companies. Recently the situation of economic crisis and the adjournment of commercial offer of certain communications services, as in the case of digital television and UMTS, have had an impact on the level of foreseen income. In general, ICP-ANACOM has been applying a criterion that combines coverage of its costs and market evolution.

ICP – ANACOM has introduced the spectrum fees concept. Accordingly, the spectrum fees concept has been introduced selectively (step-by-step). In line with this proposal, Land Mobile Service (private networks) was the first radio service covered by the spectrum fees concept.

In the near future, ICP-ANACOM intends to enlarge the spectrum fees concept to all radio services, namely:

- Other mobiles services (private networks)
- Fixed services:
 - Point-to-point links
 - Point-to-multipoint links
- Satellite services (earth stations)
- Broadcasting services (analogue and digital systems)
- Public mobile communications (GSM, UMTS)

Spectrum fees concept - main principles used by ICP- ANACOM:

- Main pricing factors:
 - a) bandwidth (standard channel width for a particular usage)
 - b) coverage area (geographical occupancy)
 - c) number of channels used
 - d) operating mode (simplex, semi-duplex, duplex)
- Others pricing factors:
 - e) exclusivity or sharing (exclusive occupancy or sharing of a given channel with others users)
 - f) network operator (public operator or private operator)
 - g) frequency band (congestion of frequency bands)
 - h) radio networks/system (economic potential associated with the business developed by the costumer)
 - i) location (demand for spectrum varies across the country).

(Example attached in **Annex 2-B**).

Romania

The Romanian Administration is financed exclusively by the fees and charges it collects.

Romanian spectrum fees observe the following principles:

- Optimal use of radio frequencies;
- Transparency;
- Non discrimination;
- Proportionality with the purpose they were meant for.

The fees for spectrum usage are designed for the implementation of the legislation and regulations in force and also for the assumed IT & Communications policies and strategies' application with regard to the spectrum management. The General Inspectorate for Communications and Information Technology as part of the MCIT, assigned to collect those fees, is using them for following types of activities:

- Refarming of radio frequencies usage for non governmental users aiming at the harmonisation with the ECA;
- technical support in case of dispute for non governmental radio frequencies bands;
- technical support for maintaining the National Table for Allocation of the Frequencies Bands;
- resolving technical problems in order to prevent and to eliminate harmful interferences;
- checking compliance with the licence provisions;
- enforcement measures in order to reduce the illegal use of the radio frequencies;
- technical support for coordination of the spectrum with other national and international bodies with spectrum management responsibilities;
- support for the activities of integration and harmonisation with specific European legislation.

The fees are set by :

Tariff for a network with one frequency in a simplex mode

EUR

		0	1	2	3	4	5	6	7	8
H ef (m) \ ERP (W)		≤ 10	≤ 20	≤ 40	≤ 80	≤ 160	≤ 320	≤ 640	≤ 1280	> 1280
0	≤ 2	22	33	49	73	110	165	247	371	556
1	≤ 4	28	42	64	95	143	214	322	482	723
2	≤ 8	37	55	83	124	186	279	418	627	940
3	≤ 16	48	72	107	161	241	362	543	815	1223
4	≤ 32	62	93	140	209	314	471	706	1060	1590
5	≤ 64	81	121	181	272	408	612	918	1378	2066
6	□ 64	105	157	236	354	531	796	1194	1791	2686

Tariff for local network of TV point to point or point-multiple point distribution

ERP (W)	□ 1W	□ 2W	□ 4W	□ 8W	≤ 16W	≤ 32W	≤ 64W	≤ 128W	≤ 256W	□ □ 56W
Tariff (EUR)	28	36	48	60	80	120	160	220	260	400

The surplus goes to next year's budget of GICIT.

Necessary adjustments are planned in order to harmonise with the new EU package.

Sweden

The Swedish Administration is financed exclusively by the fees and charges it collects.

In Sweden each area of activity of the Regulatory Authority (PTS) should cover its costs over a period of one to five years. The fees of a particular area of activity should cover its direct costs and a share of the indirect costs.

A large part of the direct costs are labour costs. The direct labour cost is calculated from the time reports of the PTS employees who report all working hours based on a number of areas of activities and subgroups of activities. There are currently about 15 areas of activities related to radio/spectrum management and subgroups of activities such as supervision, authorisation and strategic projects. The indirect costs are allocated based on the number of people in each department or division. The direct costs and the distributed indirect costs are financed by the contribution margin from the fees/charges of each area. Each fee area gives a contribution margin to finance the indirect costs.

Within the area of activity “Radio” a licence owner should finance a reasonable share of the indirect costs. One area’s share of the total contribution margin should not be more than twice the share of the direct costs.

The fees/charges are calculated based on forecasts of a three-year period. In the yearly budget request to the Government, the costs of each area of activity are related to the forecast growth of licences and notifications during the same period.

Using this financing model PTS has a favourable position maintaining a smooth development of fees.

The fees/charges are set so the income covers the cost price within each area of activity. Within the area of activity “Radio” the fees are set in such a way that the costs are distributed with a reasonable share over different categories of licence holders.

As a result of the new EU package and the Swedish Government Electronic Communication Act, PTS has initiated a review process of the current fees for the area of activity “Radio”. Since the review process has only just begun it is too early to comment on its results. PTS refrains from giving examples from the current Radio fees since they will not necessarily give representative information of the fees to come.

PTS’s long- term financial goal is to balance any surplus or deficit. If a surplus or deficit occurs it will be balanced over a period of three to five years.

For Sweden, the package does not influence fees and charges i.e. PTS will not alter the criteria used for setting administrative fees. However, PTS have been calculating with taking into account the expected losses in revenue for licence-exemptions caused by the authorisation directive. In relation to section 2-6, PTS are also looking into the possibilities for introducing fees for numbers and frequencies in the future.

Sweden does not currently foresee the introduction of spectrum fees in the near future. However, a large project has been undertaken, with the aim of looking into how spectrum, in the Swedish case, can be more effectively used/or more precisely what needs to be done to achieve the goal of an effective use of spectrum. The issue of spectrum fees are a part of this work, and the issue may be taken into consideration when the new law will come under revision in two years.

Switzerland

27.5% of Switzerland’s total budget is financed by the State, the further 72.5% resulting from income from fees and charges. This information relates to the global financing of the Administration and not only to the Frequency Management Division. Switzerland should in the future be financed solely by fees and charges.

In Switzerland two general principles, beside the requirement of a legal basis, are applicable to all administrative fees, including those relating to spectrum management:

- **Principle of cost-coverage** (of which the cost-recovery principle is a narrowed-down version): the total of fees collected covers the total costs of the relevant branch of the administration.
- **Principle of equivalence** (or principle of proportionality): for administrative fees distinction has to be made between recurrent and non-recurring fees.
 - *Recurrent fees – also called indirect fees:*

To cover annual fixed costs, e.g. participation in the costs for international activities and contributions. As these costs are caused by and charged to a whole customer group and are not caused by the behaviour of one individual, it is advantageous to fix these costs by means of a flat rate.

- *Non-recurring fees - also called direct fees* (e.g. distribution and handling fees): These fees are caused by and allocated to an individual customer. The amount is defined by the time consumed to carry out a certain work in relation with a certain hourly rate. (In cases of “bulk businesses” with homogeneous processes a flat fee is used to simplify.)

The results of the cost accounting system (former and current years) are used as a basis in the process of defining fees for the following years (changes are necessary in terms of ensuring cost-recovery per product). The system is also used to register hours which are initiated by customer requests, the occurring costs will be covered by a fee on the basis of an hourly rate.

Example: Amateur radio license

The non-recurring administrative fee for the issue of a license is SFr. 50.--. The fee for modification of the license amounts to SFr. 25.—.

The monthly administrative fee amounts to SFr. 8— (Recurrent fee).

OFCOM levies a unique flat fee for temporary amateur radio licenses, valid up to 3 months.

A surplus is forbidden in accordance with the two principles mentioned above: the first limitation is determined by the main principle of cost coverage, whereby every amount which exceeds the costs is considered an illegal gain. It may even be considered illegal to cover the cost when the principle of equivalence is violated. In case of a surplus the (administrative) fee has to be reduced.

OFCOM tries to estimate, during the budget process, the cost coverage level of the whole entity. The financial gap between the effective income and the effective cost are covered by the state budget (see section 2-1). In case of a deficit - costs of a product are not covered by administrative fees – the OFCOM tries to adapt these fees to a cost-recovery level.

The EU package does not have any influence on the way Switzerland sets administrative fees.

Switzerland applies spectrum fees. The main principles are laid down in Art. 39 Telecommunications law as follows:
Art. 39 Licence fees in respect of radiocommunications.

The licensing authority shall charge a fee for radiocommunications licences.

The amount of the fees shall be calculated on the basis of:

- a. the frequency range allocated and the class of frequency;
- b. the bandwidth allocated;
- c. the territorial scope;
- d. the temporal scope.

If the radiocommunications licence is granted to the highest bidder, the licence fee shall correspond to the amount of the bid, minus administrative expenses. The licensing authority may fix a minimum bid.

The details are regulated in the Ordinance of fees in the telecommunication sector .

Example:

Art. 9 Mobile services

For a licensed nation-wide service the license fee is per assigned radio frequency channel with a high frequency bandwidth up to 25 kHz sFr. 1500.-- / year.

For licensed regional service the license fee is per assigned radio frequency channel with a high frequency bandwidth up to 25 kHz sFr. 300.-- / year.

For radio frequency channels with a multiple of the high frequency bandwidth of 25 kHz the license fees are calculated according to paragraph 1 and 2 using the same multiple.

Turkey

The Turkish Administration is financed exclusively by the fees and charges it collects.

Turkey charges the following fees that provide the funding of spectrum management activities:

- Radio equipment certificate fees which are collected once.
- Annual usage fees which are calculated according to each service type.

The following example was provided of how fees are set for PMR:

1. Certificate fee (collected once):
 - a) Base station : 16 €
 - b) Mobile : 10 €
 - c) Repeater : 32 €
 - d) Hand-Held : 3 €
2. Annual frequency usage fee (AFUF):
AFUF=# of device x (# of simplex channel x 3 € + # of simplex relay channel x 4 € + # of duplex channel x 5 € + # of duplex relay channel x 6 €)].

When a surplus occurs, the Regulatory Authority transfers the excess money to the state budget. In case of deficit, the Regulatory Authority requests additional money from the state budget.

The Telecommunications Authority collects 0.35 % of the annual turnover, excluding the taxes of the licensees, as administrative fee. Necessary adjustments are planned in order to harmonise with the new EU package.

Authorisation fees are determined by benchmarking from world experiences and are fully transferred to the Treasury.

At the moment TA is collecting radio equipment certificate and usage fees. But, in the new tariff model which is being planned, spectrum fee will be collected from operators.

United Kingdom

The Administration of the United Kingdom is financed exclusively by the fees and charges it collects. Although there is no direct funding from other government departments, these pay spectrum fees like any civilian user.

The United Kingdom Government's policy is for all spectrum users to face incentives to use the spectrum as efficiently as possible. Spectrum management costs are not a (primary) factor in the UK fees and charge setting although RA retains the power to recover cost based fees. Spectrum pricing in the UK is used to achieve spectrum management objectives, not to maximise licence revenue.

Charges for spectrum are set by two mechanisms:

1. The use of **Auctions** – the fees are set directly by the market
2. **Administrative pricing** – fees are set by regulation on the basis of spectrum management criteria.

The existing method of calculating spectrum prices is based on the “**value of the next best alternative**” using a method set out in a report by Smith-NERA for the Agency written in 1996.

The Wireless Telegraphy Act 1998 enabled the introduction of administrative spectrum pricing by permitting the Secretary of State to set charges that promote the efficient use and management of the radio spectrum, the economic benefits from using radio (including customer innovation) and competition in telecommunications services.

Since the WT Act 1998, administrative incentive pricing has been introduced to a number of spectrum applications. Spectrum assignments identified by N&S where administrative pricing could be usefully applied was limited to the frequency range 30MHz–60GHz, defence, broadcasting, radio astronomy, space, research, meteorology, satellite, fixed links and mobile radio. To date the RA has successfully implemented spectrum pricing in many of these areas prioritising where economic distortions are greatest.

In its response to the Independent Review of Spectrum (October 2002) the Government announced its intention to review the effects of incentive pricing and the model and methodology for valuing spectrum and setting fees. The RA (on behalf of the Secretary of State) is in the process of commissioning an independent study to support this exercise. The study will review our current pricing regime and formulate a set of guiding principles and a theoretical perspective to guide the setting

of administrative prices for radio spectrum in the future. The work will also apply this method in order to make recommendations to set licence prices in broad use categories.

The study will be divided into two parts with the objectives of:

- Phase A: Formulating a set of guiding principles and a theoretical perspective to guide the setting of administrative prices for radio spectrum.
- Phase B: Phase B of the study should apply the method of Phase A in order to make recommendations to set licence prices in broad use categories and to calculate their values in representative cases in each major area of radio application.

RA hopes to complete the study in early 2004.

It is expected that responsibility for spectrum management (including pricing) will transfer from the Secretary of State to the new Office of Communication (Ofcom), before the study is completed. It is expected that Ofcom will have responsibility for setting all fees from 2004, but by exercising the same criteria under the 1998 Act as the Secretary of State does at present. It is expected that the review will be published in full by Ofcom and that any changes to the pricing regime resulting from the study will be subject to extensive consultation.

At the present time all fees are set to achieve spectrum management objectives (incentive pricing). The Wireless Telegraphy Act provides the power to set fees to reflect cost. The Communications Act 2003 allows cost to be recovered at a gross level (i.e. organisation running cost) and for fees to contain an incentive and cost based element.

In the case of surplus fees, the surplus is transferred to the Treasury for the public central bank account, or it goes back into spectrum management.

The United Kingdom administration uses incentive pricing which is permitted by the EU Package, therefore the new EU package will not influence the way that administrative charges are set (see Article 13 of the Authorisation Directive.)

ANNEX 2 : EXAMPLES OF FEE CALCULATIONS

A - NETHERLANDS EXAMPLE COMMERCIAL RADIO FEES:

Commercial broadcasting (analogue)

Frequencies for commercial broadcasting were recently assigned in 2003 via beauty contest. Here also a *separate* amount of money is involved as part of the beauty contest. This amount of money has to be paid *together with and separately from* the cost based fees that also have to be paid (yearly).

Also a once-off amount of money has to be paid *independently and separately from* the bid in the beauty contest 'to ensure optimal use of the spectrum', and is related to the market value of the spectrum for commercial broadcasting. So to summarize a commercial broadcasting licence holder has to pay:

1. a yearly cost based fee ('charges') reflecting the activities for monitoring and interference to be paid to the Radiocommunications Agency
2. a bid in the beauty contest (applicant *can* make a bid, it is not necessary, but increases his chance to win the licence)
3. a once-off fee 'to ensure optimal use of the spectrum' - this reflects in one way or another the market value of the frequencies (for calculation of the fee, see next)

Formula for calculating fee in case of nation-wide licence FM

The chart below reflects the basic fee to be paid *per 1000 listeners* for nation-wide FM broadcasting.

Figures are based on the following assumptions:

- returns on advertisement income per 1000 listeners will increase if coverage is enlarged
- figures are based on historical figures of (net) turnover realized in the advertisement market for commercial radio
- it is assumed that during the license period a yearly increase of 5% is realized of the historical advertisement income
- regarding the licence period a net present value is calculated according a 7% discount rate
- as a result € 7080 of net turnover then is realized on average per 1000 potential listeners.
- The fee is 6.5% of this amount.

Chart 1

From	To	Fee per 1000 listeners
0%	5%	€ 40.-
≥5%	10%	€ 75.-
≥10%	15%	€ 110.-
≥15%	20%	€ 145.-
≥20%	25%	€ 180.-
≥25%	30%	€ 215.-
≥30%	35%	€ 250.-
≥35%	40%	€ 285.-
≥40%	45%	€ 320.-
≥45%	50%	€ 355.-
≥50%	55%	€ 390.-
≥55%	60%	€ 425.-
≥60%	65%	€ 460.-
≥65%	70%	€ 495.-
≥70%	75%	€ 530.-
≥75%	80%	€ 565.-
≥80%	85%	€ 600.-

Fee calculating Formula:

$$S \times B \times Mg = \text{Fee}$$

Whereby:

S = Fee based on the *average* amount of (net) turnover per 1000 listeners taken into account the area covered by the licence (see chart 1 above)

B = Number of potential listeners covered by the licence (coverage) per 1000 potential listeners

Mg = Percentage to be paid of the total (standard) fee in case a certain format is prescribed (e.g classical music or news station).

Calculated examples

1. A certain nation-wide FM licence has a coverage of 67% and is free to broadcast its own format (e.g. pop-music). In chart 1 above we can find that in case 67% coverage is realised, the average value(fee) per 1000 listeners amounts to € 495,-. The real number of potential listeners is 67% of 15.560.000 (total of potential listeners in The Netherlands) and is 10.425.200 listeners. So a fee results in € 5.160.474,- (= 10.425,2 * € 495,-)
2. A certain nation-wide FM licence has a coverage of 49 % and in this case a certain format is prescribed (e.g. classical music). In the chart above we can find that in case 49 % coverage is realised, the average value per 1000 listeners (fee) amounts to € 355,-. The real number of potential listeners is 49% of 15.560.000 (total of potential listeners in The Netherlands) and is 7.624.400 listeners. Normally a fee of 7.624.400* € 355= € 2.706.662 would have to be paid. However, in this case only 20% has to be paid of that amount because of the 'discount' given as a result of the prescribed format. So a fee results of € 541.332,- (= 20% * € 2.706.662).

Fee calculation formula in case of non-nationwide (regional) FM broadcasting**Chart 2**

From	To	Fee per 1000 listeners
0%	5%	€ 40,-
≥5%	10%	€ 75,-
≥10%	15%	€ 110,-
≥15%	20%	€ 145,-
≥20%	25%	€ 180,-
≥25%	30%	€ 215,-
≥30% (=maximum)		€ 250,-

Fee calculation formula :

$$S \times B \times Mg = \text{Fee}$$

Whereby:

S = Fee based on the *average* amount of (net) turnover per 1000 listeners taken into account the area covered by the licence (See chart 2 above)

B = Number of potential listeners covered by the licence (coverage) per 1000 potential listeners

Mg = Percentage to be paid of the total fee in case of non-nationwide (regional) FM broadcasting (50%).

Calculated Examples:

1. A regional license has a coverage of 1.71%. The percentage to be paid of the total fee in case of a regional licence is 50% (Mg). In chart 2 above we can find that in case 1.71% coverage is realized, the fee per 1000 listeners amounts to € 40,-. The real number of potential listeners is 1.71% of 15.560.000 (total of potential listeners in The Netherlands) and is 266.076 listeners. Normally a fee would show a result of 266.076* €40= € 10.643,-. Regarding the discount of 50%, a fee results of € 5.322,- (50% * € 10.643,-)
2. A regional license has a coverage of 30 %. The percentage to be paid of the total fee in case of a regional licence is 50% (Mg). In chart 2 above we can find that in case 30 % coverage is realised, the fee per 1000 listeners amounts to € 250,-. The real number of potential listeners is 30 % of 15.560.000 (total of potential listeners in The Netherlands) and is 4.668.000 listeners. Normally a fee would show a result of 4.668.000* € 250= € 1.167.000,-. Taking into account the discount of 50%, a fee results in € 583.500,- (50% of € 1.167.000,- =).

Fee calculation formula in case of AM broadcasting

$$S \times B \times Kf = \text{Fee}$$

Whereby:

S = Fee based on the *average* amount of (net) turnover per 1000 listeners taken into account the area covered by the license (See [chart 1](#) above)

B = The average 24-hour coverage of the AM license * 15.560.000 potential listeners (total number of potential listeners in the Netherlands)

Kf = discount percentage of standard fee in case of AM radio (95%).

Calculated Example:

Imagine an AM license with a *average* coverage of 36% (different coverage between day and night). In chart 1 above we find that in case 36 % coverage is realised, the average value(fee) per 1000 listeners amounts € 285,-. The real number of potential listeners is 36 % of 15.560.000 (total of potential listeners in The Netherlands) and is 5.601.600 listeners. Normally a fee would show a result of 5.601.600* € 285= € 1.596.456,- Considering the discount of 95 %, a fee would result in € 79.823,-(5% * € 1.596.456,-)

General reasoning:

The fees are related to the population (number of people) that can be covered by that particular licence. The reason is that the market value is higher, when the total population covered is higher. As we are dealing with commercial broadcasting here, the advertisement income is related to the population covered, so also is the fee related to the total population covered.

B - PORTUGAL

Example: Land Mobile Service (private networks)

The following describe the detailed method in relation to Land Mobile Service (private networks)

Land Mobile Service - Exclusive channels

Spectrum fee (radio network) U * P

where:

U is the number of spectrum tariff units;

P is the price of the spectrum tariff unit;

The number of spectrum tariff units (U) is given by the following expression:

$$U = A \times L \times C \times N$$

where:

➤ **A - geographical coverage (area = km²)**

A (km ²)	Coverage
29,599	national
11,310	cellular - cells with 60 km cell radius
2,827	cellular - cells with 30 km cell radius
707	cellular - cells with 15 km cell radius

➤ **C - operating mode (simplex, semi-duplex or duplex)**

C	Operating mode
1	simplex
2	semiduplex; duplex

➤ **N** - number of channels (assigned frequencies).

The Price of the spectrum tariff unit (P) is given by the expression:

$$P = V_B \times F$$

where:

➤ **V_B** is the base value of the spectrum tariff unit

(for the time being $V_B = \text{€ } 0.000334738$)

➤ **F** is the factor which measures the technical, economic and social impacts associated with the business developed by the private or public operator

F is given by the expression:

$$F = W_1 \times W_2 \times W_3 \times W_4 \times W_5$$

where:

➤ **W₁** - coefficient for public or private radio networks

W ₁	Service/network
1	Public network
1.2	Private network

➤ **W₂** - coefficient for congestion of the frequency band, taking into account the location of the network.

W ₂	Degree of congestion
0.95	Non-congested
1	congested
1.2	Heavily congested

➤ **W₃** - coefficient for demand of channels in a specific frequency band (different prices per frequency band, function of the correlation between offer/demand conditions). For the time being $W_3 = 1$.

➤ **W₄** - coefficient for the economic potential associated with the business developed by the costumer.
(For the time being $W_4 = 13.0321$).

➤ **W₅** - coefficient which reflects the social development within different country regions

W ₅	Country regions	
1.81	Class A	Grande Lisboa; Grande Porto
1.54	Class B	Baixo Vouga, Pinhal Litoral; Baixo Mondego; Entre Douro e Vouga; Península de Setúbal; Região do Algarve
1	Class C	Ave; Alentejo Litoral; Oeste; Cávado; Lezíria do Tejo; Médio Tejo.
0.79	Class D	Região dos Açores; Beira Interior Sul; Região da Madeira; Alto Alentejo; Alentejo Central; Minho-Lima; Douro; Pinhal Interior Norte.
0.6	Class E	Cova da Beira; Beira Interior Norte; Dão-Lafões; Pinhal Interior Sul; Baixo Alentejo; Tâmega; Alto Trás-os-Montes; Serra da Estrela.

(*) Channels - national coverage, $W_5 = 1$

Land Mobile Service - shared channels

Channels - national coverage (U*P = channel spectrum fee)

The spectrum fee applicable to each of the networks that share a national channel depends on the corresponding number of mobile stations (ML) according to the following scale:

Number of mobile stations (ML) per network	Spectrum fee
$ML < 5$	$1/30 * (U*P)$
$6 < ML \leq 10$	$1/15 * (U*P)$
$11 < ML \leq 20$	$1/10 * (U*P)$
$21 < ML \leq 35$	$1/5 * (U*P)$
$ML > 35$	$1/2 * (U*P)$

Cellular channels (U*P = cellular channel spectrum fee)

The spectrum fee applicable to each of the networks that share a cellular channel depends on the corresponding number of mobile stations (ML) according to the following scale:

Number of mobile stations (ML) per network	Spectrum fee
$ML < 5$	$1/10 * (U*P)$
$6 < ML \leq 10$	$1/7 * (U*P)$
$11 < ML \leq 20$	$1/3 * (U*P)$
$21 < ML \leq 35$	$1/2 * (U*P)$
$ML > 35$	$(U*P)$