

**FINAL REPORT FOR  
EC DGXIII/A1**

**The Future of  
Universal Service in  
Telecommunications  
in Europe**

Analysys

The Future of Universal Service  
in Telecommunications in Europe

FINAL REPORT

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## 0/ Executive Summary

This report presents the results of a study of the provision of public telecommunications services in the context of Open Network Provision (ONP). The focus of the study has been on the development of the concept of universal service in telecoms to ensure that the social as well as the economic objectives of the European Union are supported by the liberalisation of telecoms markets.

The study was undertaken between December 1995 and December 1996 by Analysys Ltd on behalf of the European Commission Directorate General XIII. The findings form the basis of a series of policy recommendations on the future development of universal service in European telecoms which we present to the Commission in this report.

The views expressed in this report are those of Analysys Ltd or of organisations interviewed in the course of the work; they are not necessarily the views of the Commission.

### 0.1 Background

Universal service has become an important issue in the European telecoms sector in recent years. This is a direct result of the measures to liberalise the European telecoms market which have been implemented by the Commission and the Member States of the European Union (EU). Liberalisation has rendered unworkable the traditional relationship between a monopoly provider of telecoms services and the government of the country in which it operates, whereby the telecoms operator (TO) offered basic telephony services to all citizens at the same price irrespective of their location in the country, in return for the State's protection of its monopoly.

The perception that monopoly TOs have delivered something approximating to universal service in most European countries has led to widespread discussion of what will happen

to provision of universal telephony service in competitive markets following liberalisation in 1998. There is a great deal of activity in the Member States of the EU to ensure that the provision of universal service will continue after the liberalisation of telecommunications markets. There is already agreement at an EU level of the costing and financing of universal service. In addition the Commission is due to report on the level quality and affordability of universal service at the end of 1997; this study is a contribution to that review process. Table 0.1 on the following pages summarises the position of universal service in each Member State at the time of writing (December 1996).

## **0.2 Study Approach**

A two-stage approach was taken to the study:

- a series of interviews was carried out with parties with interests and expertise in the development of universal service
- possible demand scenarios were constructed for technologies which could be considered for inclusion in universal service in the future.

Interviews were carried out with a wide variety of organisations in the EU and other parts of the world which have an interest in the development of the telecoms sector: these included National Regulatory Authorities, incumbent telecoms operators, new telecoms operators, consumer associations, user associations, regional development agencies, trade unions, social groups and organisations representing the disabled. Their views were an important input to the conclusions drawn by Analysys and the recommendations put forward to the Commission. In addition, we also spoke to organisations active in other sectors where universal service is an issue (electricity, gas, water and postal services). The experience of these sectors provide some valuable lessons for the telecoms sector.

The objective of developing technology and demand scenarios for emerging telecoms services was to determine whether emerging services are likely to penetrate the residential market to an extent which would qualify them for inclusion in universal service before 2005. The scenarios examined the possible penetration of the residential market (as a proportion of households) of cellular telephone and ISDN services. In addition, the study assessed the costs of extending universal service to include ISDN access to schools, hospitals and public libraries.

*TABLE 0.1: Summary of Universal Service Components in the EU*

**NBED wp 84**

	<i>Legal Status</i>	<i>Services covered</i>	<i>Same price in all places</i>	<i>Affordability specified</i>	<i>Deposits required</i>	<i>Low-user scheme</i>	<i>Disabled discounts</i>	<i>Full disconnection</i>
Austria	Legal obligation	Basic voice telephony	✓	✗	✗	✗	✗	✓
Belgium	Legal obligation	Basic voice telephony	✗ Line rentals vary	✓	✗	✗	✓ Funded by Belgacom	✗ Soft disconnection
Denmark	Legal obligation	Basic voice telephony, ISDN and leased lines	✗ Line rentals vary	✗	✗	✗ Pilot scheme in operation	✓ Funded by Tele Danmark	✓
Finland	Legal obligation	Basic voice telephony	✗	✗	✗	✗	✓ Funded from social welfare budgets	✓
France	Legal obligation	Basic voice telephony	✓	✓	✗	✓	✓ Funded by France Telecom	✗ Soft disconnection
Germany	Legal obligation	Basic voice telephony, directory services, public telephones	✓ After 1998 prices will vary below a ceiling	✓	✗	✗	✓ Funded from social welfare budgets	✓
Greece	None	None	✓	✗	✓ All new customers	✗	✓ Blind customers only	✓ Customers owing Dr15 000 or more
Ireland	None	None	✓	✗	✗	✗	✓ Funded by Telecom Eireann	✓
Italy	None	None	✓	✗	✓ All customers	✓	✗	✓

	<i>Legal Status</i>	<i>Services Covered</i>	<i>Same price in all places</i>	<i>Affordability specified</i>	<i>Deposits required</i>	<i>Low-user scheme</i>	<i>Disabled discounts</i>	<i>Full disconnection</i>
Luxembourg	None	None	✓	✗	Customers with poor payment record	✗	Special equipment funded by TO and welfare budgets	✓ After court proceedings
Netherlands	Legal obligation	Basic voice telephony and itemised billing	✓	✗	✗	✗	Special equipment funded by welfare budgets	✓
Portugal	Legal obligation	Basic voice telephony, leased lines and PSDN	✓	✗	Operator allowed to charge deposits but does not	✓	Special equipment funded by TO	✓
Spain	Legal obligation	Basic voice telephony	✓	✗	Customers with poor payment record, special circumstances; non-residents	✓	Discounts for customers on disability pensions	✗ Outgoing calls only
Sweden	Licence condition	Basic voice telephony, fax and data to 2400 baud	✗ Line rentals vary	✗	Depends on results of credit check	✓	Funded by welfare budgets	✓
UK	Licence condition	Basic voice telephony	✓	✗	Not required if credit limits agreed	✓	Funded by the TO licence holder	✓ Trial of disconnection of outgoing calls only

### 0.3 Conclusions from the Interviews

The interviews enabled Analysys to identify some fundamental principles for the development of universal service on which there is broad agreement among the interested organisations. The most important of these principles are summarised below.

#### *Principles underlying universal service*

- Universal service is concerned with ensuring access to essential telecoms services for citizens of the European Union. All reasonable steps should be taken to ensure that each household should have access to these services irrespective of financial circumstances, geographical location or disability.
- The purpose of universal service is to ensure that part of the population which would not receive essential telecoms services under normal market conditions has access to those services. Most citizens can afford to pay for telephone services delivered at prices which reflect the costs of providing those services. Universal service provision is required only to cover those citizens who cannot afford essential telecoms services at cost-based prices.
- While intervention in the telecoms market to stimulate the deployment of new technologies or services may be a laudable objective, it is inappropriate for universal service to be used as the mechanism for achieving it. Indeed, while universal service is necessary to prevent major inequalities in opportunities to participate in the Information Society, it is not a mechanism which should be used to drive the Information Society forward.

#### *Criteria for inclusion of new services within universal service*

- Universal service is concerned with the provision of services to citizens. Provision of services to business customers is outside universal service. Therefore the provision of mandatory services such as leased lines to meet the needs of business customers is a separate issue from universal service. However, business customers will benefit from the universal service requirements which improve overall service levels – particularly in those countries which qualify for assistance from the European Union Cohesion Funds. There is no requirement that prices for mandatory services such as leased lines be affordable, just that they be cost-related.



- Any service included in the definition of universal service should be essential, that is: it should have a high penetration among the population (penetration of at least 75% was suggested by a number of interviewees); and being without that service would constitute a social or economic disadvantage.
- Currently only basic telephone services qualify as universal services, as they are regarded as essential for full participation in modern European society. However, there are a number of services associated with basic telephony which are necessary for customers to be able to make full use of the service: directory enquiries, information about services and their prices, and provision of public payphones. Moreover, itemised billing, call barring and malicious call control services are necessary in addition to the basic services so that customers have information on their expenditure, can control exposure to large telephone bills and can filter out undesirable calls.<sup>1</sup> The social benefit from universal free access to emergency services via the telephone are self-evident and such access should be part of universal service.

#### *Affordability and tariffing measures*

- With the introduction of competition, the widespread practice of geographical averaging of tariffs in Member States will become unsustainable. Tariffs will reflect, on a regional basis, the costs of providing the service to that region.
- The concept of affordability cannot be defined in a meaningful way for populations either at a European level or at the level of the Member States. However, customers' willingness to subscribe to services can be enhanced by flexibility of payment terms through measures such as credit limits, frequent billing, flexible tariffs, and moving from deposits to more standard forms of credit control.
- Lessons from other sectors show how the numbers of disconnections from service can be dramatically reduced by introducing 'soft access' to the service. Prepayment schemes for telecoms customers could have a similar effect on customer disconnections in the telecoms sector.

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<sup>1</sup> All of these elements, with the exception of filtering services for malicious calls, are either currently within the scope of universal service as set out in the Voice Telephony Directive (95/62/EC), or are found in the current proposal to amend that directive (COM(96) 419).

### *Provision of public access*

- Providing telecoms services to schools, hospitals and other public institutions as a means of ensuring public access is outside the scope of universal service.

### *Lessons from other sectors*

Some lessons on universal service were learned by interviewing players from the electricity, gas, water and postal services in a number of different countries:

- Soft access reduces the barrier to taking up a service for those customers who may have difficulties paying for the service.<sup>2</sup> It eliminates the possibility of the customer getting into problems with debt, by ensuring that the customer only has access to the service when it is already paid for.
- Business customers are deemed to require significantly less protection and fewer guarantees of service than residential customers. This attitude is particularly visible in the UK gas and electricity sectors, and is founded on the belief that there is more competition for business customers.
- An essential service such as water supply can have different prices for different regions of the country, depending on the cost of providing those services. The prices which water companies in England and Wales charge domestic customers for water supply vary from one part of the country to another, with prices reflecting the costs of providing the water supply.

## **0.4 Conclusions from the Technology and Demand Scenarios**

One of the fundamental reasons for including a service in universal service is because the service has been widely taken up by private citizens. (The other major reason is that individuals who desire the service but are unable to subscribe to it would suffer significant disadvantage i.e. it is an 'essential service'.) In looking at services which may be considered for inclusion in universal service in the future, it is therefore important to consider their penetration of the residential market. Analysys thus forecast the penetration

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<sup>2</sup> Soft access describes an arrangement where a customer pays for a service in advance – access to the service depends on pre-payment, and without this the service is unavailable.

of mobile telephony and basic rate ISDN to see if it is likely that they will reach levels of penetration of the residential market by 2005 to warrant inclusion in universal service.

The technology and demand scenarios conclude that it is possible that mobile telephony might reach a sufficiently high level of penetration in the residential telecoms market by 2005 that it could be considered for inclusion in universal service, if it were considered to be an essential service. In this case, action would need to be taken to ensure affordable access for citizens who could not afford mobile services at cost-related tariffs. Extending geographical coverage of mobile networks to ensure 100% geographical coverage could also be required if mobile telephony is included in universal service.

Analysys's findings indicate that mobile telephony could be considered for inclusion in universal service because it is likely to reach 75% penetration of the residential market by 2005. An estimate of the cost of including mobile telephony in universal service in 2005 puts it at ECU520 million per annum. This amounts to slightly less than 1% of the expected total mobile revenues of ECU60 billion in 2005.

ISDN services do not approach the levels of penetration of the residential telecoms market in any scenario that would indicate that ISDN should be considered for inclusion in universal service.

Access to telecoms services for schools, hospitals and other public institutions has become intertwined with universal service. However such services have nothing to do with universal service in the sense of action to extend services to a small proportion of private individuals who are unable to afford the services at cost-related prices. However, there is a great deal of political importance attached to the provision of 'public access'. The European Parliament has recently called for a strategy for such public access in its resolution on universal service in a liberalised environment,<sup>3</sup> and similar proposals have been made in the USA.<sup>4</sup> In order to assess the cost of such public access provision, Analysys made provisional estimates of the cost of providing basic rate ISDN access to all schools in the EU and primary rate ISDN access to all hospitals and public libraries. These estimates are based on published tariffs rather than underlying costs and so should be viewed as a proxy for the actual cost of providing these services.

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<sup>3</sup> A4-0389/96 Resolution on the communication from the Commission to the Council, the European Parliament, the Economic and Social Committee and the Committee of the Regions on universal service for telecommunications in the perspective of a fully liberalised environment - an essential element of the information society (COM(96)0073 - C4-0205/96)

<sup>4</sup> FCC Federal-State Joint Board on Universal Services 'Notice of Proposed Rulemaking and Order Establishing Joint Board', CC Docket No. 96-45 8 March 1996. Source [http://www.fcc.gov/Bureaus/Common\\_Carrier/Notices/fcc96093.txt](http://www.fcc.gov/Bureaus/Common_Carrier/Notices/fcc96093.txt)

- Provision of basic rate ISDN to schools throughout the EU was estimated to cost almost ECU1 billion per annum. This figure includes rental for the ISDN lines, Internet access and annualised equipment costs over five years. However, it does not include connection costs or any usage charges which might be levied in addition to the fixed charges.
- The cost of providing primary rate ISDN access to all hospitals in the EU was estimated at ECU280 million in connection charges plus annual rental costs of ECU62 million; the annual charge is likely to be small in comparison with usage charges. A similar calculation to estimate the cost of a primary rate ISDN connection to each public library in the EU yielded a connection cost of ECU527 million with an annual rental cost of ECU118 million. In addition to the costs described above, usage is again likely to be a very significant cost.

However, no account is taken in the above calculations of the revenues generated by these services and so the net cost of provision will be significantly lower.

Finally, it is important to note that penetration of PSTN services in the future will begin to fall, as some households move away from fixed telephony to mobile telephony or to more advanced ISDN services. This may have implications for universal service in the future.

## 0.5 Recommendations

Analysys's recommendations on the future development of universal service, based on the insight gained from the consultation and scenario analysis are as follows:

### *Recommendation 1: The Nature of Universal Service*

Universal service is only concerned with access to essential services for that minority of potential residential users who want, and have not yet secured, access to the network under normal commercial conditions.

*Recommendation 2: Treatment of Business Customers*

Universal service should not be used to ensure provision of telecommunications services of higher quality or specification to business customers. The essential requirement that services be affordable applies only to residential customers.

*Recommendation 3: Service Penetration*

Universal service should not be used as a means of initiating the roll-out of new services which have yet to find wide market acceptance. We recommend that, for a service to be considered for inclusion in the universal service obligation, it ought to have already grown to an 75% market penetration under normal market conditions.

*Recommendation 4: Components of a Basic Telephone Service*

Universal service should be limited for the moment to the provision of basic telecoms services. Basic telecoms services should include basic voice telephony at a defined level of quality (in terms of speed of connection, speech quality, frequency of failure and time to repair), payphones, free access to emergency services, operator services, directory enquiries, malicious call complaints services. Itemised billing and selective call barring should be available to all customers at no additional charge above the basic tariff.

*Recommendation 5: New Technologies*

The initial support of new technologies could be embraced within a policy on public access which would create awareness and stimulate demand for new telecommunications technologies for very limited periods prior to their widespread acceptance by the market. In contrast to universal service policies, public access policies should be characterised by the diversity of the services supported and the limited period of support, and where possible should be achieved through a public-private partnership.

*Recommendation 6: Regulatory Restrictions on Technologies Used*

Where a telecoms operator has an obligation to provide universal service then that operator should be free to offer the service in the most economically efficient manner subject to constraints such as radio spectrum availability.

*Recommendation 7: Review of Services Covered by Universal Service Obligations*

The services which are covered by universal service should be subject to periodic review to assess whether additional services should be added, based on the criteria of market penetration and economic disadvantage.

*Recommendation 8: Tariff Packages*

A wide range of tariff packages which reduce the effect of prices as a barrier to entry for the un-telephoned should be available as a right.

*Recommendation 9: Credit Control vs Deposits*

The telecoms industry should adopt a range of standard forms of credit control used in most other competitive consumer markets, specifically the adoption of finance-based credit limits calculated on the basis of the customer's ability to pay and payment history. Deposits should not be required from customers.

*Recommendation 10: Billing Frequency*

Customers should be offered the option of being billed at the frequency which is most appropriate for their individual circumstances.

*Recommendation 11: 'Soft' Network Access*

Customers should have the option of soft access to the network through the use of prepayment for telephone usage.

*Recommendation 12: Responses to Non-Payment of Bills*

'Soft' disconnection should be the initial stage for the removal of service from a customer for non payment of a bill. Soft disconnection should be implemented for the billing period after that which a debt has been incurred.

*Recommendation 13: Disabled Users*

Universal service should compensate disabled users for the additional costs imposed on their use of the telephone service by their disability. This recommendation should be supported by the monitoring and dissemination of best practice within the EU.

*Recommendation 14: Public Access*

Public access policies targeted at providing new services to schools and hospitals are not part of a broader universal service policy debate and as such should have distinct

characteristics; in particular, such policies should encourage a diversity of technical and service offerings and be relatively short-lived.



## 1/ Introduction

Analysys Ltd is pleased to present this final report on “The Future of Universal Service in Telecommunications in Europe” to DG XIII/A/1 of the European Commission. This report is the culmination of a study which began in December 1995 and which involved Analysys in substantial research into the area of universal service as well as an extensive interview programme with parties interested in universal service.

### 1.1 BACKGROUND

Universal service has become an important issue in the European telecoms sector in recent years. This is a direct result of the measures to liberalise the European telecoms market which have been implemented by the Commission and the Member States of the European Union (EU). Liberalisation has rendered unworkable the traditional relationship between a monopoly provider of telecoms services and the government of the country in which it operates, whereby the telecoms operator (TO) offered basic telephony services to all citizens at the same price irrespective of their location in the country, in return for the State’s protection of its monopoly. The perception that monopoly TOs have delivered something approximating to universal service in most European countries has led to widespread discussion of what will happen to provision of universal telephony service in competitive markets following liberalisation in 1998.

Two issues have been particularly important strands of Commission policy in creating a regulatory structure for a competitive European telecoms market:

- cost-related tariffing
- non-discrimination.

Cost-related tariff rebalancing and non-discrimination have important implications for the future of universal service. Tariff rebalancing affects the affordability of services

by removing traditional subsidies on local calls and access charges. The principle of non-discrimination requires that the burden of universal service be shared between the players in the industry rather than placed on one incumbent operator.

However, when determining the future shape of universal service, telecoms regulators must take account of broader technological and social trends. Recent developments in technology and services indicate that businesses and individuals are on the brink of radical changes in the way they use information technology and telecoms. Increasing computing power and the explosive growth of the Internet promise to revolutionise access to information and the ability to process that information when accessed.

These and similar developments are the first steps towards the creation of the 'Information Society', in which computers and telecoms play an increasingly important role in the lives of European citizens. However, the approach of the Information Society is also generating debate about the risks of creating a gulf between information 'haves' and 'have-nots': a sizeable portion of society could be marginalised by an inability to access information available to the majority over information networks. Thus there is a need to identify the fundamental criteria which define whether a service should be included in universal service provision and to apply these criteria to new services other than telephony to see if they warrant inclusion. Finally, in order to ensure widespread access to the services which individuals require to participate in the Information Society, it is necessary that these services are not only universally available but also affordable.

The purpose of this study is to advance thinking on these topics to assist the Commission in its role of defining the future for universal service in European telecoms. The study has not been concerned with the issue of costing of universal service, as this is the subject of a parallel study.

## **1.2 Major Themes from the Literature on Universal Service**

This report seeks to address some of the fundamental issues surrounding the development of universal service, and to provide a detailed account of the status of universal service throughout the European Union.

This introduction summarises the key issues at the centre of the universal service debate, namely affordability, public access and the evolution of universal service. A detailed discussion of the literature which examines these issues is provided in Annex C.

### *Affordability*

The affordability of telecoms services is inseparable from more general issues on pricing policy. The general picture which emerges from our survey of National Regulatory Authority (NRAs) is that the affordability of telecoms services improves when the general level of tariffs is reduced at a faster rate than changes in general price indices.

While there is little serious debate which seeks to link the affordability of telecoms services to levels of income, the literature does include discussion of the extent to which changes in tariff levels affect the economic welfare of individual households, particularly low-income households. For example, in the case of US households, Perl (1986)<sup>1</sup> has argued that the poorest 30% of households are actually worse off when cost-based tariffs are introduced. More recently Wolak (1994)<sup>2</sup> has refined these arguments, and points out that although tariff rebalancing may result in a net gain to the majority of households, the cost increases from rebalancing fall disproportionately on low-income households (particularly those occupied by the elderly or in rural areas). Nevertheless, Wolak concludes that the burden from price changes is unlikely to be sufficiently large to drive these households from the network.

From our survey of NRAs and other groups concerned with universal service, it is clear that the debate over affordability has focused on 'controllability', that is the ability of individuals to control their expenditure on telecoms. In particular it is vital for low-income households to be able to control their expenditure; the unlimited liability faced by households subscribing to telephone services is a major source of concern, and it is also an inhibiting factor for those households which do not yet have a telephone. This problem has been recognised by a number of the NRAs, which are either seeking to introduce low-user schemes or to encourage the provision of novel tariff packages which give users control over their expenditure.

### *Evolution of the Concept of Universal Service*

A central issue in the current policy debate is that of extending the concept of universal service to include new services. It is argued that the main focus for the development of

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<sup>1</sup> Perl (1986), The Consequences of Cost-Based Pricing, in Miller, J., *Telecommunications and Equity*, North Holland.

<sup>2</sup> Wolak, F. A., (1994), *Can Universal Service Survive in a Competitive Telecommunications Environment? Evidence from the Consumer Expenditure Survey*, Working Paper, Department of Economics, University of Stanford, California, USA.

universal service should be completing the roll-out of an existing service and creating the circumstances which allow all households to be included within the network and have access to a specified service. Universal service is not regarded as a policy designed to anticipate market behaviour, rather it is intended to correct market failure. Given this perspective, the definition of new services which might be included within the universal service obligation must take into account the diffusion of services across a market. As a result, market penetration rates become the key measure used to decide which new services are included in a universal service obligation.

Within a given service offering, however, policy measures designed to give consumers greater control of expenditure would also be compatible with the above rationale for defining universal service obligations. The diffusion of digital network technologies makes it possible to include new services such as itemised billing and call barring in the definition of universal service.

### *Public Access*

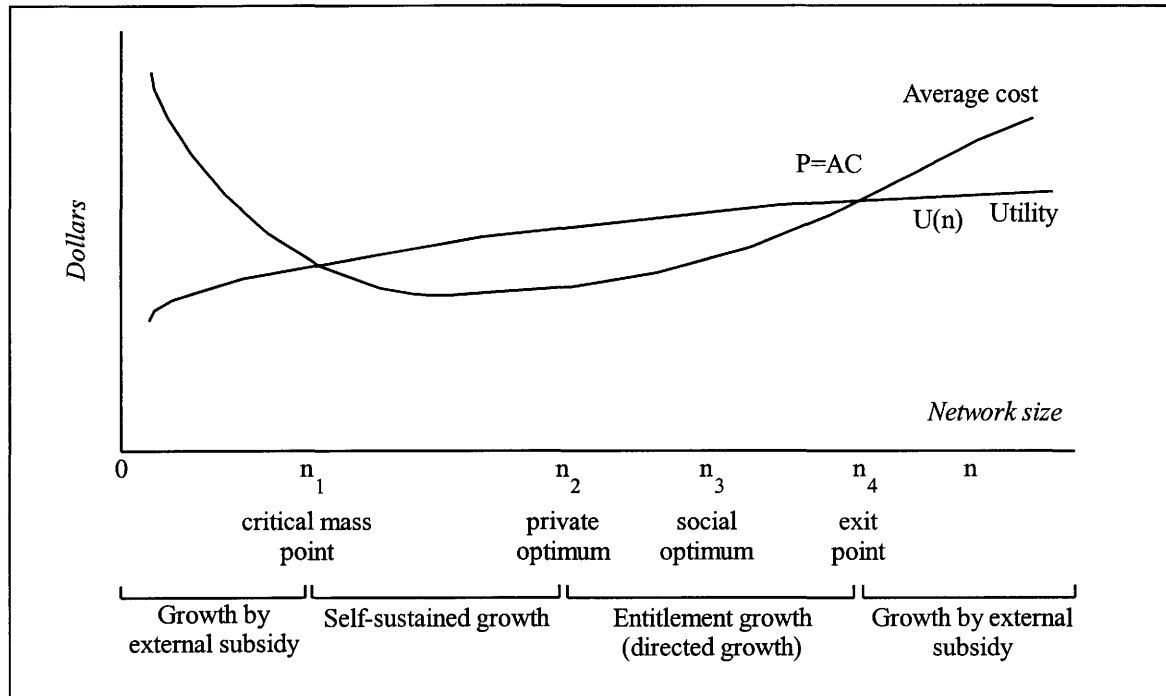
The debate over public access has been fuelled by broader discussions about the emergence of an Information Society and the need to avoid widening the gap between the 'information rich' and the 'information poor'. Attention has been focused on the rights of all individuals (citizens) to have access to broadband networks and services such as the Internet. Public access is now seen as a central issue in the debate over universal service, and is also involved in the debate about ISDN access for schools and hospitals.

It is important to distinguish the public access debate from the universal service debate. For public access the public policy issue is about initiating market-based behaviour and attempting to remove some of the first mover problems which exist in markets with rapid technological change. In contrast, universal service addresses the failure of the market to provide access to basic telecoms services; here the costs of service and the benefits of consumption are well understood. The difference between these two perspectives was elaborated in an article by Eli Noam and is illustrated in Exhibit 1.1.

To ensure public access, a public policy initiative should be designed to help suppliers and consumers make a more accurate and rapid estimate of the costs and benefits associated with a new technology than might be possible under normal market conditions. By definition, therefore, these policies should be of limited duration and targeted towards those new technologies which may provide the foundations of mass-market services (such as the Internet). However, in the case of a system technology, such as Internet, many of

the telecoms issues are dwarfed by usage charges and the funding of related technologies such as PCs, modems and in-building wiring.

**EXHIBIT 1.1:** Average Cost and Utility of a Telecoms Network, Plotted Against Increasing Numbers of Subscribers [Source: Noam, 1994]<sup>3</sup>



### 1.3 EU ACTIONS IN THE AREA OF UNIVERSAL SERVICE

The exclusion of citizens from society through poverty is a concern to the European Union both because of the aim of social and economic cohesion and because of the threat to society posed by disillusion among those who are excluded. In the Green Paper on social policy<sup>4</sup> the definition of social exclusion covers housing, education, health, and access to services as well as insufficient income. As we look forward to the Information Society, it is clear that access to services and information is emerging as a crucial issue for participation in society.

<sup>3</sup> Noam, E., (1994), "Beyond Liberalization III: reforming Universal Service", *Telecommunications Policy* 18(9) pps 687-704.

<sup>4</sup> Green Paper on *European Social Policy: Options for the Union*, COM(93)551, 17 November 1993.

When the Green Paper on social policy was being developed, DG XIII of the Commission was consulting interested parties on the review of the situation in the telecoms sector, following a communication from the Commission to the Council of Ministers and the European Parliament.<sup>5</sup> A major theme of the consultation process was the issue of universal service for basic telecoms services, and how this would be delivered in a competitive telecoms market. Indeed, the Council resolution which accepted the requirement for liberalisation of all voice telephony as a principal objective of EU telecoms policy added the provision that liberalisation should proceed “whilst maintaining universal service”.<sup>6</sup>

The Commission, recognising the importance of universal service, developed a proposal for a Council resolution on universal service principles in the telecoms sector.<sup>7</sup> This proposal discussed the concept of universal service and the reasons why it has become an important issue. The document raised two key issues: firstly, the factors which must be considered when deciding how to fund universal service, and secondly the effect of adjustment programmes (e.g. tariff rebalancing) on the implementation of universal service. This proposal provided a framework for the debate on universal service and aroused considerable political interest in the issue at both European and Member State level.

The Green Paper on the liberalisation of telecoms infrastructure<sup>8</sup> further advanced the thinking on universal service. It advocated that “transparent schemes for the determination of the cost of universal service obligations and their financing should be established”. It also said that the cost of universal service obligations to operators should be calculated as “the net cost of providing the service to uneconomic customers plus any cost associated with the provision of public telephones, emergency services and other social obligations”. The Green Paper also recommended that universal service costs should be met either through a universal service fund (to which all players in the telecoms market would contribute) or from access charges added to interconnection charges,

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<sup>5</sup> *Communication to the Council and the European Parliament on the Consultation on the Review of the Situation in the Telecommunications Sector*, COM(93)159, April 1993.

<sup>6</sup> Council Resolution of 22 July 1993 on the review of the situation in the telecommunications sector and the need for further development in that market 93/C213/01.

<sup>7</sup> *Proposal for a Council Resolution on Universal Service Principles in the Telecommunications Sector*, Communication from the Commission to the Council, the European Parliament and the Economic and Social Committee, COM(93)543 final.

<sup>8</sup> *Green Paper on the Liberalisation of Telecommunications Infrastructures and Cable Television Networks Part II: A Common Approach to the Provision of Infrastructure for Telecommunications in the European Union*, COM(94)682 final, 25 January 1995.

although a universal service fund was the preferred option. The funding mechanism should be administered by the NRA or by an NRA appointed body. The Green Paper concluded that the Commission and the NRAs should periodically survey main indicators of universal service such as penetration of residential lines, waiting times, provision of public pay-phones and the availability of targeted schemes for the needy and for uneconomic customers.

The Communication to the Council and the European Parliament following consultation on the Green Paper on liberalisation of telecoms infrastructure reported that the industry acknowledged the importance of universal service, but it should not be used as a reason to delay liberalisation. There was general agreement that the current approach of identifying universal service with basic voice telephony was appropriate, but that the concept could evolve with changes in technology and market demand. Market demand was felt to be a particularly important factor in determining whether a service should be covered by universal service.

The Communication also reported general support for the removal of political constraints on flexible tariffs and on the speed of tariff rebalancing, as these increased the cost of providing universal service. Among those consulted, universal service funds were the favoured funding mechanism, with a significant minority in favour of access charges. The importance of universal service to the development of peripheral regions was also asserted. On the basis of this consensus, the Common Position on interconnection of June 1996 defines universal service as “a defined minimum set of services of specified quality which is available to all users independent of their geographic location and, in the light of specific national conditions, at an affordable price”.<sup>9</sup>

The Voice Telephony Directive<sup>10</sup> includes a number of provisions relating to different aspects of universal service, such as targets for supply time and quality of service (Article 5), socially useful tariffs for low users or specific social groups (Article 14), provision of public payphones (Article 17), and the publication of procedures for dealing with customers who do not pay their bills (Article 23). An amendment to this Directive has now been proposed to clarify further the precise scope and affordability of voice telephony

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<sup>9</sup> Common Position (EC) No 34/96 adopted by the Council on 18 June 1996 with a view to adopting Directive 96/ /EC of the European Parliament and of the Council on interconnection in telecommunications with regard to ensuring universal service and interoperability through the application of the principles of open network provision (ONP), OJ C220, 29.7.96.

<sup>10</sup> The Application of Open Network Provision (ONP) to Voice Telephony Directive 95/62/EC of the European Parliament and of the Council, 13 December 1995.



services. These proposed changes result from a broad consultation on the Communication on universal service for telecoms in a fully liberalised environment.

The principles for costing and funding universal service obligations were established in the Directive on Full Competition and the Common Position on Interconnection, and were recalled in the Communication on universal service in a fully liberalised environment.<sup>11</sup> This Communication also considered the issue of affordability of services in more detail and began to look to the future and how universal service might evolve with the development of the Information Society. The elements which can be funded as part of universal service are identified in the common position on the Interconnection Directive.

According to the Full Competition Directive, national schemes for universal service must be notified to the Commission by 11 January 1997. In order to facilitate this process, the Commission adopted on November 27 1996 a Communication on criteria for the costing and financing of national schemes for universal service and guidelines for the operation of such schemes.<sup>12</sup> As announced in the Communication of 13 March 1996, the Commission will publish by 31 December 1997 a monitoring report on the scope, quality, level and affordability of universal service.

#### **1.4 OBJECTIVES OF, AND APPROACH TO, THE STUDY**

The objectives of this study, as agreed with the European Commission, are to provide:

- a clear picture of those public telecoms services for which there are regulatory obligations covering geographical coverage or price in each of the Member States
- a comparison with obligations in other sectors, such as electricity and gas supply, and postal services
- an assessment of ways in which the universal service concept for telecoms should evolve in the future
- proposals for possible future instruments and actions at the EU level.

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<sup>11</sup> Directive 95/62/EEC of the European Parliament and Council of 13 December 1995 on the application of Open Network Provision (ONP) to voice telephony, OJ L 321, 30.12.95.

*Universal Service for Telecommunications in the Perspective of a Fully Liberalised Environment: An Essential Element of the Information Society*, Communication to the European Parliament, the Council, The Economic and Social Committee and the Committee of the Regions, COM(96) 73.

<sup>12</sup> Commission Communication on Assessment Criteria for National Schemes for the Costing and Financing of Universal Service in Telecommunications and Guidelines for the Member States on Operation of such Schemes, COM(96) 608.

In order to achieve these objectives we pursued a range of approaches:

- a programme of interviews with National Regulatory Authorities to determine the nature of universal service obligations in each EU Member State and to discuss how these might develop (Chapter 2)
- a programme of interviews with players with interests in the outcome of the debate on universal service, including incumbent TOs, competitive operators, consumer associations, telecoms user associations, development agencies, trade unions, social organisations and organisations representing the disabled (Chapter 3)
- a programme of interviews with players in the gas, water, electricity and postal sectors to identify how these sectors implement the concept of universal service and whether it would be possible to use their best practice as an input to the debate on universal service in telecoms (Chapter 4)
- development of market forecasts for ISDN and mobile telephony services covering the period to 2005; these services are currently considered by some players to be potential universal services. In addition we have costed the inclusion of Internet access under universal service and special provision for access for schools, hospitals and public libraries (Chapter 5).

The results of each of these activities were used as the basis for a series of recommendations on the future development of universal service (Chapter 6). Annexes to this report include a list of the organisations interviewed, a summary overview of the options for funding universal service, and a review of the literature influencing current thinking on the status of universal service and ideas for its future development.

## 2/ National Regulatory Authorities and Universal Service

This chapter sets out the terms and conditions under which universal service is delivered in the EU and in a number of other countries. The data presented in this chapter has been derived from a programme of interviews with National Regulatory Authorities (NRAs) undertaken by Analysys, and from a review of documentation provided by NRAs and other relevant literature, including the raw data collected in the survey of NRAs recently undertaken by the European Commission.<sup>1</sup>

The chapter covers three major topics relating to the regulation of universal service:

- the legal status of universal service
- the services covered by universal service agreements, including any quality of service measures
- tariff issues relating to universal service, such as deposits, low user schemes, special tariff packages for the disabled and disconnection.

The data is presented in two sections, the first covering the environment within the EU Member States, and the second covering the countries studied outside the EU.

### 2.1 OVERVIEW OF UNIVERSAL SERVICE IN THE EU MEMBER STATES

The survey of the regulators and the review of primary source material makes it evident that, while universal service is a common policy construct across the EU, there are considerable differences in the nature of the policy and in its detailed implementation between Member States. In most EU countries a 'social contract' was negotiated between

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<sup>1</sup> This survey was carried out by DG XIII in late 1995 and early 1996.

the monopoly provider of telecoms services and the political institutions which sustained that monopoly position. Neither the detail of these contracts nor the basis on which the contracts were sustained were ever clearly articulated. Such contracts can be seen as an effective regulatory device that redistributed the monopoly rents earned by the incumbent through funding the extension of the network. However, this process was not necessarily always smooth: in some countries, broad inefficiencies created by such a monopoly market structure failed to deliver the extension of the network, and substantial waiting lists for access to the network existed.

In the emerging competitive multi-service, multi-vendor environment, the inconsistencies and lack of clarity of national universal service policies are being thrown into stark relief. If universal service costs are to be borne by more than one operator in a non-discriminatory fashion, then clear and transparent definitions of universal service and the obligations it imposes on operators will be needed. From an EU perspective it is desirable that some common understanding of universal service is arrived at and applied in all Member States.

At the time of writing (December 1996) there is a great deal of legislative activity relating to universal service being undertaken in the Member States. Every effort has been made to ensure the information provided on each Member State is correct. However, because so much new legislation is under preparation, it is possible that some of the descriptions contained here will have been superceded.

### **2.1.1 The Nature of Universal Service**

This discussion of the nature of universal service comprises two elements:

- the legal status of universal service, i.e. the basis on which it is provided
- the services covered by universal service agreements, including any quality of service measures.

Universal service can be said to exist in law in only two EU Member States – Austria and Spain. In most other countries universal service exists as a condition of the licence under which the incumbent and dominant firm operates. In five countries (Germany, Greece, Ireland, Italy, and Luxembourg) there is no formal description of what is meant by universal service, although there is usually mention in the incumbent TO's licence of an obligation to adequately provide for the telecoms needs of the State.

The Member States display considerable diversity in terms of the actual range of service covered universal service and the obligations placed on the operators to ensure quality of service. Both France and Sweden specify a range of services to be included: France Telecom must offer X25 and leased lines; Telia must offer fax and data transmission at 2400 baud. At the other extreme, there are five countries where there is no formal agreement as to what service(s) constitute universal service, as listed above.

Quality of service measures are an important element of the universal service debate because they establish the minimum acceptable threshold for service delivery. As operators confront increasingly intense competition, quality of service measures are a way of ensuring that the lower prices charged for telecoms services do not result in lower quality for those services. Moreover, for residential consumers, who have little negotiating power, quality of service measures imposed by the regulator act as a counterweight to the strength of the dominant carrier.

A country-by-country description of the nature of universal service across the EU is provided below.

### *Austria*

Austrian law places an obligation on the incumbent operator to provide telephony service and access to the public telephone network. This obligation is part of the Austrian Telecommunications Act which came into effect on 1 April 1994. Since that act, legislation governing the privatisation of the incumbent TO established the principle that costs borne by an operator in providing universal service should be funded; however, the means by which this funding is implemented are not yet specified. New telecoms legislation is expected to be enacted by the end of 1996. This legislation is expected to take a lead from the Voice Telephony Directive in its treatment of universal service.

Services must be provided to all citizens at a uniform price throughout Austria. Services must be delivered to wherever they are required on the property of the customer. The criteria for quality of service are laid down in the General Standard Terms and Conditions which apply between the Austrian TO (OPT) and its customers. These require OPT to maintain an up-to-date network and to provide customers with access to services within a reasonable time. The standard terms and conditions contain penalty clauses to compensate customers when OPT fails to meet the required standard of service.

## Belgium

In October 1996 a royal decree on universal service became part of Belgian telecoms law. The decree specifies that universal service includes basic telephony, free emergency calls, operator and information services, and public telephones. It requires that these services be made available to all Belgian citizens irrespective of geographical location and at an affordable price. The decree also requires telephony services to be provided at an 'affordable' price for schools, hospitals and public libraries, although the term affordable is not defined. There is no precise definition of quality of service, but there is a requirement that data communication must be possible using a good-quality modem, which the Belgian regulator (IBPT) interprets to mean that data communication at speeds higher than 2400bit/s per second is required.

There is a standard connection tariff for telephones in Belgium, and the telephone line is delivered to the part of the property specified by the customer. Rental charges vary slightly depending on the location of the customer; customers in large cities pay more than those in rural areas, because users in cities can reach many more customers for the price of a local call. Customers have a choice of a number of different rental packages which offer different levels of service:

- The basic package is *Abonnement au service de base*, which is the least expensive but requires the customer to pay for line repairs.
- The comfort package is *Abonnement confort*, which costs 16% more than the basic package but includes value-added services such as call waiting and call forwarding.
- The PRO package (*Abonnement PRO*) costs about 25% more than the basic package and offers the basic package plus a guaranteed repair service.
- The *PRO-COMFORT* package costs 40% more than the basic package and provides a combination of the value-added services plus the guaranteed repair service.

The basic and comfort packages offers customers a compensation payment of BF826 (ECU20) if service is interrupted for more than seven days. The PRO and PRO-COMFORT packages offer compensation of BF150 (ECU3.8) for each day the service is not fully functional. The Comfort and PRO-Comfort packages are only available on lines connected to digital exchanges, which currently make up 72% of telephone lines in Belgium.

Permanent call barring is available for an installation fee of BF500 (ECU12.5) plus a bi-monthly charge of BF250 (ECU6.3). A limited form of itemised billing is available, in which only international calls and calls to special services are itemised.

*Denmark*

New telecoms legislation came into effect on 1 July 1996 which established a legal framework for universal service in Denmark. The details of the framework law are gradually being defined by the Ministry of Technology, although the approach is to maintain as much flexibility as possible. The new legislation extended the scope of universal service to include basic rate ISDN and leased lines (up to 2Mbit/s), in addition to basic voice telephony.

Tariffs vary between the different regions in Denmark, with the most expensive tariffs being in Greater Copenhagen, in part reflecting the large number of users that fall within the local call area. The basic rule for tariffs under the new legislation is that they should reflect costs and that consumers should not be worse off than today. In the future, the regulator will set maximum tariffs from which prices may deviate provided that the new tariffs reflect costs

When Tele Danmark delivers a line to a customer, the line can be located anywhere on that customer's property for the uniform connection charge. Under the previous legislation it was clear that the network terminated in the home of the customer. Under the 1996 legislation, however, there is now some ambiguity as to the terminating point, especially in blocks of flats where some of the flats are served by a PABX and others are provided with direct access. The exact details of the network terminating point are to be settled through an executive order which has yet to be issued by the Ministry of Technology.

The new telecoms law requires the design and implementation of some basic quality criteria. Again, the detail of these quality of service standards are due to be settled through an executive order from the Ministry. There is a scheme to compensate customers for interruptions to service, under which subscription charges are reduced in proportion to the period of the fault, provided that the amount exceeds DKr25 (ECU3.4).

According to the National Telecoms Agency, there is no responsibility placed on Tele Danmark for the provision of directory enquiry services and payphones and it is not Tele Danmark's responsibility to pay for them. Tele Danmark is able to close any payphone it wishes unless the local authority is prepared to guarantee a minimum income which makes the payphone cost effective.

### *Finland*

Sections 8 and 9 of the Finnish Telecommunications Act state that it is the operators' duty to provide users with sufficient, secure and safe telecommunications under terms that are reasonable and non discriminatory. However, there is no obligation to provide service at the same price to all customers.

The Finnish government does have some rules regarding the quality of service that a telecoms operator must deliver, but believes that competition produces the best quality of service for customers. The Ministry carries out an annual study of the quality of service available from operators, which receives a considerable degree of publicity in Finland and forms a benchmark against which operators are evaluated.

Call barring and itemised billing are available for all customers connected to a digital exchange, which currently means about 95% of all customers. Network digitalisation is due to be completed by the end of 1996.

### *France*

The French Telecommunications Act of 1996 defines universal service as "the provision to the public of a quality telephone service at an affordable price". In addition to the basic telephone service the Act defines universal service to include information services, directory services (printed and electronic), provision of payphones in public places and the provision of free calls to emergency services. Any subscriber who requests telephone service from an operator with responsibility for universal service should receive it. The Act also specifies that a landlord may not prevent a tenant from installing a telephone. The Act currently names France Telecom as the operator responsible for universal service, although all telephone service providers are obliged to carry emergency calls free of charge. The exact conditions which will be imposed on those operators with responsibility for providing universal service (at least France Telecom) will be established through a State Council Decree after consultation with the Commission Supérieure du Service des Postes et Télécommunications.

The cost of universal service will be met by those organisations with licences to operate public telephone services (articles 33.1 and 34.1 of the 1996 Telecommunications Act). The costs will be measured using an appropriate cost accounting system, to be executed by the operators and monitored by the regulator. Until tariffs are fully rebalanced, there will be two mechanisms for compensating operators with universal service responsibilities:



- The costs incurred by operators as a result of unbalanced tariffs and the geographical averaging of prices will be recovered through an additional charge levied in the same way as interconnection charges (although the charge will be identified separately).
- The cost incurred by operators in providing special tariffs, public payphones, directory and information services will be refunded from a universal service fund to which network operators and *telephone* service providers will contribute.

As soon as tariffs are rebalanced, and in any case no later than 1 January 2001, the mechanism of additional interconnection charges will be abandoned and all costs associated with providing universal service (including the remaining cost of geographical averaging) will be recovered through the universal service fund.

In addition to universal service (which relates to telephony and associated services), the 1996 Telecommunications Act also specifies a set of mandatory services, comprising ISDN, leased lines, packet-switched data services, enhanced voice telephony services and telex. Access to these services must be provided by operators with universal service responsibilities (currently France Telecom) to customers throughout France without financial compensation. The obligation to provide universal services at an affordable price does not extend to these services.

The 1996 Telecommunications Act also institutes a review procedure for universal services whereby a report is to be submitted to the government and parliament every four years, following consultation with interested parties. Among other things this report will, where appropriate, recommend the inclusion of new services in the scope of universal service and review the list of mandatory services. These reviews are intended to ensure that the definition of universal and mandatory services keeps pace with market and technology developments.

Call barring and itemised billing are available to France Telecom's customers, on payment of a fee. Barring of all outgoing calls is subject to an initial charge of FF80.1 (ECU15) and a monthly charge of FF21.08 (ECU3.5). Other barring levels are available without an initial charge, but are subject to a monthly fee of FF12.65 (ECU2.4). Itemised billing is available at a charge of FF13.5 (ECU2.5) for the first 100 numbers itemised and an additional fee of FF8.43 (ECU1.6) for every additional block of 100 numbers or part thereof per bill.

### *Germany*

The German Telecommunications Act of 1996 devotes a chapter to the subject of universal service. This new legislation, which does not come into force until 1 January 1998, is the first time the concept has been formalised in German law. The law defines universal services as "a minimum set of telecommunications services for the public in respect of which a particular quality has been defined and to which every user shall have access irrespective of place of residence or place of work at an affordable price". The law goes on to describe who has an obligation to provide such services: all licensees in the relevant product market which have a share of at least 4% of the total sales in that market shall undertake to contribute to providing universal service. In other words, no special obligations are imposed on Deutsche Telekom. In the event that no licensee provides a particular universal service which a customer requires, the regulator will decide who should provide the service.

Where the regulator requires a licensee to provide a universal service, the licensee may claim compensation from a universal service fund for any long-term costs which are not met by income it receives by providing the service. The universal service fund is calculated to be the amount of compensation paid to operators for the losses incurred in providing universal service. Payments made into the fund are proportionate to the market share of those licensees with at least 4% of total market revenue.

The services covered by universal service are the subject of an ordinance by the government, which specifies the tariffs and service quality at which the services must be offered. A recent ordinance includes basic telephony, directory enquiries, public telephones and specific types of digital leased lines.

Itemised billing is available to all customers connected to a digital exchange for a one-off charge, currently DM19 (10ECU). Most telephone customers do not have access to call barring services, which are only available to users with ISDN access to the telephone network. Many services which are regarded as forming part of standard telephone access in other countries are only available to customers with ISDN access in Germany. 70% of residential customers are currently connected to a digital exchange, and it is planned that all exchanges will be digital by the end of 1997. Around 2 million of the 40 million telephone customers in Germany now have ISDN access to the telephone network.

When a customer requests a new telephone line from Deutsche Telekom, this is delivered to the edge of the property. Any additional wiring is subject to additional charges and can either be undertaken by Deutsche Telekom or a private contractor.

*Greece*

There is no explicit legal definition of universal service in Greek law and it is not defined in the OTE licence. However, OTE is obliged to “meet the telecommunications needs of the Greek people” and is perceived to have an obligation to provide basic telephony at the same price throughout the country. Where OTE can demonstrate that provision of infrastructure in remote areas is uneconomic, it is entitled to compensation from the Greek state for the losses incurred. When OTE installs new telephone lines they are delivered to the edge of the customer’s property. All further wiring on the customer’s premises and within buildings must be undertaken by private contractors.

OTE does not offer call barring services, although it is possible for customers to buy their own equipment which offers call barring capability. Itemised billing is only available to customers who are connected to digital exchanges; at present around 50% of telephone lines are connected to digital exchanges. There is no regulation of OTE’s provision of payphones in Greece, and although it provides operator and directory enquiry services it has no obligation to do so.

There are minimum quality of service standards which must be met for telephone customers throughout Greece. Article 22 of the National Circular (24/7/95) which amended the Telephone Act sets out the basic quality of service measures for OTE relating to fault repair times: as from January 1996, faults are to be repaired within three working days. If the repair is not completed within this period then “at the request of the subscriber or on the initiative of the OTE, any basic charges which may have been paid shall be refunded.”

*Ireland*

The 1983 Telecommunications Act which incorporated Telecom Eireann specifies that the operator is responsible for meeting the telecoms requirements of the State and between the State and other countries.<sup>2</sup> The Act does not impose any explicit obligations on Telecom Eireann but is widely interpreted as meaning that Telecom Eireann should provide basic telephony, directory services, public payphones and operator services to all customers at a uniform price throughout the country. In a very small number of cases, however, where the customer requesting connection lives in a particularly remote area, Telecom Eireann is

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<sup>2</sup> Article 14 of the Postal and Telecommunications Services Act 1983.

permitted to provide service at some time in the future when it is possible to do so more efficiently than with immediate connection.

Telecom Eireann also provides public telephones on an as-needed basis. Directory enquiry services are available, with two free enquiries per customer each month, and subsequent calls at a rate of IR£0.345 per minute. Call barring and itemised billing are available to customers with digital lines (currently about 80% of customers). Call barring of premium-rate services is available free of charge. The barring of calls to other types of number (international, STD, etc.) is subject to an initial fee of IR£16 with a monthly charge per line of IR£2. Itemised billing is subject to a surcharge of £3 per bill.

Under Article 110 of the 1983 Telecommunications Act the minister is empowered to direct Telecom Eireann to carry out Government policy decisions. This includes directives in cases where the minister believes that Telecom Eireann's practices are unreasonable or against the public interest. This article has never been invoked by the minister to force Telecom Eireann to provide universal service.

If, having directed Telecom Eireann to carry out a policy decision through the powers invested by Article 110, the minister is satisfied Telecom Eireann has sustained a financial loss over a period of 12 months, then Telecom Eireann is entitled to recover that loss by increasing its charges.<sup>3</sup>

The Department of Transport, Energy and Communications does not impose any quality of service obligations on Telecom Eireann, although quality of service measures are published from time to time. Telecom Eireann has introduced a customer charter which provides compensation of IR£20 for customers when it fails to install lines within 15 working days of the request for a line and compensation of IR£10 when it fails to clear a fault within 2 working days of the fault being reported. It is likely that this compensation scheme will be formally imposed by the regulator when the Voice Telephony Directive is transposed into Irish law.

### *Italy*

There is no explicit universal service obligation on Telecom Italia at the moment, but the terms of the 1984 licence agreement between SIP and the Italian government places an

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<sup>3</sup> Article 51: Postal and Telecommunications Services Act 1983.

obligation on SIP (and now Telecom Italia) to meet the telecoms needs of the Italian people. Telecom Italia currently provides basic telephony services throughout Italy at the same price. A set of minimum quality standards for basic telephony services is described in Telecom Italia's licence.

In August 1996 the government issued a provisional decree setting out a legislative framework for the telecoms sector. This decree should be presented to the Italian parliament and come into effect 90 days later, but this process is not yet complete. The provisional legislative programme translates the appropriate European legislation and directives relating to ONP and interconnection into Italian law. In terms of universal service, the legislation will specify voice telephony and leased lines as 'obliged services'. Until this law comes into effect Telecom Italia is operating under the terms of the existing legislation.

### *Luxembourg*

P&T Luxembourg does not have a licence and currently has no legal obligations relating to universal service. However, the new telecoms legislation is now being drafted which is expected to become law in late 1996 or early 1997. This law is expected to include a definition of universal service, although the exact definition is still a matter of political debate.

Basic telephony, leased lines and basic rate ISDN are available to all customers at a uniform price throughout Luxembourg. This is governed by commercial law which prevents providers of any national service from discriminating on the basis of subscriber location. Call barring is available free of charge to all telephone subscribers. Itemised billing is also available, for a monthly charge of LF50. At present itemised bills list every call, but a new system will soon be launched which is expected to allow different levels of itemisation. The Ministry expects that the most basic level of itemisation will be provided free of charge. P&T Luxembourg provides directory and operator services, although without obligation. The operator regards them as essential aspects of the basic telephone service. Directory services have been outsourced and there is some expectation that operator services will also be outsourced to organisations outside the TO.

The standard connection charge made by P&T Luxembourg is for delivery of a line to the edge of a customer's property. Extension of the line into the property incurs an additional charge and may either be carried out by the operator or a private contractor.

Mandatory quality of service standards for connection and fault repair times may be specified under the expected telecoms legislation; at present no such standards are laid down. However, the PTT currently expects to repair faults satisfactorily within five working days of notification by the customer. This quality of service measure is the basis of a compensation scheme which results in the reimbursement of the quarterly rental charge if requested by the customer. The Ministry does not believe it is necessary to impose technical quality standards, as the telephone network is 100% digitalised.

### *The Netherlands*

The 1989 Communications Act does not contain any specific obligations relating to universal service. However, the law discusses the notion of concessions which co-exist with the exclusive rights bestowed on the PTT. The concessions require the PTT to provide voice telephony (including itemised billing) at uniform tariffs, and to provide leased lines. There is no obligation to provide operator services. The 1989 Act and the 1996 Interim Telecommunications Act (passed on 1 July) are subject to revision; a new Act is likely to be passed in July 1997, to come into effect for 1 January 1998. It is intended that the new act will change the nature of the concessions regime laid down in the 1989 Act, and set out clear definitions of universal service and its funding.

The PTT defines its own quality of service measures, and has to report annually to the Concessions Board. The main criteria for quality of service are expressed in terms of repair times and 'delivery' times for new services (with next day connections required for new lines).

### *Portugal*

Portuguese telecoms law (40/95, passed in February 1995) laid down the basis for the formation of Portugal Telecom from the telephone companies which previously operated in Portugal. This law obliges Portugal Telecom to provide a universal service throughout Portugal without preference or discrimination, and covers basic telephony, a national help number for customers, access to information services and emergency services, and the publication and distribution of telephone directories for fixed telephone and telex services. Article 14 of the law also stipulates that leased lines and packet switched data network services must be provided when requested. Other documents relating to universal service

are a convention signed on 20 December 1994 on the pricing of telecoms services and an agreement on quality standards made between the regulator and Portugal Telecom.<sup>4</sup>

The 1995 law also describes how Portugal Telecom is compensated for the costs it incurs in providing universal service. At present, Portugal Telecom is entitled to recover most of its costs from its customers, via the tariffs levied for its services. The law also provides for allowances which can be made to Portugal Telecom to reduce the monopoly rents it pays to the Portuguese government. As part of this process Portugal Telecom is obliged to demonstrate its universal service costs to the regulator. Article 32 of the law describes how, in a future competitive market, the costs of universal service could be borne by all players, through the mechanism of a universal service fund. The law does not describe how this should be done.

The quality of service targets which Portugal Telecom has agreed with the regulator cover network infrastructure improvement as well as maximum times for installation of main lines, percentage of calls successfully completed, frequency of main line faults, speed of fault repair, maximum acceptable levels of billing complaints, and a variety of technical indicators relating to network performance. The concession contract describes penalties for failure to meet the specified quality standards in the form of maximum price variations and fines. Quality of service targets also exist for telex, telegraph and switched data services.

### *Spain*

Universal service provision in Spain is covered by a number of administrative documents:

- Law 31/1987<sup>5</sup> grants Telefónica monopoly rights in return for universal service obligations.
- The Telefónica concession contract of January 1992 sets out quality of service and coverage targets.
- The National Telecommunications Plan<sup>6</sup> sets out investment programmes for the development of telecoms services in rural areas. The current "Rural Telephone Extension Programme" is planned to be completed by the end of 1996.

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<sup>4</sup> Convention signed between the General Directorate of Competition and Prices – Communications Institute of Portugal (ICP), Portugal Telecom and Companhia Portuguesa Radio Marconi.

<sup>5</sup> Ley de Ordenación de Telecomunicaciones [LOT] as amended by Law 32/1992.

In addition, all special tariff schemes for specific groups of citizens must be authorised by the government. A consultancy study is currently being conducted which involves a wide-ranging review of universal service regulations in Spain. The results of this study should be known in 1997.

Following completion of the Rural Telephone Extension Programme (planned for the end of 1996) Telefónica will be obliged to provide a line at standard tariffs to any household in the Spanish territory. Telefónica is obliged to provide leased lines, X25 and ISDN on a non-discriminatory basis at standard tariffs and on standard terms and conditions. In 1993 Telefónica voluntarily promised to provide itemised billing free of charge to all households by 1998; by the end of 1995 itemised billing was available to around 65% of all lines. There are no obligations on Telefónica to provide call barring, and it has made no voluntary announcements on this issue.

There is no explicit funding mechanism for universal service, with financing currently provided via the cross-subsidy which is implicit in Telefónica's tariff structure. The brief for the consultancy study referred to earlier implies that the Spanish government currently favours the use of a managed fund to collect and distribute the net cost of universal service.

Until the Rural Telephone Extension Programme is completed, special arrangements apply to non-urban areas whereby Telefónica can levy a higher-than-standard (though cost-based) charge for the installation and rental of a basic telephony line. Once the Programme is completed, uniform tariffs will apply.

Telefónica normally provides a network termination point inside the customer premises, and bears the cost of in-building wiring. This is not a legal obligation, however, and in theory Telefónica could choose to terminate the access line at the edge of the property or the edge of a building.

The only published quality standards are those specified in Telefónica's concession contract (in 1995 the mean times achieved were three days for installation of a line and seven hours to repair a fault). Where quality standards are not met, compensation available for customers includes rental discounts if Telefónica fails to repair a fault within

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<sup>6</sup> The National Telecommunications Plan (NTP) is the government's planning instrument which forecasts investments to be made by Telefónica in the network. It is a series of four-year projections. The NTP should be seen as more of a government planning tool than a regulatory edict. Telefónica is not bound by the investment parameters outlined in the NTP, nor are there any direct enforcement provisions contained in the document.



6 days. If Telefonica fails to install a line within 20 days then it provides a free telephone handset to the customer. There are no published quality standards covering clarity of speech or speed of data connection.

### *Sweden*

Universal service is not imposed by legislation in Sweden, but is a condition of Telia's operating licence which was granted in October 1994. Provision 1.1 states that Telia "shall on similar conditions provide telephony services to a fixed connection point to anyone who requests such a service". As well as the licence there also is a civil agreement between the Swedish government and Telia which governs issues such as a price cap for services, low-user schemes, and provision of public payphones. The agreement was signed in July 1993 and is effective until 31 December 1996. It states that Telia will receive no compensation for the costs imposed by universal service and is forbidden from including these costs when calculating interconnection charges.

Annex 1 of Telia's licence relates to quality of service, and states that Telia must provide basic telephony services at a level of quality sufficient to allow fax and data communications by modem to 2400bit/s. Services such as outgoing call barring and itemised billing are available to customers who are connected to digital exchanges (currently 92% of lines). Outgoing call barring is currently provided free of charge, and itemised billing is available for a small charge each billing period. The connection charge paid by residential customers includes the location of a telephone point anywhere in a new building. Article 7 of Telia's licence obliges it to provide directory enquiry services to the public. It also provides operator services, but these are not subject to regulation.

Telia has an obligation to provide public payphones in Sweden. An annex to the agreement between Telia and the government lists those public payphones which must be provided by Telia. There is no procedure under the agreement for adding public payphones to this list. Telia has actually removed a small number of phones on the list, with the agreement of the regulator.

The charges for calls in individual call bands are uniform throughout Sweden. However, rental charges do vary according to the geographical location of the customer; higher charges are imposed in the large cities, on the basis that customers can reach a much larger number of users at local call rates. Connection charges also vary, according to whether the line is to a main residence or a second residence: lines to a main residence are subject to a standard connection charge, but connection of second residences can be subject to a higher

charge to reflect higher cost incurred by the operator. Telia is obliged to provide analogue and digital leased lines in accordance with the terms of the Leased Lines Directive.

Annex 1 of Telia's licence contains several quality of service measures, the most important of which are:

- Connection time for main lines to the main residence or place of business are not to exceed 17 days from the application for connection
- The delay between fault reporting and fault repair should not exceed two days, and 55% of reported faults are to be dealt with within eight hours
- The rate of successful connections for calls during business hours should normally exceed 98%, and must never fall below 96% for calls within a single local exchange.

Under the compensation scheme associated with these quality of service measures, if a service quality level is not achieved the customer is entitled to a discount on the quarterly fee. Telia is not obliged to provide compensation; the scheme is a voluntary arrangement designed to improve customer relations.

## UK

Universal service is the subject of Conditions 1 and 2 of the licences issued by the UK government to BT and Kingston Communications. These conditions state that the operators must provide basic voice telephone services to all customers at a uniform price throughout their areas (according to interpretation of condition 17), and explicitly confirm that this obligation covers rural areas. The licences also impose obligations to consult with the Director General of Telecommunications on the supply of telephone apparatus for the disabled and the deaf (including the provision of at least one type of telephone to assist hearing-impaired people), the funding of a text relay service, and the installation of inductive couplers in all public call boxes (conditions 31 to 33).

BT residential customers are entitled to compensation equivalent to a month's rental for each day of loss of service over an agreed period up to a maximum of £1000. This compensation is available for installation which is not completed on the day agreed, or fault repairs which are not completed by the end of the working day following the report of the fault.

The UK is currently proposing to revise its definition of universal service, extending it from "affordable access to basic voice telephony or its equivalent for all those reasonably

requesting it regardless of where they live” to “affordable access to basic telecommunications services for all those reasonably requesting it regardless of where they live”.

### 2.1.2 Affordability Issues

Affordability of services is central to the concept of a universal service. This section discusses three major issues relating to affordability:

- whether an initial deposit is required from the customer
- whether discounts on services are available to people considered to have ‘special needs’
- the nature and speed of the disconnection process which comes into effect when customers are unable to pay their bills.

Many operators require a deposit from some or all of their customers to insure against bad debts. Deposits are requested from customers at the same time as payment of sometimes substantial connection charges, and the combined effect is to deter some potential customers from subscribing to telephone services.

The Member States and operators vary in their attitude towards tariff packages designed to ease the burden of telephone ownership for people who might have difficulty affording access to the network under the same terms as the majority of the population. Member States can impose the burden of these schemes on the operator as part of its universal service obligations, or it can be met by the government itself through social welfare budgets. Occasionally, the operators offer such packages on a voluntary basis. A variety of special schemes exist:

- **Low user schemes**, where discounts (usually on line rental) are offered to customers whose use of the telephone is below a certain threshold. For instance, a customer in France will receive a rebate on rental if usage in a billing period is less than 26 telephone units. These schemes are designed to ensure that the deterrent effect of the rental charge is reduced for those who are not heavy users of the telephone. These schemes may have income thresholds (as in Spain), or may be open to all telephone users regardless of income (as in the UK and France).
- **Schemes for the disabled**, where allowances are made for the special requirements of disabled customers. Where such schemes exist, they usually take the form of

discounts on special equipment required, such as teletype terminals for the deaf. Operators can also be required to allow communication between a customer using a teletype terminal and a customer with a normal telephone handset. In the UK, users of teletype services receive a 60% discount on the call charge portion of their phone bill (up to a maximum of £160 per year) to compensate for the extra time required for communication in this way. Schemes for visually impaired users include free access to directory enquiry services to compensate for their inability to use printed telephone directories.

- **Schemes for other groups such as the elderly or the unemployed**, where special discounts are available for elderly customers who live alone or families on a low income. These schemes are funded from social welfare budgets more often than low-user schemes or schemes for the disabled.

The majority of countries disconnect customers who fail to settle their bills, although there are variations in the procedures triggered by non-payment of the bill and the stages towards disconnection. In Spain, France and Belgium the policy is to implement 'soft disconnection' whereby all outgoing calls are barred until the bill is paid.

The specific arrangements in each Member State are discussed below:

### *Austria*

#### *Affordability*

There is no explicit provision relating to the affordability of services, and no legal definition of affordability. The law obliges telephony and leased line tariffs to be cost-orientated. In addition all prices must be approved by the Minister with responsibility for telecoms, who acts on advice from a telecoms pricing commission.

#### *Billing*

OPT customers are normally billed every two months, although it customers prefer they can be billed every three months. There is a facility for customers who have a digital line to be sent a warning letter when their bill exceeds a certain threshold. This service is free of charge for customers who accept the default threshold for warning letters (ATS10 000, ECU715); the charge for altering the threshold is ATS20 (ECU1.4).

*Deposits* Customers are not required to pay a deposit for telephone service.

*Special tariff schemes* There is no special treatment for low users. However, there is some provision for people on low incomes, such as students and the elderly. It is the customer's responsibility to apply for these schemes, which are funded from social welfare budgets.

*Debtors and disconnection* A customer who fails to pay a bill receives a number of reminders. Eventually, failure to pay results in complete disconnection from the network. A customer who has been disconnected is entitled to reconnection when all debts have been repaid, with no obligation to pay a deposit to insure against future bad debts.

There is a settlement procedure for billing disputes, although this can take some time to complete. Customers are not disconnected while they are disputing a bill with the OPT, provided they pay a sum corresponding to their typical telephone expenditure. If the settlement procedure fails to produce a mutually acceptable outcome, the dispute can be taken to the courts.

## *Belgium*

*Affordability* Affordability is mentioned in the royal decree of October 1996, although only in the context of providing services to schools, hospitals and public libraries, and there is no legal definition of affordability.

In future, telephone services in Belgium will be subject to a form of price cap control. The level of the price cap has not yet been determined.

*Billing*

Belgacom's customers receive a telephone bill every two months. It is possible for customers to obtain intermediate bills which only cover usage charges, with a minimum billing period of eight days. A charge of BF150 (ECU3.8) is levied for each intermediate bill provided.

*Deposits*

Until June 1995 all Belgacom's customers were obliged to pay a deposit equivalent to two months' rental and usage payments, to insure Belgacom against non-payment of bills. This practice has been discontinued and all customers are currently having their deposits refunded over a 24-month period in the form of a rebate on each bi-monthly telephone bill.

*Special tariff schemes*

Article 18 of the management contract between the Belgian State and Belgacom allows for innovative tariff schemes for "social and humanitarian reasons".

The most important of these reduced tariff packages is the social telephone rate. This tariff is available to people aged 65 and over who live alone or with up to two other people, and to people with disabilities who are deemed to be at least 66% incapacitated. The social telephone rate provides reductions on both connection and rental charges (70% and 50% respectively), and includes 50 free units in each two-month billing period for calls within Belgium. Approximately 370 000 customers have benefited from this scheme, equivalent to just over 8% of all connections (business and residential).

*Debtors and disconnection*

The royal decree on universal service of October 1996 states that customers who cannot pay their telephone bill should not be disconnected from the telephone network. Where a customer can demonstrate hardship, outgoing calls are barred but incoming calls are allowed, as well as access to emergency services and toll free numbers. Customers who refuse to pay (i.e. cannot demonstrate financial hardship as the reason for failure to pay) are disconnected from the network.

*Denmark*

*Affordability*

There is no formal definition of affordability, but existing policy is intended to provide the "best and cheapest telecommunications services in the world". Downward pressure on prices is seen as one of the keys ways of improving affordability.

*Billing*

The standard arrangement is for customers to be billed every three months, but customers have the option of receiving monthly bills. Tele Danmark can charge for more frequent billing.

*Deposits*

Provision exists for deposits to be charged if for any reason Tele Danmark believes that a consumer may not be able to meet his obligations.

*Special tariff schemes*

Until recently, Danish telecoms legislation prohibited discriminatory pricing, and no low-user schemes are currently available. However, the new telecoms legislation which came into effect in July 1996 allows discounts to be offered for low users, and it is likely that Tele Danmark will introduce such a scheme because of the associated public relations benefits: at present, Tele Danmark is piloting a low-user scheme. There are no other schemes for offering reduced bills. Schemes which reduce prices for users who can be served at lower cost to the operator are allowed by the regulator, but no scheme has been introduced by Tele Danmark.

Text phones are available for the deaf, at charges similar to those for an ordinary telephone. A relay service is also provided where a Tele Danmark employee acts as an interface between a text telephone and an ordinary phone. This service is provided at normal usage rates.

*Debtors and disconnection*

Customers who fail to pay outstanding bills are completely disconnected, usually about six weeks after the initial bill and four weeks after a reminder letter. Access to the network is restored on repayment of the debt (or agreement on a schedule for repayment) plus a reconnection fee of approximately £20.

Tele Danmark distinguishes between those customers who have been disconnected (i.e. because of unpaid bills) and those with whom the contract has been terminated. Where a contract has been terminated a customer is treated as a new customer and must both settle any outstanding debts in full and pay another connection fee before service can be restored.

*Finland*

*Affordability*

There is no formal definition of affordability in Finland. However, according to section 22 of the Telecommunications Act, the Ministry of Transport and Communications can issue specific rules on tariffs if the needs of customers are not well served.

*Billing*

Customers are able to establish credit limits with their service provider and/or pay for services in advance. However, customers do not have a legal right to this service.

*Deposits*

Operators in Finland do not require deposits from customers although they have the right to do so. They can agree a credit limit with customers, to reduce their exposure to bad debts, and can also ask customers to demonstrate in advance their ability to pay their telephone bills.

*Special tariff schemes*

There are no low-user schemes in Finland. Special services for the disabled, specifically for users with impaired hearing, are financed from the government's social welfare budgets. Around FIM 3 million (around ECU500 000) are granted to this form of support which includes some support for the text phone exchange.



*Debtors and disconnection*

Operators can disconnect a customer when:

- the customer fails to pay for telephone services
- bankruptcy proceedings have been initiated against the account holder.

If a customer can demonstrate that non-payment is a result of illness, unemployment or another related reason then a further month is allowed for settlement of the debt.

In the case of non-payment disconnection is not allowed in any of the following cases:

- i the bill is paid within two weeks of payment being requested
- ii the payable bill does not exceed FIM300
- iii the user disagrees with the level of the bill but pays that proportion of the charges which are not in dispute
- iv the operator has failed to follow the due procedures prior to disconnection.

*France*

*Affordability*

The definition of universal service contained in the 1996 Telecommunications Bill states that telephony services must be provided at an affordable price. However, the bill includes no definition of the term affordability.

*Billing*

Residential customers of France Telecom currently receive a bill every two months. It is not possible to change this billing frequency nor is it possible to agree a limit on telephone spending in a billing period. France Telecom does not warn customers of unusually large telephone usage before the end of a billing period.

*Deposits*

France Telecom's customers are not required to pay deposits.

*Special tariff schemes*

France Telecom's low-user scheme takes the form of a rebate on the subscription tariff. The rebate applies to users who make a small number of calls in a billing period (fewer than 26 units). A line which makes no calls at all in a billing period does not receive the rebate; this is to ensure that telephones in places such as lifts do not qualify for the rebate.

Connection charges are waived for people aged over 65 who qualify for certain benefits. Injured war veterans or Resistance members receive 50% discounts on rental and 40 free units per month. In addition, the visually impaired qualify for free access to directory enquiries.

The 1996 Telecommunications Bill foresees the introduction of additional schemes, particularly those targeted at low-income users.

*Debtors and disconnection*

When France Telecom's customers have difficulty paying for telephone services, they can contact the operator to arrange an instalment plan for repayment of the debt. As a way of reducing their future exposure to debt, customers can also request restrictions on the service available to them (e.g. the ability to make local calls only, national calls only, or no outgoing calls).

The 1996 Telecommunications Bill states that in the event of non payment, a minimum service should be maintained, so that some categories of debtor who have been identified as facing financial difficulty can continue receive calls and make calls to free services and emergency services for a period of one year.

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*Germany**Affordability*

The Telecommunications Act of 1996 requires universal services to be made available at an affordable price. A mechanism will be established to protect customers in areas where the cost of providing telephone services is high. This will involve defining the maximum amount which can be paid by a 'typical customer' (defined by typical calling patterns) for basic telephone services from 1 January 1998 onwards to be the amount which that customer would have paid for those services on 31 December 1997. From 1 January 1998, operators will be able to offer services at a price lower than this limit; the discount will vary depending on the costs of providing service.

*Billing*

Residential customers of Deutsche Telekom are billed each month. There is no possibility of agreeing a different billing frequency. There is also no option for agreeing a credit limit with Deutsche Telekom which would limit expenditure on telephone services in a billing period.

*Deposits*

Deutsche Telekom does not charge its customers deposits although it has the right to do so if it chooses.

*Special tariff schemes*

There is no scheme for low users in Germany, despite support for such a scheme from the Ministry. Deutsche Telekom is only willing to offer discounts for high-volume users and in the form of 'friends and family' schemes. There is a reduced tariff scheme for elderly, disabled and low income groups. These special groups receive a DM5 reduction on rental charges and 30 units free of charge per month. All assistance which is available is funded voluntarily by Deutsche Telekom.

*Debtors and disconnection*

When a customer fails to pay a bill, a warning is issued, and continued failure to pay results in disconnection.

*Greece*

*Affordability*

There is no mention of affordability of telecoms services in Greek law or in OTE's operating licence. Tariffs are entirely at the discretion of OTE. Although the government has no explicit control of tariffs, it does appoint (and has power to remove) the Director General of OTE.

*Billing*

There is no mechanism for customers to agree financial limits on telephone expenditure with OTE.

*Deposits*

OTE requires deposits from all new customers. This a matter for OTE and is not subject to regulation by the Ministry of Communications.

*Special tariff schemes*

There is no low-user scheme in Greece.

No special provision is made to improve access to the telephone network by disabled users. However, specific provision is made for blind users; under Law No. 2257 (1994) they receive 150 units of calls per month free of charge on their first main line subscription. Employees of OTE receive 300 units of telephone usage free each month.

A scheme is currently being considered for organisations to negotiate special tariffs from OTE. Any discount granted in this way is entirely at the discretion of OTE, provided that general competition regulations are observed.

*Debtors and disconnection*

A customer who fall into arrears are given a number of warnings. Customers are only disconnected from the network if their arrears are more than Dr15 000 (ECU50). This disconnection is temporary and customers can be reconnected if they repay their debt within six months of disconnection. However, customers who fail to clear their debt within this time are permanently disconnected from the network.

*Ireland*

*Affordability*

All tariff increases planned by Telecom Eireann are currently subject to the approval of the Minister for Transport, Energy and Communications. Once the independent regulator is in place (expected by the end of 1996) Telecom Eireann's prices will be subject to a price cap regime.

*Billing*

Telecom Eireann's residential customers are billed every two months. There are no exceptions to this billing frequency.

*Deposits*

Telecom Eireann does not generally require deposits from its customers.

*Special tariff schemes*

There is no explicit low-user scheme. However, all subscribers who are in receipt of an old age pension or disability pension and live alone have their line rental charges paid by the Department of Social Welfare. Subscribers who do not live alone may, at the discretion of the Department of Social Welfare, also have their rental paid in special circumstances (elderly and infirm couples, elderly couples who live more than a specified distance from a public telephone, elderly people living with others all under the age of 18).

The operator does not subsidise special equipment for the deaf (Minicom), although VAT refunds are available from social welfare funding. Because this type of communication is slow, users are given a discount of 70% on usage charges (subject to an annual maximum of IR£162 [ECU206]). This scheme is administered by the National Association for the Deaf. Directory enquiry services are provided free of charge for the visually impaired.

*Debtors and disconnection*

Customers who fail to pay their bills may ultimately be disconnected, although the procedure for non-payment goes to some lengths to try to avoid disconnection. Users have the right to be reconnected once they have cleared their arrears but are charged a reconnection fee of IR£15 (ECU18). Telecom Eireann does not generally seek a deposit from customers who have previously defaulted on payment, although in a small number of cases it may require a deposit or other form of security.

*Italy**Affordability*

There is no explicit definition of affordability in Italian legislation.

*Billing*

Customers are billed every two months and no variation is possible.

*Deposits*

All Telecom Italia customers are required to pay a deposit when they are connected to the network.

*Special tariff schemes*

Telecom Italia operates a low-user scheme. Low-user rental is L8300 (ECU4.3) per month, a discount of L4550 (ECU2.3) on the normal subscription. The first 50 units per month are charged at L50 (ECU 0.023) per unit, the next 60 are L346 (ECU 0.18) per unit, and all subsequent units are L127 (ECU0.066) per unit. The scheme is available to all customers upon request.

At present, Telecom Italia makes no provision for the disabled, but this issue has been the subject of political discussion. Before addressing the issue of access for the disabled, the Italian Ministry is waiting for the Commission to make its position clear on this and other matters.

*Debtors and disconnection* Customers who fail to pay their bill are given a number of warnings. Continued failure to pay results in complete disconnection from the network. Disconnected customers have the right to be reconnected when they have settled their arrears in full.

*Luxembourg*

*Affordability* There is no explicit definition of or control over the affordability of telecoms services in Luxembourg, although all price changes for voice telephony services are subject to government approval.

*Billing* All residential customers receive monthly bills from P&T Luxembourg. No other billing periods are available for residential customers. It is not possible to agree financial limits on telephony usage in a billing period, although customers are able to find out how much is owing on their bill at any time during the billing period.

*Deposits* Customers with a history of poor payment of telephone bills can be asked to pay a deposit to insure against future payment difficulties. However, Luxembourg consumer law means that customers cannot be required to pay a deposit. In fact, customers do sometimes pay the deposit as this can result in faster reconnection to the network.

*Special tariff schemes* There is no low-user scheme in Luxembourg, the main justification being that the basic telephone tariffs "are still very low". P&T Luxembourg provides special equipment to allow disabled people to communicate over the telephone network. This equipment is funded by the TO or by social security funding, with assessment on a case-by-case basis.

*Debtors and  
disconnection*

Customers who fail to pay their bill are sent a reminder. If no action is then taken, the TO institutes court proceedings under Luxembourg's consumer protection laws. The court tries to find a way for the customer to pay the amount owing and so remain connected to the network. If the court cannot find a solution, the TO is free to disconnect the customer. The customer is entitled to be reconnected on repayment of the arrears, but can be asked for a deposit to cover future payment difficulties.

*The Netherlands*

*Affordability*

There is no formal definition of affordability. However, the general position adopted is that improvements in affordability are achieved through price controls which prevent prices from increasing at a rate equal or greater than inflation.

*Billing*

Customers are not able to vary the billing terms which are defined by the PTT, nor can they establish financial credits with the PTT.

*Deposits*

Deposits are not required from customers. A history of poor payment or credit risk is not seen as justification for payment of a deposit.

*Special tariff  
schemes*

Low-user schemes are not allowed, as they are seen as giving preferential access to one group of customers over others; the 1989 Communications Act would need to be amended before such a scheme could be introduced. However, some form of discretionary support is available for disabled users, through the Ministry of Social Affairs. This support is for the purchase of special equipment, and does not provide tariff subsidies. No schemes are available to help groups such as the elderly.



*Debtors and disconnection*            If a customer is unable to pay a telephone bill and all possibilities for payment have been exhausted, the customer is disconnected from the network. Before the customer can be reconnected, all debts must be settled and the standard connection fee must be paid; in effect, the customer is treated as a new customer.

*Portugal*

*Affordability*                There is no legal definition of affordability for telecoms services in Portugal.

*Billing*                        Residential customers are billed monthly by Telecom Portugal; no other arrangements are possible.

*Deposits*                      Portugal Telecom does not require deposits from its customers. It is, however, entitled to ask for deposits if it so chooses.

*Special tariff schemes*        Portuguese law (40/95 passed in February 1995) obliges Portugal Telecom to provide special discounts for vulnerable customers such as pensioners. Pensioners whose income is below the national minimum wage receive a 60% discount on line rental and 25 free units of telephone usage per month. Portugal Telecom is also obliged to provide special equipment for disabled customers with special needs (such as inductive couplers for users with impaired hearing).

*Debtors and disconnection*    A customer who has failed to pay a telephone bill is given warnings that the debt is outstanding. If these warnings are not heeded and the customer fails to contact Portugal Telecom, the line is fully disconnected. When the debt is cleared the customer can be reconnected to the telephone network.

*Spain*

*Affordability*

There is no administrative definition of affordability, although a definition is expected to be established during 1997 following completion of the consultancy review which is currently underway.

*Billing*

Residential customers are billed every two months. Customers cannot agree limits on their telephone expenditure with Telefónica.

*Deposits*

Telefónica only requires deposits from customers who have a history of non-payment of phone bills, non-residents and under other special limited circumstances. Telefonica's policy on deposits is subject to regulation by the Spanish Government.

*Special tariff schemes*

There are no low-user schemes. People who are in receipt of retirement or disability pensions and whose pensions and phone usage are both below the stated thresholds, receive discounts on installation and rental charges (but not on call charges). Tariffs for other services are used to fund these discounts.

*Debtors and disconnection*

20 days after the deadline for settling a bill, Telefonica may suspend service, although typically it only suspends outgoing calls. Thereafter, Telefónica may serve customers with a notice warning that the contract will be cancelled within 10 days. Before customers are reconnected, they must settle all outstanding bills and associated penalties and pay a reconnection charge. In some cases, Telefónica also requires payment of a deposit.

*Sweden*

*Affordability*

There is no explicit reference to the affordability of universal services in Sweden. The topic is currently being discussed as part of the debate in advance of new telecoms legislation which is expected in mid-1997. However, no definition of affordability has yet been agreed. Article 2 of the agreement between the Swedish government and Telia imposes a price cap of RPI-1% on some of Telia's charges for domestic customers.

*Billing*

Telia's residential customers are normally billed every three months, although the billing frequency is flexible and bills can be issued at any reasonable frequency requested by the customer.

The idea of agreeing credit limits for customers has been discussed but this option is not yet available. Telia does offer a facility for customers to be sent a warning if their expenditure in a billing period exceeds an agreed threshold. This threshold is normally SKr5000 (ECU600), but a different threshold can be agreed between the customer and Telia.

*Deposits*

Where Telia deems that a new customer is not credit-worthy (following a standard credit check), it can ask the customer to pay a deposit of up to SKr5000 (ECU 600), although the level of the deposit is usually set in accordance with expected call patterns. The deposit regime is determined exclusively by Telia, although it is subject to Sweden's general consumer legislation.

*Special tariff schemes*

The agreement between Telia and the Swedish government specifies that there must be a low-user tariff for Telia customers. The exact nature of the tariff is left up to Telia, but the rental tariff must be reduced by at least 30% and there must be no charge for converting to this tariff. The agreement does allow Telia to raise usage charges.

The low-user scheme chosen by Telia offers a discount on rental charges of SKr100 (ECU12) per quarter.<sup>7</sup> Call charges are double the normal rate. If a customer makes a large number of calls and the resulting bill is SKr50 (ECU6) or more higher than the bill for a normal telephone user, the bill is automatically recalculated at the standard tariff, plus an additional charge of SKr50.

Telia's licence obliges it to provide a free directory enquiry service to disabled customers who are unable to use standard telephone directories. It must also provide intermediary telephony services for speech/text communication at the same price as communication made directly between users. Telia receives a 'cost-orientated compensation' for providing these services for the disabled. The compensation is paid by the Swedish government via the regulator.

*Debtors and disconnection*

If a customer is unable to pay a telephone bill and all possibilities for payment have been exhausted, the customer is disconnected from the network. A customer normally receives one warning and one final demand before disconnection. The procedure was devised by Telia and is not regulated. No attempt is made to distinguish customers who cannot pay from those who are simply unwilling to pay. Some years ago Telia experimented with a scheme whereby customers who were disconnected could still receive calls, but the experiment was discontinued because it was not possible to provide this scheme everywhere.

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<sup>7</sup> The amount of rental discount has remained constant over recent years, while rental charges have increased steeply as tariffs are rebalanced.

UK

*Affordability*

There is no formal position on affordability in the UK, but the regulator Oftel is considering two schemes which explicitly address the issue of affordability, either by increasing the degree of control or spreading the costs of telecoms expenditure. Oftel's view is that affordability is a "relative concept", in that as long as the cost of services falls relative to the retail price index, there is an increase in affordability of telephone services.

*Billing*

BT bills are issued every three months, although customers can request monthly billing. Oftel is encouraging the development of credit limits and 'call my bill' services.

*Deposits*

In July 1996 BT introduced a scheme whereby new customers can agree credit limits on their telephone expenditure for the first year of connection. A standard credit limit of £100 per quarter is available to all new customers, and those who agree to this limit will not be asked for deposits. Customers who require a higher credit limit are subject to a credit check. If the credit check is satisfactory a higher credit limit will be agreed; otherwise, the customer will be asked to pay a deposit.

*Special tariff schemes*

The provision of a low-user scheme is required by the licence held by BT. For every £0.01 by which usage charges incurred in any one quarter fall below £10.80 (ECU13.5), the customer receives a rebate of £0.01235. Thus the maximum rebate payable is £13.34 (ECU16.36) per quarter. Where call charges exceed £10.80 (ECU13.25) no rebate is payable and calls are charged at the normal rate.

Customers are eligible for the low-user scheme in any of the following situations:

- their call charges have been under £10.80 (ECU 13.25) for the last four quarters

- due to a change in circumstances they believe that their call charges will be lower than £10.80 (ECU 13.25) for the next three quarters
- they are a new customer and believe that their call charges will be less than £10.80 (ECU 13.25) for the next three quarters.

Customers who qualify under the first condition are invited to join the scheme on the first occasion they qualify. Customers with call charges of more than £15 (ECU18.4) on three successive bills are automatically removed from the scheme.

Terms of access for the disabled are described in the licences issued to BT. Textphones are available for use by deaf customers, and a relay service allows communication between a deaf person using a textphone and a hearing person using an ordinary telephone. The relay service is funded by BT and operated by the Royal National Institute for the Deaf. Customers with visual impairment are entitled to free directory enquiry calls. Licence holders have an obligation to advise the regulator on matters affecting disabled and the elderly.

Oftel is currently holding discussions with the industry on mechanisms for implementing tariff schemes which combine rental and usage charges.

*Debtors and  
disconnection*

Failure to pay a bill within three weeks results in a reminder bill being sent to the customer. Failure to pay within ten days of the reminder may lead to disconnection from the network. In some cases, BT will attempt to contact the customer by telephone before disconnection but does not guarantee to do so.

Customers who have been disconnected due to failure to pay their telephone bill are only reconnected once they have paid all arrears plus a reconnection charge.

Oftel believes that there are too many disconnections, and favours the use of soft disconnection (whereby disconnected users are still able to receive calls). The regulator does not have power to force

the introduction of such a policy but can propose licence amendments to do this if necessary.

### **2.1.3 Summary**

Table 2.1 summarises our discussion of the arrangements for universal service within the Member States of the EU, covering both the nature of universal service and affordability issues.

*TABLE 2.1: Summary of Universal Service Components in the EU*

**NBED wp 84**

*TABLE 2.1: Summary of Universal Service Components in the EU*

**NBED wp84**



## 2.2 UNIVERSAL SERVICE IN OTHER COUNTRIES

The development of universal service is an issue of global importance at the moment as telecoms markets liberalise. Given the level of debate on universal service world-wide, it is instructive to look at some examples of the implementation of universal service outside the EU. The experiences of five other countries were studied as part of this project:

- Hungary, Poland and the Czech Republic, all countries which are likely to join the EU in the short to medium term
- New Zealand, which has the most liberal telecoms market in the world
- the USA where a vigorous debate over universal service is currently being conducted, following the 1996 Telecommunications Act.

### 2.2.1 Central Europe

Interviews were undertaken with the regulatory agencies in Poland, the Czech Republic and Hungary. The legal basis for universal service is typically set out in the national Telecommunications Act and the detail of the policy is articulated in the contracts, concession agreements and/or licences which govern the actual delivery of telecoms services. The basic policy framework for universal service in these countries is broadly similar to that within the EU, with the focus of provision on voice telephony with geographically-averaged prices. The main issues connected with universal service in these countries relate to ensuring the rapid deployment of additional network resources in order to satisfy the substantial existing demand (evident in waiting lists of up to 100 months).

#### *Hungary*

The term 'universal service obligation' does not exist officially in Hungarian laws and decrees. The function is covered and regulated in 'concession contracts' between operators and the government. Lines are supplied either by MATAV (the principal operator), which has an exclusive licence to provide telephony services in 36 of the 51 'primary areas' into which the country was divided at the time of de-regulation in 1994, or by one of 12 local telephone operators (LTOs) which cover the remaining 15 'primary areas'. MATAV accounts for approximately 80% of lines in service.

The concession contracts each run for 25 years, during the first eight of which the concession holder enjoys exclusive rights to provide telephony services. MATAV is

required to provide long-distance and international service throughout the country and to LTOs at non-discriminatory rates. The LTOs are also required to provide universal telephone service in their areas. Operators do not receive any subsidy in return for providing universal telephone service, but they do receive exclusive rights.

MATAV's universal service obligations include the provision of a basic telephony line capable of making and receiving all types of calls; capable of fax and data transmission; and which has access to emergency services, operator services and directory enquiries (at local call rates). Itemised billing is also included as standard. However, single party (i.e. not shared) service is not provided as standard: shared lines are about 4% of lines (concentrated in Budapest) although the trend now is towards single party service, and no new shared lines are being offered. Shared service is tolerated by the regulator because it is currently the only way of extending telephone penetration in areas where the local switches are full. Touch tone dialling is only available on lines which are connected to a digital exchange. X25 data services are provided at uniform tariff throughout the country, but there is no requirement to make Internet access, leased lines, and ISDN available at uniform tariffs.

In addition to setting out the services to be provided to all subscribers, MATAV's concession contract contains clauses on non-discrimination (which effectively ensure uniform tariffs throughout the country), on accounting separation (designed to prevent cross-subsidies) and on prohibiting anti-competitive practices. The LTOs have the same basic contractual conditions as MATAV, but there are some variations in the conditions regarding extra services (usually services not related directly with basic telephony).

Subscribers can be charged a higher-than-standard price for a telephone line because of where they live, but fewer than 1% of prospective customers actually do have to pay "a little higher" than standard tariffs. They are all located in remote areas, mostly in the northern hilly region. The amount they have to pay is based on cost and is determined on a case-by-case basis. The Ministry is taking action to change this arrangement and hopes that by the start of 1997 tariffs will be uniform throughout the country. The normal tariff for the installation of a telephone line covers cabling right up to the termination point inside the subscriber's property.

Public telephones are provided by all licence holders throughout the country. The concession contracts state that public payphones must be provided in all municipalities with a population greater than 100.

The telecommunications fund law (Law No. 54 of 1995) created a telecoms fund, which is entitled to 10% of state revenues from privatisation of MATAV plus 70% of concession fees, fees for the use of radio frequencies, any fines levied by the regulator on operators who breach the conditions of their concession contracts and some international aid. According to the fund's rules, at least 90% of annual expenses must be used for development of the telecoms market. The government is currently considering proposals to change the means by which the fund is administered and the means by which funds are disbursed. The ministry recognises that universal service obligations mean some losses (net costs) for the operators and the telecoms fund could be used to reimburse operators

As far as the future is concerned, the Ministry has a watching brief. There are ongoing discussions within the Ministry as to whether to terminate MATAV's exclusive rights period earlier than the end of 2001. Any curtailment of MATAV's exclusivity period will involve some kind of bargain with MATAV. The Ministry is examining whether or not to initiate negotiations on this point.

In addition to internal discussions, it is watching EU universal service initiatives closely. Its thinking on the subject is still flexible and it is likely to follow whatever the European Union does. There are currently no proposals for broadband access for schools and hospitals, or the extension of services for the disabled (teletype relay service for hard of hearing, etc.).

An interesting development in the Hungarian telecoms market is the extensive use of wireless local loop access by a number of operators there. DECT and NMT-900 systems have been used to provide wireless local loop in different parts of Hungary. In 1995 Motorola won a contract to supply MATAV with a wireless local loop system capable of serving over 200 000 customers. This is currently being deployed and it is planned to have 700 000 customers in Budapest served by wireless local access by the end of 1997. This is a good example of using an appropriate technology to deliver coverage of telephone services in a rapid and cost effective manner.

Waiting time targets for customers are written into the concession contracts of both MATAV and the LTOs. These targets stipulate that, by the end of 1996, 90% of all orders for telephone lines must be dealt with within six months and 98% within 12 months. The sanctions for failing to meet these targets are written into all of the concession contracts, and takes the form of fines, followed by legal action by the regulator against the offending operator.

Deposits are not required for telephone service. Operators do not offer special tariffs to low users, pensioners or other types of customers who may have difficulty paying for telephone service. No state aid is provided to such groups. As far as the Ministry is aware, operators do not have any special offerings targeted at disabled people in order to improve their access to telecoms. However, MATAV does contribute to a 'social fund' which provides certain limited financial aid to people with sight or hearing problems on a case-by-case basis. Such help is not given automatically. All concession companies must provide phone booths with access for wheelchairs.

Customers who do not pay their telephone bill receive two warnings during the first month of non-payment. There is then a period of 15 days during which the subscriber can receive calls but not make calls. If the bill is not settled at the end of that period, the consumer is disconnected.

### *Poland*

Telephone service is available in all parts of Poland, although with waiting lists as long as 100 months, this universal coverage is largely theoretical in some areas. However, there is a legal basis to universal service in Article 2.1 of the Act on Communications (Posts and Telecommunications) of 23 November 1990, as amended on 12 June 1995 (Sections 14, 15 and 18). Universal service is not associated with the award of monopoly rights to operators; the only legal monopoly rights are for providing international public telephone and telex services (Article 16.1 of the Act). All other types of service require a licence from the Minister of Posts and Telecommunications (Article 12). The licences are granted through public tender procedure (Article 13); often more than one operator is licensed in an area. The principal operator (TPSA) is obliged to provide universal service in all parts of the country (under the Communications Act), and the private licensed operators are required to provide universal service in their licensed area, under conditions set out in their licences. Operators do not receive any subsidy for providing universal service.

Universal telephone service includes a basic telephone line capable of making and receiving calls, fax transmission, access to emergency services, access to directory enquiries, touch tone dialling, itemised billing and access to operator services, plus freephone and premium rate services. All subscribers pay the same price for telephone service regardless of where they live. The normal tariff covers installation of the telephone line up to a network termination point inside the property.

Universal service provision does not extend to X.25, leased line, Internet and ISDN services, although such services have to be provided at uniform prices across the area covered by each operator offering them. However, given that there are several suppliers of such services, there tends to be a range of prices available in the market.

Operators are not required to provide telephones in particular places, only to ensure that the number of public phones is 1% of the number of main telephone lines. This requirement is covered in Article 4.3 of the Decree of 8 February 1996.

Poland intends to put a new telecoms law in place in 1998 or 1999, which will incorporate changes to regulation covering universal service. As a preparatory step towards the new law, the Council of Ministers approved a discussion document "Telecommunications Development Policy" in May 1996. The most important statement as regards universal service in this document is that "New law and regulations should follow EU regulations and global changes (i.e. world telecommunications organisations)". In other words, in common with most Central European countries, Poland is going to wait and see what the EU does.

There is currently no legally-specified minimum set of quality standards which must be met for all telephone customers in the country, although one is under preparation. It will draw on studies underway in other countries, especially in the EU, as well as on TPSA's current (unpublished) quality targets.

Operators are not allowed to collect deposits until they have built 20% of the total number of lines which their area can support (this measure is part of the system of incentives put in place by the government to encourage operators to increase telephone penetration rapidly). TPSA operates a low user scheme in so much as the first ten units (equivalent to ECU0.57) per month are free. The monthly subscription fee is about ECU3.97. The State does not offer financial assistance to low users, with the exception of a 50% rebate on monthly subscriptions for World War II veterans.

TPSA offers special phones and special facilities in public telephones for the hearing impaired. There are no special arrangements for state aid to disabled people to improve their access to the telephone but disabled organisations offer some general financial aid.

Customers who fail to pay their bill will be disconnected from the network, after receiving reminders (up to three months).

### *Czech Republic*

The legal basis of the universal service policy is the 1992 telecoms law, which is itself an amendment of the earlier 1964 telecoms law. A new telecoms law, more comparable with EU policy, is expected to be passed during 1997. The operations of SPT (the national operator) and local telephony concession holders are governed by 'authorisations'. Until 1995, local telephony was provided under monopoly by SPT, with the exception of two small 'pilot project' areas where competition was allowed (Dattel in downtown Prague and Cable Plus in a limited part of Liberec). During 1995 the government issued local telephony authorisations to six further companies, covering 16 additional areas (at the time of writing these companies are only just beginning to operate). Authorisations oblige operators to offer service throughout their licensed area and to provide public payphones; they do not allow price discrimination. Operators in the Czech Republic do not receive any subsidy in return for providing universal service.

While universal service is a government aim, the waiting list (650 000 at the end of 1995) shows that it is far from being achieved. Universal service includes basic telephony, fax transmission capability, single party (i.e. not shared) service, and access to operator services, emergency services and directory enquiries. Itemised billing and touch tone dialling are not covered by universal service. Operators who provide X25 data, leased lines, or Internet access must offer the same tariffs throughout the country. However, different operators can use different tariffs.

Conditions regarding payphones are set out in the authorisations. A public payphone must be installed in every village with more than 2000 inhabitants and there must be one per 800 inhabitants. The Czech Telecommunications Office (CTO) monitors this, and believes it has been achieved.

The basic tariff covers installation up to and including the termination point inside the subscriber's property in all cases. Some subscribers used to pay higher prices than others for installation because of where they lived, but this was cancelled by mutual agreement between SPT and CTO in 1994.

It is expected that there will be some explicit provision regarding universal service in the 1997/8 telecoms law currently being prepared. There are currently no documents (not even internal working papers) to indicate what these provisions will be, but it is likely that they will be based on the trend set in the EU in the meantime.

An explicit minimum set of quality standards which must be met for all telephone customers is set out in the authorisations. It covers call completion, time to wait for dial tone, time to wait for ringing tone, time to wait for an operator, time to wait for directory enquiries, time to repair, time to repair public phones and time to repair a teletype terminal. Numerical targets are defined for all of these over the period 1995-2000.

Operators do not take deposits from their customers in respect of new telephone connections. All residential users receive the first ten units per month at CZK1.05 (ECU0.03); the price thereafter is CZK2.0 per unit (ECU0.06). Further price discounts are available to the disabled, to members of the Union of Fighters for Freedom (World War II veterans), and to people with low pensions.

Neither the State nor the operators make any special provision explicitly for disabled people in order to improve their access to the telephone, but some local authorities provide general benefits to disabled people. Special phones for the hearing impaired are available, but are not subsidised.

Customers who do not pay their bills are disconnected after the receipt of two warnings, with operators following a standard procedure. There is no 'soft' disconnection, largely because of the technical limitations of the network.

### **2.2.2 New Zealand**

New Zealand has no legislative controls regarding the provision of universal service or community service obligations. It is up to the individual service providers to make provision for these in their normal operations – there is also no positive benefit other than good customer relations if they meet any of these obligations

At the privatisation of Telecom Corporation of New Zealand (TCNZ), residential services pledges were incorporated into the legal agreements and Articles of Association of TCNZ:

- free local calling will remain a tariff option available to all residential customers
- the standard residential rental for a phone line will not rise faster than movements in the Consumer Price Index unless the profits of TCNZ's regional operating companies are unreasonably impaired
- phone line rentals for residential customers in rural areas will not be higher than in the cities, and the residential service will remain as widely available as it is at present.

Under its continued ownership of a 'golden share', the New Zealand government monitors TCNZ's adherence to these pledges.

Line rental is charged according to class of service. There are two classes of service, standard and non-standard. Standard rentals apply to most residential customers, and to business customers in areas which have local call charging. Non-standard line rental applies to older types of exchange, and to business customers in areas with modern exchanges but no local call charging. Non-standard is further divided into two types of service: individual and party-line.

The Consumer Guarantees Act obliges all companies to provide a service or product fit for its purpose with reasonable care and skill. Furthermore, TCNZ is bound by a voluntary agreement with the Ministry of Consumer Affairs to publish information every six months on residential quality of service (though it is obliged to meet any targets). TCNZ has a service guarantee, offering any residential customer a \$NZ50 (ECU 27.5) phone card or one month's line rental rebate if the customer has to wait more than 24 hours after the agreed repair time.

While TCNZ is not obliged by law or through its licence to offer low user schemes, there are a number of self-funded TCNZ initiatives to increase ease of access for the elderly, the disabled and low income customers:

- A special package ("60 Plus Phone Option") is available to customers aged 60 or more. This comprises a reduced monthly line rental and per minute charge for local calls. The telephone must be installed at the customer's permanent place of residence and only one package per customer is allowed. This package will be made available progressively throughout the country.
- TCNZ has set up a Special Needs Advisory Panel to investigate ways in which the disabled can be assisted. A range of rental phones is available, with features that can assist customers with special needs. For teletype users, there are special numbers for emergencies, faults and enquiries. For sight-impaired customers, there are toll-free numbers to access spoken versions of key TCNZ publications and product information.
- Under a TCNZ scheme called Budget Link, 20 000 low income households can receive toll-barred telephone services with half price rental and free connection.<sup>8</sup> The programme is administered by the New Zealand Federation of Family Budgeting

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<sup>8</sup> Toll-barred telephone services allow customers to receive incoming calls and make only local calls (which are free).



Services. Budget Link is available to Budget Service clients who agree to receive budget advice while they are on the service. It can be extended for up to 24 months on the recommendation of a customer's budget advisor. Those with an existing debt to TCNZ of up to NZ\$400 can qualify for Budget Link if they have an agreed repayment plan.

TCNZ bills residential customers monthly. If an account is not paid by the due date, the next bill shows "Account Overdue". If the account is not paid immediately, the customer is telephoned by an automated voice messaging system with a reminder. A week later, a second automated message is given with a disconnection warning. After another week the customer is contacted personally, and if the payment is not made within the next seven days the customer is disconnected (around two months after the date of the first bill). However, in the course of this procedure it is possible for the customer to come to an agreed repayment plan with TCNZ which will avoid disconnection.

### 2.2.3 USA

In the USA universal service was established under Section 1 of the 1934 Communications Act.<sup>9</sup> This section was the 'touchstone' for virtually all major universal service policy discussions throughout the world. The debate over universal service led to several initiatives, the most important of which are described below.

- In 1984 the Federal Communications Commission (FCC) adopted a plan which offers low-income households (satisfying a state-determined means test) a reduction in fixed charges for telephone service equal to the Federal subscriber line charge. For eligible households, the result of this scheme was a 50% reduction in total subscriber line charge (with the operator receiving compensation from federal funds).
- In 1985 the FCC adopted a broader 'Lifeline' assistance measure for low-income households, jointly funded by the Federal and state governments. This scheme has the potential to provide a telephone line free of rental charge where the state authorities are willing to participate fully (i.e. provide 50% of the line rental, which is then matched from federal funds). The scheme is means-tested on a regular basis to ensure that only those eligible individuals are benefiting from the scheme and is limited in availability to a single line for the principal residence.

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<sup>9</sup> An act to provide for the regulation of interstate and foreign communication by wire or radio and for other purposes, 19 June 1934.

- The third scheme, adopted by the FCC in April 1987, has two elements. The first, 'Link-up America', is a scheme designed to connect low-income households to the telephone network. Under this scheme, Federal assistance provides 50% of the connection charges, up to a maximum of \$30 (ECU23) in benefits. Under the second part of the scheme, Federal assistance is available to local exchange carriers to cover interest costs in those cases where a carrier offers a deferred connection charge payment plan, up to a value of \$200 (ECU154).

The passing of the 1996 Communications Act led to the amendment of Section 1 of the 1934 Act. Section 254 of the 1996 Act requires licensed telecommunications carriers "to make available, so far as possible, to all the people of the United States without discrimination on the basis of race, color, religion, national origin, or sex a rapid, efficient, Nation-wide, and world-wide wire and radio communication service with adequate facilities at reasonable charges".

The FCC Federal-State Joint Board on Universal Services has identified six key principles on which the debate over universal service should focus:

- quality and rates
- access to advanced services
- access in rural and high cost areas
- equitable and non-discriminatory contributions
- specific and predictable support mechanisms
- access to advanced telecoms services for schools, health care and libraries.

Consideration of universal service issues in the USA has been further refined by the terms of the 1996 Act, which describe two primary categories of service:

- a core group of services to be available to all citizens, with support for consumers on low incomes or in rural, insular and high-cost areas
- additional services, including advanced telecoms and information services, for providers of health care or educational services – a "targeted universal service" provision to ensure access to advanced services through public institutions. As yet there are no concrete proposals as to how this would be achieved, nor are there any estimates of how much it would cost.

As a result of making these categories explicit, it is now possible for regulators in the USA to think in terms of two levels of universal service, each appropriate to the needs of a specific user group. According to the FCC Joint Board: "As we interpret the 1996 Act,

our first responsibility is to identify what core group of services should be supported by Federal universal service mechanisms, to enable the first group of beneficiaries to purchase those services at just, reasonable, and affordable rates. As to the second category of services, advanced telecommunications services for schools, libraries and health care providers, section 254(c) (3) authorises the Commission ‘to designate a separate definition of universal service applicable only to public institutional telecommunications users’<sup>10</sup>.

In November 1996 the Joint Board of the Federal Communications Commission made recommendations on universal service in accordance with the 1996 Telecommunications Act. One recommendation it made was the introduction of the concept of ‘competitive neutrality’ meaning that “all providers of inter-state telecommunications services should make an equitable and non-discriminatory contribution to the preservation and advancement of universal service”. These contributions would constitute a universal service fund to be used to compensate operators who provide universal services.

The Joint Board also recommended “that eligible schools and libraries be able to purchase at a discount any telecommunications services, internal connections among classrooms, and access to the internet. The Joint Board recommends providing higher discounts for economically-disadvantaged schools and libraries and those entities located in high cost areas. Discounts are a minimum of 20% and range from 40%-90% for all but the least disadvantaged schools and libraries. Total expenditures for universal service support for schools and libraries is capped at \$2.25 billion per year, although any funds not disbursed in a given year may be carried forward and also disbursed”<sup>11</sup>.

In summary, in contrast to universal service measures adopted in the EU, policy in the USA has used means testing to target schemes to help low-income families remain on, or join, the network. Furthermore, the passing of the 1996 Act has allowed for two distinctly different policy objectives for different groups of users to be identified:

- continuation of schemes designed to help those on low incomes
- the creation of a separate definition of ‘universal service’ which is only applicable to public institutional telecoms users, namely, schools, libraries and health care providers, in order to provide access to new and advanced services.

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<sup>10</sup> FCC Federal-State Joint Board on Universal Services ‘Notice of Proposed Rulemaking and Order Establishing Joint Board’, CC Docket No. 96-45 8 March 1996. Source [http://www.fcc.gov/Bureaus/Common\\_Carrier/Notices/fcc96093.txt](http://www.fcc.gov/Bureaus/Common_Carrier/Notices/fcc96093.txt)

<sup>11</sup> Joint Board adopts universal service recommendations, FCC News Release, CC Docket 96-45

Thus the Act allows for universal service to be focused on network completion and the support of low-income households, while creating a policy mechanism to support the initial exploration of the value of advanced communications by certain user groups.

### 3/ Perspectives on Universal Service

In a study on the future of universal service in Europe, it would be ill-advised to seek input only from those directly involved in providing telecoms services. In order to ensure a balanced view on the development of universal service, it is equally important that views of the customers and other interest groups are taken into account. Therefore, in addition to soliciting the views of incumbent TOs and competitive operators (where they exist), Analysys interviewed consumer associations (representing residential customers) and telecoms user associations (representing business customers). The specific interests of those living in rural areas were sought by interviewing development agencies which have responsibility for peripheral regions. Finally, the interests of employees in the telecoms and other sectors as well as those concerned with broader social development were captured in interviews with representatives of trade unions, social organisations, and organisations representing the disabled. This section describes the views of the organisations interviewed, illustrating areas of consensus and divergence of opinions both within and between the groups approached. A complete list of organisations contacted is provided in Annex A.

#### 3.1 INCUMBENT TOs

In the course of this study Analysys interviewed a number of European and non-European incumbent TOs with respect to their views on universal service and its development. We focused on operators in countries with liberalised or fairly liberalised telecoms markets, as the need to determine an approach to universal service in competitive markets is more pressing in those countries. The organisations contacted were Ameritech, Telstra, TCNZ, BT, Telia, PTT Telecom, France Telecom, Telefónica and SPT. This section is also based

on responses to the Commission theme paper on universal service<sup>1</sup> and the Commission Green Paper on the Liberalisation of Telecommunications Infrastructure and Cable Television Networks.<sup>2</sup>

### **3.1.1 Scope of Universal Service**

All the incumbent TOs to which we spoke have an obligation to provide services of some kind in their countries, with an obligation to provide basic telephone services as a minimum (see Chapter 2). Some operators have further obligations placed on them relating to national security, defence of the state, and education, and even obligations regarding the TO's research and development spending. These obligations can impose considerable costs on a TO.

In their responses to the Commission's theme paper on universal service and the Green Paper on the liberalisation of infrastructure, incumbent TOs were unanimous in their support for universal service as a concept and for the attention it is receiving in the current climate of liberalisation. Most incumbent operators regard universal service as a means by which services are provided to the minority of customers who would not receive the service if it were provided in a totally free market, i.e. they have a 'market failure' vision of universal service.

### **3.1.2 Development of Universal Service**

The operator interviews and the submissions sent in response to the Commission papers are unanimous that universal service should concern itself with services which can be provided over existing PSTN infrastructure i.e. basic voice telephony, fax and low-speed data using modems. In fact, most incumbent TOs favour restricting the definition of universal service to basic voice telephony only. In many cases they explicitly stated that they would not wish to see universal service extended to basic rate ISDN. There is opposition from some TOs to including services such as free itemised billing and call barring, because provision of these services increases their costs. They maintain that these increased costs should be borne by the customers who enjoy the benefit of the service,

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<sup>1</sup> Theme Paper on Universal Service Issues, EC DG XIII (6 December 1995).

<sup>2</sup> Green Paper on the Liberalisation of Telecommunications Infrastructure and Cable Television Networks, COM(94)440 Final (25 October 1994).

rather than being spread across all customers. A number of incumbent TOs and ETNO (the European Telecommunications Network Operators association) assert that the provision of leased lines should not be part of a universal service obligation, and that leased line services should be made available on a fully commercial basis.

Some incumbent operators recognise that deposits are a deterrent to new customers. For example, Belgacom recently abandoned completely the practice of taking deposits from its customers and BT has also introduced its “Call Level” scheme designed to use credit limits to remove the requirement for deposits (discussed below). Other operators insist on deposits only from new customers or from customers who have a history of poor payment.

A number of initiatives exist or are planned by operators to assist customers who have difficulty controlling their debt from telephone usage:

- BT has recently introduced a £100 per quarter ceiling for the first year of service to new customers (its “Call Level” scheme). This will greatly reduce the need to charge deposits to customers to insure against bad debts. If a customer requires a credit limit greater than the standard, it is possible to lodge a deposit or undergo a credit check.
- other operators such as Telstra and Ameritech allow customers in their home market to opt for incoming calls only, and offer a cheaper subscription tariff with this service.
- Telia monitors customer expenditure on telephone services: if a customer’s spending increases dramatically, it will inform the customer between normal bills.

These schemes are a recognition by the incumbent operators that their own interests are not served by customer’s lack of control over their debt.

There was some support for the idea of the Commission providing guidance on the nature of universal service to promote a common understanding of universal service across the EU. However, there is no consensus among incumbent operators on the issue of the level at which universal service legislation should be handled:

- BT, for instance, supported the creating of a common understanding, and also supports a common funding mechanism. However, it said that the definition of affordability should be handled at a national level.
- Telia suggested that there is a danger of national governments using the implementation of universal service legislation to erect barriers to trade in telecoms services, either by creating complicated procedures or by insisting that companies wishing to enter a market take on an excessive universal service obligation. It should be the responsibility of the Commission to prevent this from happening. Telia also

believes that the universal service ought to be defined at a European level by the Commission and that governments should deal with funding it at a national level.

- Telecom Italia believes that there should be a set of mandatory services defined at a European level by the Commission which will be implemented by NRAs in the Member States.
- Telecom Finland believes that universal service should be entirely defined at a national level as there is sufficient diversity of circumstances between the Member States to make a European definition very difficult.

There is a strong division between incumbent operators on the position of funding for universal service. Operators in the more liberalised countries (UK, Sweden, Finland) favour a universal service fund. On the other hand more traditional incumbent operators (Deutsche Telekom, France Telecom, Telecom Italia) favour funding of universal service through a system of supplementary charges on interconnection. A few operators expressed no preference between these options. An overview of the various methods of funding universal service mentioned in this chapter is provided in Annex B.

There is unanimous hostility among incumbent telecoms operators to the idea of using universal service to drive the roll-out of particular technologies. It is contrary to the philosophy of universal service which is to provide to the few, services which have been adopted by the many. In addition, it involves government and regulators in picking winning technologies. Incumbent TOs argue that there is a grave danger that such a policy will introduce inefficiencies because technologies will be promoted which have not been required by the market.

In relation to this, BT raised the question of government-imposed restrictions on the technology used to deliver services. BT currently faces restrictions on the use of radio technology to deliver fixed telecoms services. In some of the more remote parts of the UK, using radio would be more efficient than using copper access. BT feels that it should have the right to use the most efficient technology to serve these areas if it has an obligation to cover them.<sup>3</sup>

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<sup>3</sup> Indeed, regulators have conceded this point and awarded BT a licence to operate radio based fixed network services in the Highlands and Islands area of Scotland. The authorities cited reducing the cost of providing universal service as part of their rationale. Restrictions on the use of radio apply to BT in the rest of the United Kingdom.



### **3.1.3 Tariffing Issues**

Geographical averaging of telephone tariffs occurs to a large extent in all EU countries, with the result that incumbent operators charge all customers more or less the same price for connection, rental and usage, regardless of the cost of providing that service. This means that some customers (typically in urban and sub-urban areas) pay a lot more (although how much more has not been quantified) for services than it costs the TO to provide those services, while customers living in remote rural areas (or urban areas where vandalism is a problem for TOs) pay less than it costs the TO to provide services.

There is widespread acceptance among operators that geographical averaging of prices for telecoms services across whole countries will become unsustainable when their national telecoms markets are liberalised. The end of geographical averaging of prices will bring the pricing of telecoms services more closely into line with ONP charging principles which require the prices charged for services to reflect the costs of providing them. However, there is some concern among incumbent operators that, for political reasons, governments will attempt to prolong geographical averaging following liberalisation while their competitors in urban areas will be free to pursue only their more lucrative customers.

## **3.2 COMPETITIVE OPERATORS**

Only in Denmark, Finland, Sweden and the UK can competitive operators currently provide basic voice services (the activity presently covered by universal service obligations). We therefore focused our interview programme on competitive operators in these countries. However, we also studied the responses to the theme paper on universal service and the comments on the Green Paper on infrastructure liberalisation which were made by organisations intending to become competitive providers of basic telephony services in other countries following liberalisation.

### **3.2.1 Scope of Universal Service**

There is broad agreement among the competitive operators included in this study that universal service is a laudable aim. However, several make the point that an issue requiring rapid clarification is identifying the objective of universal service more precisely. Is the objective of universal service the provision of a telephone in 100% of all households in the EU? (If this is the objective, it has not yet been met under monopoly

provision of telecoms services.) They believe that a 100% penetration target is futile as there will always be a small proportion of households which do not want a telephone.

It is the view of most of the competitive operators contacted that universal service is a mechanism to provide service to a small proportion of the population which the market fails to adequately provide with services. The household penetration of a service is a key criterion in determining whether or not a service should be included in universal service provision. However, a number of competitive operators argue that high penetration alone is not a sufficient reason to include a service in the definition of universal service; for example, microwave ovens, video recorders and motor vehicles all have high penetration in most European countries, but it would obviously be absurd to argue that they should be subject to some kind of universal service obligation. These operators feel that, in addition to high penetration, it should be demonstrable that inability to access a service is a source of disadvantage to the minority of customers who do not have the service.

The provision of universal service was generally accepted as a cost to be shared across the industry. There was some scepticism regarding the real size of the burden which the universal service obligation placed on incumbent operators. One competitive operator wondered what value was placed on an identifiable nationwide corporate presence by an incumbent operator which views its obligation to provide public pay-phones as a 'burden'. Another operator suggested a test to determine incumbents' attitudes to their universal service obligation – they should be asked to publish a list of services they would withdraw and customers they would disconnect if they were not obliged to offer them under universal service.

### **3.2.2 Development of Universal Service**

There was unanimity that universal service should apply only to basic telephone services as they are now delivered. Energis provided a list of the services that it regards as currently legitimately covered by universal service.

- basic telephony
- reasonable quality of service
- special tariffs for social purposes
- publication of information on special services
- directory services
- operator assistance
- public pay-phones

- access to emergency services
- assistance for the disabled.

There is considerable opposition among all the competitive operators to extending the definition of universal service even to include telephony services such as selective call barring and itemised billing. Competitive operators see these services as a means of distinguishing themselves from incumbent TOs and would prefer it if the incumbents were not obliged by the regulator to implement these services, thus eliminating one of the competitive operators' competitive advantages. There is unanimous opposition to extending universal service to include services such as ISDN or broadband until there is a proven disadvantage to a small minority who do not have such services.

With regard to funding, a number of competitive operators made the point that, in an ideal world, a matter of social policy such as universal service would be funded from general taxation. However they acknowledge that this is not an ideal world and that, for historical reasons, and because of current constraints on public spending, the cost of universal service will continue to be borne by the industry. There is thus support for the idea of a universal service fund which compensates the providers of universal services, and is funded by the industry, with contributions in proportion to the annual turnover of the operators. A number of operators expressed some concern that a universal service fund which is not tightly controlled would tend to grow each year, consuming an ever-increasing proportion of industry revenues: one operator suggested that the contributions should be capped at 1% of turnover for each organisation. There was some support for the franchising of universal service 'uneconomic areas'. Under a franchising scheme, the right to provide universal service in uneconomic areas could be auctioned to the organisation requiring the lowest subsidy from the universal service fund.

Mercury argued that if, following a detailed analysis, the cost of universal service is found to be very small as a proportion of revenues then there should be no bureaucratic procedure established to share the cost and it should be borne by the incumbent operator.

Competitive operators are strongly opposed to the use of universal service as a means of driving the roll-out of technology and services. They argue that the regulator or government has no business trying to pick winning technologies ahead of the market and that to do so will lead to economic inefficiency.

### 3.2.3 Tariffing Issues

All competitive operators interviewed and most of those who submitted papers to the Commission expressed support for the provision of special facilities for users with special needs as part of universal service. Provision of special equipment for users with speech or hearing impediments was deemed to be a particular priority. It was felt that the costs imposed by such provision would be only a small proportion of overall universal service funding.

Competitive operators agree that one of the reasons why a proportion of customers has failed to subscribe to telephone services is the generally unimaginative tariff packages offered by the incumbent TOs. For example, failure to offer tariff packages which reduce the burden of connection or rental by raising usage charges causes some customers to decide that they cannot afford telephone services. Operators including MFS maintain that one of the greatest contributions to increasing penetration will be the innovation stimulated by competition. The new services made available to customers as a result of fierce competition will not only be cheaper but, because of their diversity, of more value to the customer. This decrease in price combined with the increase in perceived value should cause more customers to take up telephone services.

This point of view is supported by evidence from the UK, where there has been competition in the provision of basic telephony since the mid 1980s. The UK Cable Communications Association says that upto 10% of the customers its members supply with telephony services have not previously had a telephone, an indication that lower connection and rental charges result in greater numbers of customers taking telephone services.

Some operators stated that the abolition of geographical averaging of tariffs would be a positive development, as geographical averaging was a mechanism which made telephone services too expensive for large numbers of less well off customers in areas that are not expensive to serve. Most operators felt that geographical averaging could not survive the introduction of a competitive market. MFS described geographical averaging in telecoms as an anomaly. People living in urban areas have higher costs than those living in remote areas for some things (e.g. accommodation) and lower costs for others (e.g. public transport). MFS's view is that there is an asymmetry: people living in rural areas where telecoms is expensive to provide are compensated by people living in areas where connection is less expensive, but no levy is charged on the people of rural areas to subsidise the high housing costs faced by residents in London, Paris, Milan and Frankfurt.

MFS asks why the people of those cities should subsidise provision of telecoms to people in rural areas.

### **3.3 CONSUMER ASSOCIATIONS**

In the course of the study Analysys interviewed a number of national consumer organisations in the EU (in Sweden, Finland, the UK, the Netherlands and Ireland); the Bureau Européen des Unions des Consommateurs (BEUC, the European organisation of consumer associations); and the Consumer Federation of America. In addition, Analysys has studied the position papers submitted by consumer associations to the Commission as comments on the theme paper on universal service and the Green Paper on infrastructure liberalisation.

#### **3.3.1 Scope of Universal Service**

Most of the consumer associations interviewed were of the opinion that universal service is an important issue for consumers as it ensures access on as wide a basis as possible to essential communications services. (One exception to this was the Finnish Consumer Association which does not regard universal service as a particularly important issue in Finland, reflecting the fact that most of the local telephone companies in Finland are co-operatives owned by their customers.) Consumer associations are also aware that it is consumers who will bear a large proportion of the costs arising from universal service provision.

Universal service is seen to be increasingly important as telecoms markets liberalise: consumer associations are concerned that residential customers could find their services suffer as operators compete for lucrative business customers. There is particular concern that incumbent operators will shift costs to residential consumers in order to compete more effectively for business customers; the business market will be the first to experience competition and incumbent operators will strive to minimise loss of market share. This concern recognises the fact that there can be a significant delay between the legislative opening of the market and the arrival of actual competition, particularly in the residential market.

All of the consumer association representatives interviewed which expressed a view agreed that universal service should apply only to residential customers, because competitive operators entering the market usually target business customers when they

enter the market. In the words of the representative of the Consumer Federation of America: "Businesses are the first to be taken care of by the market". In addition, business has basic requirements in excess of those for residential customers. For instance it is now very difficult to run a business without a fax machine, but most households exist quite happily without one.

Consumer organisations' complaints vary from country to country. In some countries the poor provision of digital lines is a problem which means that certain services (such as call forwarding, call waiting, etc.) are unavailable to customers. In others, basic telephony is subject to frequent interruption of service and in Greece, for instance, it has been the case that customers have had more than one telephone line to increase their chances of having a single working line at any one time.

Waiting lists did not prove to be an issue with the consumer associations we interviewed because connection delays in their countries are low and reflect reasonable administrative delay in processing applications. However, in other EU Member States, waiting lists can be sizeable: for example, 218 000 in Greece, 38 000 in Italy, 31 000 in Germany, 17 000 in Portugal, and 12 000 in Austria.<sup>4</sup> We are also aware that there are considerable problems in Central and Eastern Europe as the inadequate networks inherited from former regimes are upgraded.

An area of major concern to many of the consumer associations interviewed is the unlimited liability that telephone customers are exposed to in their relationships with telephone companies: "The fact that the customer is granted unlimited credit by the telephone operator is dangerous for both parties." Agreeing a fixed monthly limit to expenditure on telecoms services would give consumers the comfort of knowing that they cannot get into great debt through using the phone. In Sweden and Finland there is also concern about customers being charged for telephone calls made by third parties tapping into their telephone lines. Credit limits could at least limit the amount of debt in dispute in these cases, but this facility is not currently made available to most European telephone customers.

Call barring was also felt to be increasingly important with increasing availability and use of international and premium rate telephony. In Sweden, a customer must take explicit action to get access to certain categories of premium rate line. This reverses the problem

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<sup>4</sup> Analysys (1996), 1998, *A New Era for EU Telecoms Regulation*, Blackman, Dr C. and Denmead, M., Analysys Publications (1996).

of exposing customers to potential debt without their prior agreement. Innovative schemes such as control of access to premium rate services via personal identification number are another solution to this problem. Consumers should be able to define in detail the type of calls to which access is barred: it should be possible to bar access to sex lines while retaining access to information lines.

There is a strong consensus among consumer associations that universal service is a tool to help achieve increased social equality. All of the consumer associations interviewed agreed that a service should be classed as universal if “failure to access the service results in the exclusion of individuals from major parts of society.” This will normally only be the case when the penetration of that service is high, but some consumer associations were clear that high penetration in itself is not a valid reason for making a service universal.

Finally, it was suggested that a particular service should be included in universal service provision if it is cheaper than the service which it replaces. Some telephone companies in the USA actually charge their customers more for tone dialling than pulse dialling, despite the fact that tone dialling is cheaper for the telephone company to provide and maintain. Under these circumstances the Consumer Federation of America argues that tone dialling should become universal (and cheaper).

### **3.3.2 Development of Universal Service**

All the consumer associations included in this study support inclusion of basic voice telephony in universal service. In addition, BEUC supports inclusion of fax and modem access at a minimum speed in universal service, and the Dutch Consumenten Bond supports the inclusion of basic cable television services in universal service within the Netherlands because of the very high penetration of cable TV in Dutch Households (greater than 95%). There was no suggestion that cable TV be added to universal service elsewhere.

Consumer associations are aware that imposing costs on TOs may result in increased prices for consumers. They advocate close monitoring of the requirements of citizens to determine whether lack of access to specific services is causing inequality. Only if this is found to be the case should that service be considered for inclusion in a universal service obligation. The suggestion that ISDN could be made a universal service in order to make ISDN available in all parts of the European Union was not endorsed and there was unanimous opposition to the idea that universal service could be used as a driver to

technology roll-out: “Our organisation is not happy for consumers’ money to be used to develop technologies and services for which there is no apparent demand”

Several associations supported the idea of a minimum universal service level to be defined at an EU level. This would apply in all Member States, with additional services added at national levels where they are desired by the national regulator, in accordance with subsidiarity. However, some associations were adamant that all universal service issues should be handled at a national level.

The consumer associations interviewed were divided on the best way to fund universal service. A small majority felt that customers who cannot afford services should have the shortfall made up through contributions from the social welfare budget. Others favour a universal service fund either based on a system of supplementary charges on interconnection or ‘pay or play’. In this context, it is also interesting to note the proposal of the Consumer Federation of America for dealing with universal service in the USA. It proposes a basic level of universal service applied across the whole of the USA and funded by Federal resources, which could be supplemented by additional services required by individual states if thought desirable and which would be funded from state revenues.

### **3.3.3 Tariffing Issues**

Most consumer associations recognise that, in a competitive environment, it will be impossible to maintain geographic averaging of prices. They are, however, unhappy with the idea that uniform pricing will be removed completely and suggest that there should be some attempt to maintain some level of uniform pricing through subsidies from a universal service fund. They are particularly wary of the risk of TOs using the lack of competition in less profitable areas as an opportunity to actually penalise customers living in those areas, i.e. increasing prices in those areas beyond the level which reflects the true costs and using the extra revenue to subsidise services in areas where they do face competition.

Affordability of telecoms services – measured in terms of both how money is collected from customers and the amount that is charged for those services – is an issue which all consumer organisations regard as important. The current practice by some telecoms operators of charging deposits to insure against bad debts is a significant barrier to entry for customers of limited financial resources, especially when levied in addition to, and at the same time as, substantial connection charges. Current billing practices (billing in



arrears every two or three months) cause particular difficulties poor customers: monthly billing or the possibility of pre-payment for services would help to alleviate this problem.

Consumer associations also felt that changes to the typical pricing structure for telephone services are needed in order to avoid deterring low-volume users. The existence of a significant rental charge each month, even if no calls are made, means that the cost per call for customers who make few calls each period is relatively high. The mobile telephony sector has shown how it is possible to segment the market and offer tariff packages which are attractive to low volume users. Packages offering lower line rentals and higher call charges could be offered by TOs to reduce the barriers to low-volume users from taking a telephone service.

One of the organisations we spoke with (BUEC) felt that affordability of basic telephone services should be expressed in financial terms. It suggested that operators should be obliged to ensure that a minimum level of telephone service could be purchased for a specified proportion of average annual income or annual minimum wage in each Member State.

All but one of the consumer associations interviewed favoured soft disconnection of customers who have difficulty paying bills as an interim measure before full disconnection. Soft disconnection was generally defined as barring outgoing calls (except to emergency numbers and freephone numbers) but continuing to allow incoming calls. While there is considerable support for soft disconnection as a step in the procedures taken when customers fall into difficulties with their bills, the consumer associations also accept that full disconnection is appropriate for customers who consistently fail to pay their bills.

In a number of Member States special discounts exist for telephone customers with special needs, i.e. low users, the elderly and the disabled. All but one of the consumer associations interviewed in the course of this study supported the idea that discounts of this type should ideally be funded by general taxation and allocated through social welfare spending. However, they also accepted that governments are reluctant to be seen to increase taxation and so it is unlikely that such discounts will be funded in this way. In recognition of these political constraints, most of the consumer associations accept that these discounts should be taken from whichever form of funding mechanism is used for universal service.

Access to the Information Society for the homeless is not an issue which the consumer associations interviewed had considered in any depth. There was some support for the idea of giving the homeless free voice-mail boxes as a means of allowing them to be

called, thus assisting them in their search for work. For example, Mercury Communications offers free voice mail services to the homeless in the UK. However, one organisation candidly admitted that the homeless do not feature in the membership of consumer associations which tend to be dominated by the better off in society, so not a great deal of consideration is given to their situation.

### **3.4 USER ASSOCIATIONS**

User associations represent large corporate telecoms users. They have been supportive of the introduction of competition and have also been one of the most active groups participating in the whole debate on universal service. User associations do not stand to gain a great deal from universal service as their members are very attractive potential customers for operators and so will be offered services in most locations at keen prices. However, costs imposed on the whole telecoms sector will be passed on to the customers of the industry which include user association members.

Three user associations were interviewed: AFUTT in France, Beltug-TMAB in Belgium and BTG in the Netherlands. We received position papers from the UK TMA and INTUG.

#### **3.4.1 Scope of Universal Service**

There is a spectrum of opinion across the user associations we contacted. The BTG regards universal service as a non-issue: "Universal service was an important issue for us when there were waiting lists, but now that the waiting lists have been eliminated we find that there is no requirement for universal service as it already exists. It is a pity that it is only now that telecoms operators are beginning to regard universal service as an important issue." However, the AFUTT takes the view that there is no public service without universal service, regardless of whether France Telecom is publicly or privately owned.

Users organisations are concerned that the cost of universal service should not be too high, because any additional costs will have to be met (in part) by their members. In its position paper, the UK TMA draws a clear distinction between universal service and universal access. It argues that it is likely that many service providers will not be access providers, but that their services should be made available to customers on the same basis as the services provided by the access provider.

In its position paper on universal service INTUG describes the ultimate goal of universal service as a affordable access to sufficient services for all human beings, enterprises and even pieces of equipment, to play a full part in personal, social and commercial life within the global society. INTUG goes on to point out that the untelephoned can be divided into three categories:

- those who actively do not wish to have telecoms services
- those who could afford to have the service but choose to spend their available resources on other things
- those who wish to have the service, but either cannot afford to have it, no matter how much they deny themselves other things, or are prevented from using the standard service for reasons of disability.

INTUG maintains that universal service should be targeted at the needs of the third group described. The UK TMA has a similar position, although it concedes that it is difficult in practice to distinguish the people who will not pay for a service from those who cannot pay. However, there is a general recognition by the user associations that there is a portion of society which has a genuine social need for telephone services but who cannot afford it. The requirements of this group should be met through some form of assistance.

Most of the user associations interviewed see universal service as an issue for residential customers only. This stems from the view that universal service is a concept which was developed to meet social needs. Provision of basic telephone services to businesses should certainly be mandatory, but businesses can pass their costs on to customers and so affordability of these services to businesses is not a matter of concern in a competitive market. The only organisation which disagreed with this view was the AFUTT, which pointed out that the distinction between business and residential customers is becoming blurred.

### **3.4.2 Development of Universal Service**

All but one of the user associations contacted supported the position that any future definition of universal service should include basic voice telephony. There is considerable reluctance to the inclusion of additional services, although Beltug-TMAB supported the addition of call barring and itemised billing.

The TMA maintains that universal service should be applied differently to different categories of customer: those in social need, the average domestic user, public access and

the business user. Basic voice services should be universal services for all categories for all categories. Beyond basic telephony, a combination of the market and social need must determine the level of universal service in each category.

Both the AFUTT and the TMA support the idea that the services included in universal service should be subject to regular review. The TMA recommends that the review should take place every three years, and AFUTT says that a review every five years is not frequent enough.

The opinion of the user associations contacted was that universal service should be regulated at a number of levels. According to AFUTT, subsidiarity should prevail and universal service issues should be dealt with at a national level where harmonisation is not involved. The TMA agrees that it would be a mistake to draw up detailed regulations on universal service on a European level, but feels that it would be of great benefit for some common definitions and targets to be set at a European level which would lead to greater equalisation of telephony penetration rates and service levels in Member States. Only Beltug-TMAB take the view that as universal service should be dealt with as much as possible at the European level.

### **3.4.3 Tariffing Issues**

All of the user associations contacted agreed that geographic averaging of telecoms tariffs will not be possible in a competitive telecoms market. According to INTUG, full cost orientation will ultimately undermine the principle of geographical averaging of tariffs within individual countries. INTUG acknowledges the political desire to see geographical averaging continue but argues that it may constrain the growth of telephony penetration in the market by keeping prices artificially high for some customers.

BTG also takes the view that geographical averaging will disappear but considers that the proportion of customers with access to telecoms at a reasonable price will be maintained. AFUTT forecasts that a multitude of tariffs will be available to telecoms customers which will vary according to geographic location, level of telecoms expenditure and the type of customer. This will enable innovative tariff packages to be targeted at specific groups. Beltug-TMAB believes that competition will result in a wider disparity between the prices paid by customers for services, and that in the short term, there is a risk that some residential customers will be disadvantaged.

Most of user associations interviewed were very hostile to the idea that universal service could be used as a means of accelerating the roll out of new services and technologies. BTG considers that such a course would impose extra costs on the industry and would discourage competition by increasing the entry cost to new entrants. The TMA feels that imposing extra costs on the industry will favour incumbent operators who will be better able to absorb those costs than competitive operators. However, the AFUTT favoured the use of universal service to encourage the roll-out of technology and services essential to the creation of the Information Society.

### **3.5 DEVELOPMENT AGENCIES AND BANKS**

Analysys interviewed a number of development agencies and banks regarding universal service. We concentrated on development agencies which operate in peripheral areas of the EU in Member States with competitive telecoms markets: Highlands and Islands Enterprise and the Welsh Development Agency in the UK; Almi Foretagspartner in Sweden; Kemi-Tornio Regional Development Agency in Finland; and Udarás na Gaeltachta, a development agency concerned with Irish speaking areas in Ireland. Czech Invest, the only development agency in the Czech Republic, declined to participate because it is not a policy making body. The EBRD and the EIB also declined, as they do not have a policy on universal service.

#### **3.5.1 Scope of Universal Service**

Universal service is a very important issue for the development agencies covering the peripheral regions of the European Union. Even in countries with liberalised markets, there is not much actual competition in these regions, particularly for access. Development agencies feel that, without universal service and particularly the quality of service requirements imposed, carrying out business would be considerably more difficult in areas which already suffer many other disadvantages because of distance from major urban centres: "We cannot have companies here without universal service."

The development organisations spoken to expressed broad satisfaction with the telephone service receive in their areas currently. However, there is a higher than average incidence of older exchanges in these areas and this can cause some problems for accessing advanced services. In most areas ISDN is either impossible to get or the connection charge is such as to deter most potential subscribers. The exception is Ireland where Telecom Eireann has provided ISDN even on the offshore islands when it has been

requested. Another cause of dissatisfaction is that local call areas are sometimes determined by geographical area, rather than by the number of people that can be reached for the price of a local call. In the UK, for instance, a person living in London can reach approximately 10 million people for the price of a local call, whereas only tens of thousands of people are accessible for the price of a local call in remote parts of Wales and Scotland.

Unlike most of the other categories of interviewee, all of the development agencies interviewed supported the idea that universal service covers business as well as residential customers: "They are all connected to the same exchange". A number of alternative definitions were suggested:

- Scottish Enterprise wanted to expand the definition still further: it felt that a service should be a universal service when it becomes a normal tool of business. By this definition, voice telephony, and fax should be regarded as universal services now; access to the Internet is likely to meet this criterion in the near future. Scottish Enterprise thinks that it will be some years before ISDN will qualify.
- The Welsh Development Agency stressed the principle that, if a service is important for overcoming peripherality, it should become a universal service. Videoconferencing can be used in many ways to reduce the isolation of remote areas, for example in agriculture (access to price information and remote auctions), and health (using videoconferencing to consult with specialists in other hospitals). Therefore ISDN should become a universal service, as it allows videoconferencing.
- The Swedish agency's requirement was straightforward: when a service is in widespread use in cities, then it should be made universal. Thus, a service such as ISDN, which is available in major cities and used by businesses there, should be made available throughout the country.

### **3.5.2 Development of Universal Service**

All of the development agencies interviewed felt that lack of access to ISDN is a problem for businesses in their areas, and wish ISDN to be added to universal service for business customers, although Scottish Enterprise conceded that it may not be justifiable at the moment. The Welsh Development Agency favours government 'pump priming' to give services enough momentum to be successful on a commercial basis, although it agrees for the need to first require evidence of user demand. Other services which received some support were itemised billing, access to digital services operating on SS7, and CLASS services. It was generally felt that lack of access to these services at a reasonable price

was disadvantaging existing businesses in their areas and making it more difficult to attract new businesses.

### **3.5.3 Tariffing Issues**

Scottish Enterprise and Udarás na Gaeltachta strongly oppose the removal of geographic averaging, believing that it will lead to peripheral regions being even further disadvantaged. The Welsh Development Agency sees that the end of geographical averaging as inevitable, but wants it to continue until the arrival of real competition in all areas, and believes that, even then, the price for telecoms services should be regulated, with the price in any part of the country not allowed to exceed a specified amount. The Swedish agency sees geographical averaging disappearing, with the peripheral regions being disadvantaged in the short term. However, it believes competition and technical innovation will see that disadvantage eroded in the longer term, and all regions will have similar prices for similar services.

## **3.6 TRADE UNIONS AND SOCIAL ORGANISATIONS**

In the course of this study we contacted both trade unions and groups concerned with social issues. The trade unions interviewed fall into three categories:

- those with a direct or indirect interest in the telecoms sector: Deutsche Postgewerkschaft, Communication Workers Union, IPTT (Internationale du Personnel des Postes, Télégraphes et Téléphones), Eurofedop (European Federation of Public Service Employees)
- those with a direct or indirect interest in the emerging Information Society: International Committee of Entertainment and Media Unions, International Federation of Journalists
- those representing more general trades union groups: ETUC (European Trades Union Confederation).

In addition, we spoke with the Foundation Charles Leopold Mayer pour le Progrès de l'Homme which is concerned with the development of social policy.

It is important to note that, in discussing the future of universal service in Europe, trade unions and social organisations tend to take a long view, looking towards the Information Society of the future. They are clearly concerned with how liberalisation of the telecoms

market will affect their members, but also with wider consideration of the nature of work in the future and the impact on the rights and benefits of workers in general as a result of changes brought about by widespread deployment of communications technologies.

### **3.6.1 Scope of Universal Service**

The positions expressed by most of the organisations we interviewed related to the role of universal service when the Information Society is a reality. There was therefore a considerable amount of support for the inclusion of broadband services. The CSC maintains that, in an Information Society, universal service should be as comprehensive as possible. The ICEMU maintains that all individuals must have access to broadband services to obtain employment, enjoy leisure, receive information and exercise citizenship. The Deutsche Postgewerkschaft maintains that access to telecoms services is becoming a fundamental right for citizens comparable with access to schools and universities. It believes that a true Information Society cannot be based on just a minimum offering for the poor and so universal service must cover not only the basic telecommunications network, but also access to, and use of, ISDN.

One of the unions interviewed (SUD) took a more cautious approach to the development of universal service. It believes that it is necessary to prioritise the requirements of citizens, and that the top priority is to guarantee access to basic telephone services for all inhabitants of Europe as well as making specific regulations to guarantee those services in the face of social exclusion and poverty.

### **3.6.2 Development of Universal Service**

A number of unions raised the issue of access to information being essential for empowerment of European citizens in the future. It is clear that, in the short term, it would be prohibitively expensive to provide every citizen with all the equipment required for accessing the Internet or similar services and so it is necessary to make information available to citizens via public access points in libraries or other public buildings. Eurofedop favours the mass business approach to deploying technologies in the market at an affordable price. Here the government chooses a technology and creates the circumstances for its widespread deployment in society rather than waiting for the market to deliver widespread technology deployment.



However, it is not sufficient to provide the equipment for access to information. The vast majority of people in the European Union are not computer literate. Although the proportion of computer literate people is growing all the time, it will be many years before the majority of citizens will be comfortable using computers. Therefore it will be necessary for a basic training in computer literacy to be available to those who wish to learn.

The anticipated growth of teleworking is a cause of some concern for trade unions. Considerable attention has been devoted to the potential pitfalls faced by teleworkers in terms of coping with the stresses of conventional work without the social benefits, and bearing costs such as office space, power, and heating which conventional employees do not have to bear. However, the issue of how the blurring of the boundary between business and residential usage of telecoms services should affect the definition of universal service was not addressed.

All but one of the unions spoken to favoured funding universal service from a universal service fund contributed to by all of the players in the telecoms sector. SUD believes that the existence of a monopoly incumbent TO is the best way to ensure universal service. At the other extreme, Eurofedop took the position that, while a universal service fund was the best method in the short to medium term, if real competition in telecoms becomes widespread in Europe, there will be no need for universal service and its funding ceases to be an issue.

### **3.6.3 Tariffing Issues**

There is support for the continuation of geographic averaging beyond the introduction of competition in 1998. It is regarded as being too important a mechanism for social equity to be discontinued, despite the difficulties in implementing it in a competitive market. Far from accepting a diminution of geographical averaging at a national level, SUD maintains that there should be some form of geographic averaging across the EU. It suggests that the EU should assume tariff control powers with a view to harmonising tariffs across all Member States. The ICEMU broadens the issue even further: it believes that the arrival of the Information Society should be seen as an opportunity to reduce the inequality of communications capability between countries: "Telecommunications penetration and network development in different countries already reflects the massive inequalities in wealth and power in the international community. The advent of broadband networks must not widen these already huge divisions."

### **3.7 ORGANISATIONS REPRESENTING THE DISABLED**

In the course of the study we spoke to two organisations concerned with universal service from the perspective of the disabled customer. These were COST 219, an organisation concerned with all disabilities and how they affect the lives of disabled people, and a UK body called Telecommunications Action Group which is concerned with access to telecoms services for people with hearing disabilities.

#### **3.7.1 Scope of Universal Service**

According to the organisations interviewed, universal service definition must incorporate considerations of access to telecoms services for people with disabilities. Most commentators discuss universal service in the context of access for people in remote locations or access to services for people of limited financial means. However, the organisations we contacted argue that the issue of access for people with disabilities is just as fundamental as access for people in remote locations.

The difficulty which people with disabilities encounter in accessing telecoms services obviously varies depending on the nature of the disability. Special equipment is required to enable people with hearing and speech difficulties to communicate over the telephone network. However, disabled people are affected in a range of different ways, many of which make telephone services difficult, impossible or prohibitively expensive for them to use. The organisations interviewed believe that universal service should strive to eliminate these difficulties and make telecoms services affordable for people with disabilities.

#### **3.7.2 Development of Universal Service**

Table 3.1 illustrates the wide range of problems which disabled people face in using the telephone, together with a variety of possible solutions.

TABLE 3.1: *Some of the Problems Faced by the Disabled in Using the Telephone Service*

<i>Disability</i>	<i>Problem</i>	<i>Possible solution</i>
Hearing difficulty	Cannot hear speech  Cannot hear telephone ringing  Access to public phones	Teletype service with relay or inductive couplers which interact with hearing aid  Flashing light attached to ringer  Ensure that a proportion of public telephones are text phones
Sight difficulty	Dialling  Use of paper directories	'Pip' on the 5 key on push button phones  Access to telephone enquiry service
Hearing and sight difficulty	Cannot hear speech or read teletype	Teletype Braille attachment
Motor difficulty	Access to public telephones  Disconnection of call before dialling is complete, due to time-out	Consideration given to access for wheelchairs in siting and housing public telephones  Extend time-outs for some customers
Cognitive disability	Confusion when faced with automated systems  Confusion with complicated telephones	Make human assistance more available  Ensure that simple telephone handsets are available

Some of these solutions are expensive to implement; for example, a teletype service with relay requires is expensive in terms of the equipment required and the human resources needed to operate the relay service. Both of the organisations which we interviewed

emphasised that the needs of the disabled are far better served and at much lower cost if the solutions are incorporated at the initial design phase of equipment and services rather than 'bolted on' as an afterthought. An example of such a solution is the 'pip' on the '5' key of push button telephone dials which allows people with sight difficulties to identify the keys for dialling.

There was agreement that a set of minimum standards should be defined for network facilities for the disabled, and that suitable terminal equipment should be available. In particular, the interviewees believed that specialist terminal equipment should be available to the disabled on a rental basis in the same way that standard handsets are. As such terminal equipment is usually more than ten times the price of ordinary telephone equipment a rental arrangement could reduce the barrier of high initial equipment costs.

### **3.7.3 Tariffing Issues**

It is not the aim of organisations which represent the disabled to seek special favours for disabled people. They maintain that many of the requests they make on behalf of their members are designed simply to bring access to telephone services for the disabled up to the level enjoyed by other customers. Where small additional costs are imposed on the disabled person then there is not a great issue of access to consider. However, additional costs can mount up very quickly due to a combination of the need for special equipment and the longer usage time required for communication. Just as people who incur very high additional telecoms costs due to their geographical location argue that funding should be available to offset some of the disadvantage they face, organisations which represent the disabled maintain that funding should be available for people whose disability means they incur very high additional costs. One way of providing this funding would be via a universal service fund.

## **3.8 CONCLUSIONS**

A number of strong themes have emerged from our discussions with organisations which have an interest in the development of universal service. The most important of these are as follows:

- There is a broad consensus that access to telecoms services is an important issue and an acknowledgement that it is becoming increasingly important as the Information

Society emerges. This consensus extends to supporting the use of universal service obligations as a means of reducing the risk of social exclusion.

- Universal service is seen as an issue for residential customers only. Business customers do not need the protection of universal service.
- With the exception of development agencies we found almost no support for extending universal service to cover more than basic telephony services. There was a divergence of opinion between operators and consumer associations about what constitutes a basic service. Consumer associations support the inclusion of itemised billing and call barring as they provide basic information on and control over telecoms expenditure. Some operators are concerned about the cost of including such services.
- Most of the organisations interviewed were hostile to the idea of using universal service to roll out new technology rather than to complete established networks.
- There was acknowledgement from most of the interviewees that geographical averaging of prices is unsustainable in a competitive telecoms market.
- A lack of creativity and flexibility in the tariffing of fixed telephone services is seen as a significant impediment to the take-up of telephone services. The frequency of billing is also an issue for some customers.
- Access to telecoms for disabled customers is directly comparable with access for customers in remote geographical locations.

## 4/ Practices in Other Sectors

Telephone services have traditionally been grouped with other utilities such as gas, water and electricity, which provide essential services for the population and require extensive networks deliver their services. In the past these characteristics were considered powerful arguments for the creation of 'natural' monopolies which delivered services to large sections of the population, if not the population as a whole. (It was not always the case that a single organisation provided these services throughout a country, but a customer would generally be able to get utility services from only one supplier in a given area.)

In the course of this study we spoke to providers of utilities and regulators in the water, electricity and gas sectors to find out how they deal with obligations to provide universal service to their customers. We concentrated on countries where liberalisation has resulted in utility providers which are privately owned and already face, or will face, competition from other suppliers. Interviews were conducted with the regulators of water, gas and electricity sectors in the UK, with Lyonnaise des Eaux (French water company), and with the providers of gas, water and postal services in Australia and the postal service in New Zealand. The inclusion of interviews in Australia and New Zealand allowed the study to consider in detail the problems of providing universal service in remote and rural areas.

This chapter describes the nature of the obligations placed on operators in these other sectors and draws conclusions as to the applicability in the telecoms sector of some of the issues raised.

### **4.1 THE ELECTRICITY INDUSTRY IN THE UK**

The electricity industry in the UK is entirely held in private hands. Generation of electricity is carried out by a number of competing companies including National Power, Powergen, and British Energy. National distribution is carried out by the National Grid

Company. Local distribution is provided by 14 regional electricity companies which currently do not compete for residential customers. All of these companies are successor companies to the nationalised electricity companies and hold Public Electricity Supply (PES) licences. Another type of licence (Second Tier Supply licence) is available to:

- generators supplying direct to customers
- regional electricity companies wishing to supply outside their areas.
- resellers of electricity from other sources.

Currently, only large business customers have a choice as to where they purchase their electricity. However, this will change in 1998 when both residential and business customers will be able to seek supply from any electricity generator. National and local distribution of electricity will remain a monopoly for residential customers for the foreseeable future, although functions such as meter reading and connection are likely to be separated and made subject to competition.

In 1998, when generators of electricity are free to compete for domestic customers, then they will take on a universal service obligation to provide services to all domestic customers. However they can refuse to supply some domestic customers for “reasons beyond their control”. Regional electricity companies cannot refuse to provide service.

Electricity supplies are connected to an electricity meter which must by law be housed in a building. Connection incurs a standard charge except when the distance to the building is unusually long: then the electricity company is allowed to recover its costs from the customer. Electricity prices vary from area to area in the UK, but within a single area prices must be in accordance with a regulated tariff which must be published. This tariff includes different charges for electricity depending on whether or not access to electricity is via prepayment meter.

When customers of electricity companies have difficulties paying their bills, procedures agreed by the regulator state that the next step is for the customer and the electricity company to discuss how debts can be cleared. One of the standard approaches to dealing with customers who are in arrears is to offer them a pre-paid electricity meter which eliminates the danger of future debts.

Prepaid meters are smartcard-controlled; the smartcard can have credits loaded onto it in post offices, electricity company shops and other outlets. The system is designed so that, if the credits run out in the night or at the weekend, the subscriber is allowed to accumulate a small debt in order that electricity supplies are not disconnected at a time

when it is not possible to restore credits on the card. This debt is recouped then next time the card is loaded with credits. Furthermore, when a customer has accumulated debts, the smart card can be calibrated to charge a higher amount of money per unit of electricity than for normal prepayment. The extra payment is put towards the elimination of the debt.

Since the introduction of the code of practice for domestic consumers in 1991, the rate of disconnection of electricity customers in the UK has fallen from nearly 13 000 per annum in 1992/3 to 1083 in 1994/5, a fall of more than 90%. Table 4.1 shows the disconnection rate per region over the three years. Currently in the United Kingdom more than 12% of electricity customers use prepaid meters.

TABLE 4.1: Residential Customer Electricity Disconnections in the UK, 1991-1996 [Source: OFFER]<sup>1</sup>

Company	1991/2	1992/3	1993/4	1994/5	1995/6	% Reduction
Eastern	1589	882	508	229	238	85
East Midlands	1414	390	311	153	56	96
London	8019	526	139	0	0	100
Manweb	1122	350	23	27	30	97
Midlands	5033	963	211	8	7	99
Northern	3364	2431	184	39	54	98
NORWEB	218	468	344	270	101	54
SEEBOARD	2521	1123	101	23	0	100
Southern	5276	1338	185	128	73	99
SWALEC	563	207	54	35	24	96
South Western	2717	834	66	94	67	98
Yorkshire	1839	1804	397	36	4	99
Hydro Electric	1570	471	227	14	10	99
Scottish Power	5773	936	67	27	10	99
<b>TOTAL</b>	<b>41018</b>	<b>12723</b>	<b>2817</b>	<b>1083</b>	<b>674</b>	<b>98</b>

<sup>1</sup> Report on Customer Services 1994/95, Office of Electricity Regulation (OFFER). Reproduced with the kind permission of OFFER.



OFFER monitors quality of service in the UK electricity industry. Electricity companies are required to meet guaranteed standards of performance, and results are published annually. There is a voluntary compensation scheme for performance which fails to meet the specified targets.

## **4.2 THE WATER INDUSTRY IN THE UK**

The water industry in England and Wales is in private hands, with 32 water companies operating monopolies for residential supply in their regions. Unlike the electricity and gas industries, there is no national water distribution network. Water supply in Scotland and Northern Ireland is still in public ownership. Under Section 51 of the Water Industry Act, water companies are obliged to supply water to customers in their areas if requested by the owner of the property.

Residential customers for water are billed in three ways.

- Un-metered customers are billed according to the rateable valuation of their property and pay a fixed charge for water and sewerage services. Additional fixed charges are made for using devices such as sprinklers which use a lot of water.
- Metered customers pay a standard charge which covers only the cost of meter reading and billing. They then pay a charge for each cubic metre of water used in a billing period. The charges per cubic metre currently varies between £0.41 and £1.06 depending on the region of the country.
- The budget payment scheme is a method for prepayment of water bills. A smartcard unit is installed in the customer's home and the customer is given a smart card which can be charged with credits, allowing the customer to use the water service normally for a given period of time. Credits are transferred from the smartcard to the unit when the card is inserted in the box. An emergency credit period is programmed into the card so that there is a period between the expiry of the credits and a shut off of the water supply. If the unit runs out of credits, the water supply can be immediately restored by inserting a charged card. As with the electricity smartcard scheme, the card can be calibrated to a higher tariff to repay an outstanding debt.

The introduction of the budget scheme and the code of practice for disconnection of customers has had a dramatic effect on the number of disconnections in England and

Wales. Table 4.2 shows the number of disconnections since the financial year 1991/2 and how they have fallen since the introduction of the code of practice in 1992.

Ofwat monitors quality of service in the UK water industry and ensures that companies meet their legally-guaranteed standards. Customers are entitled to compensation if these standards are not met. Quality of service measures include customer service aspects (e.g. punctuality), time to repair faults, and water quality.

TABLE 4.2: Residential Customer Water Disconnections in England and Wales, 1991-1996 [Source: OFWAT]<sup>2</sup>

Company	91/92	92/93	93/94	94/95	95/96	% Reduction
Anglian	1306	214	978	403	204	84
Bournemouth	342	72	95	42	49	86
Bristol	111	89	149	225	177	(60)
Cambridge	323	303	304	264	32	90
Chester	13	106	49	36	20	(54)
Cholderton	0	0	0	0	0	0
Dwr Cymru	2938	2316	527	84	81	97
East Surrey	95	123	86	34	46	52
Essex & Suffolk	197	272	270	345	166	16
Folkestone	32	132	179	44	42	(31)
Hartlepool	94	37	10	135	24	74
Mid Kent	715	478	524	220	281	61
Mid Southern	376	820	900	149	27	93
North East	210	8	0	58	112	47
North Surrey	11	420	188	335	145	(1200)
North West	2074	495	363	451	490	76
Northumbrian	705	709	363	183	37	95
Portsmouth	23	674	912	1514	512	(2100)
Severn Trent	1303	1222	590	553	462	65
South East	251	358	227	64	0	100
South Staffs	3494	1878	698	302	254	93
South West	381	300	149	274	128	66
Southern	2043	3158	1600	1330	360	82
Sutton	70	88	93	103	72	(3)
T'ring Hundred	59	137	98	103	50	15
Thames	61	852	1195	1130	1075	(1600)
Three Valleys	1471	1362	621	796	504	66

<sup>2</sup> Office of Water Services (OFWAT) news release, 7 May 1996. Reproduced with the kind permission of OFWAT.

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Wessex	39	154	2	7	0	100
Wrexham	0	26	30	77	20	-
York	161	112	103	86	11	93
Yorkshire	2384	1721	1149	700	382	84
<b>TOTAL</b>	<b>21282</b>	<b>18636</b>	<b>12452</b>	<b>10047</b>	<b>5826</b>	<b>73</b>

Note: The water regulator does not regard water supply interruption by smartcard units as disconnection of the customer from the water supply.

### **4.3 THE GAS INDUSTRY IN THE UK**

British Gas was privatised in 1986 and has operated as a single company since then. However, the company is now proposing to separate into two parts: a gas supply company (equivalent to a generator in the electricity industry) and a distribution company. The distribution company will retain a monopoly over the distribution of gas in the UK for the foreseeable future.

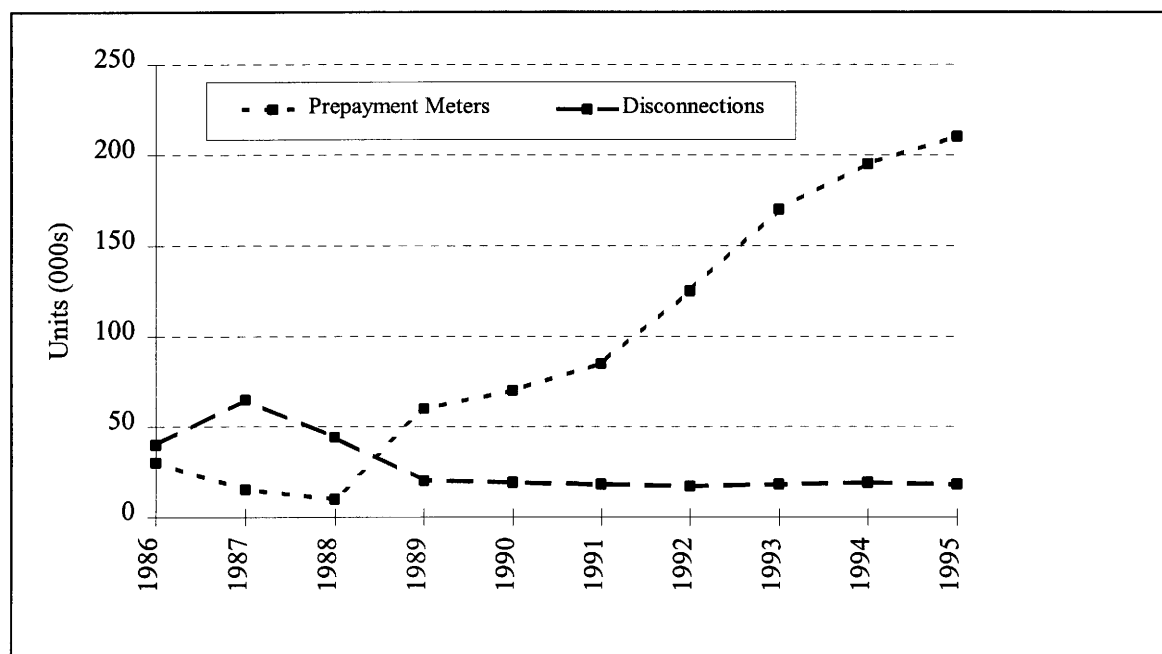
On the supply side, when British Gas was privatised, competition was opened for customers who were heavy users of gas (more than 25 000 therms per annum). In 1992, this threshold was lowered to 2500 therms per annum. British Gas now faces competition from more than 30 other companies.

On the distribution side, the only current player (British Gas Transco, soon to be renamed BG plc) is obliged to provide gas to a customer whose property is within 23 metres of a gas main pipe. Customers living at a greater distance can be supplied if they are willing to pay the full cost of the connection. Pilot programmes of full competition (including domestic consumers) are currently underway in the South of England in advance of full competition in 1998. Where competition for residential customers exists, a residential customer living within 23 meters of a gas main must be supplied by any provider of gas if a customer requests supply. Larger commercial customers have no rights to insist on supply.

Where customers have a history of poor payment or are regarded as a credit risk then they can have a prepayment meter fitted for gas services. These meters are similar in functionality to the meters described for the electricity and water industries. The impact of prepayment meters on the annual number of disconnections is shown in Exhibit 4.1.

OFGAS requires all suppliers of gas to provide special services to their older, chronically sick or disabled customers including those who are partially sighted or have hearing difficulties. Suppliers provide help and advice on the safe use of gas, including a free gas safety check on request. They also supply special adaptors and controls for those who have difficulty using their gas appliances. However, they do not offer price discounts to such customers.

**EXHIBIT 4.1:** Residential Customer Gas Disconnections in England and Wales versus the Installed Base of Prepayment Meters<sup>3</sup>



#### 4.4 THE WATER INDUSTRY IN FRANCE

There are 13 000 Collectivités in France, local authority bodies which are responsible for water distribution. Each Collectivité either has its own water department (a régie) or subcontracts water distribution to one of the five major private water groups such as Lyonnaise des Eaux and Compagnie Générale des Eaux. Approximately 45% of the Collectivités run their own water department, but the private water companies are dominant in densely-populated areas and service 75% of the population of France. There is real competition to be the water company in each Collectivité; every year there are around 400 competitions for water services and around 50 of the resulting contracts are awarded to a supplier other than the incumbent. There is no regulator for the water industry; the Collectivités, as the customers of the water suppliers, ensure that standards are maintained.

<sup>3</sup> UK Gas Consumers Council Annual Report, 1995. Reproduced by kind permission of the UK Gas Consumers Council.

There are no special schemes providing assistance for customers with payment difficulties or special needs. However, disconnections are very rare: if a customer gets into difficulties, the water company will usually contact the customer and the local authority, and special payment arrangements and extra assistance are arranged.

#### **4.5 THE GAS INDUSTRY IN VICTORIA, AUSTRALIA**

Gas & Fuel is a monopoly which supplies gas to customers in Victoria (there is no single gas supplier which covers the whole of Australia). It is currently owned by the State government, but this position will change in mid-1996 with the break-up and privatisation of the gas industry nationwide, when it will fall under the responsibilities of the Regulator-General. Gas is currently charged at a standard price across the State, although this may not continue under the new regime.

Gas is piped from the mains located in the street to the gas meter, usually located at the house. If this distance is up to 23 metres from the main gas pipe then the customer pays a standard connection charge. For distances of between 23 metres and 55 metres, the customer pays an additional fee to cover the cost of the connection work. Gas & Fuel will not carry out installations for distances greater than 55 metres, but will position the meter at a suitable location, usually the street, with the remaining distance to the customer's premises being the responsibility of the customer. Most of the State is serviced, with the exception of some country areas for which supply is not economic. In such areas customers may choose to use either bottled gas or electricity. 98% of houses built now are connected to gas.

Gas & Fuel monitors itself against a number of self-generated obligations which are based on customer satisfaction levels and benchmarked against gas companies in other States and overseas. Customer satisfaction is surveyed on a continual basis.

There is no low user scheme, but Gas & Fuel is developing some programmes for the disabled and elderly. Its universal service activities for 1995 included:

- Easy-Way instalment payment scheme, A\$1.7 million (ECU1 million)
- administration of State Government's Winter Energy Concession to pensioners and beneficiaries, A\$0.5 million (ECU0.3 million).<sup>4</sup>

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<sup>4</sup> Gas & Fuel Annual Report 1995.

There is a formal disconnection process. First, the Gas & Fuel will try to agree a payment plan. If this is not possible, the customer applies for an Energy Relief Grant (ERG), a once-off payment of the bill funded by the State government. If the customer still cannot pay, options such as council assistance, charities or financial counselling are explored. The customer is disconnected as a last resort. A customer is reconnected once the account is paid, and must pay a reconnection fee of A\$15 (ECU9) or a minimum of A\$30 (ECU18) if the service was disconnected at the street. A deposit is required if a customer has been disconnected due to arrears more than twice.

#### **4.6 THE WATER INDUSTRY IN VICTORIA, AUSTRALIA**

There are three water and sewerage companies ('Licensees') operating in Melbourne. Water companies serving rural areas in the State of Victoria are not currently regulated. The Licensees must supply the customer with water supply service to meet his reasonable needs, except if the water supply is restricted or disconnected in accordance with the customer charter. The Licensees are not required to provide a customer with the minimum flow rate if:

- the property service pipe is the customer's responsibility to maintain and is damaged or in poor condition
- there is a planned or unplanned interruption of the customer's water supply
- there is a water shortage due to peak summer demand
- there is a water shortage due to a drought or an unavoidable cause
- Melbourne Water Corporation<sup>5</sup> has informed the Licensees that the water supply should be reduced to avoid a water shortage in the future.

In the last two cases, supply of water will be restricted to all customers in equal proportions unless the Minister decides otherwise.

Quality of service measures exist relating to water quality and interruption of service. Licensees must ensure that the supply of drinking water is clear and free from objectionable odour and taste, and that the quality of the water complies with the health-related parameters set by the Department of Health and Community Services. They must ensure that there are no more than five unplanned interruptions of a customer's water

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<sup>5</sup> Melbourne Water collects and stores water in dams and reservoirs, distributes to retail companies, treats sewage collected by retail companies and operates the drainage system.

supply, and three unplanned interruptions of a customer's sewerage service each year. The water supply must be restored as quickly as possible, with the licence conditions requiring 90% of interruptions restored within five hours. The Licensee must also ensure customers have access to emergency supplies of water. Interruptions to the sewerage service must be restored as quickly as possible. For planned interruptions, the Licensee must inform customers in writing of the time and duration at least two working days in advance.

Customers are eligible for concessions if they hold a Pensioner Concession Card, Health Care Card, Health Benefits Card, Dependent Treatment Entitlement Card (for War Widows) or Personal Treatment Entitlement Card. Special needs customers, such as those who require a water supply to operate a life support system, should be registered with the Licensee. Customers registered for health reasons cannot be disconnected for non-payment.

If a customer is having difficulty in paying the bill, the Licensee must give the customer information on alternative payment schemes, once-off government funded financial assistance (under the Water Rates and Charges Relief Grants Scheme), government-funded concessions to eligible customers or refer the customer to a no-cost and independent financial counsellor. A customer owing more than A\$75 (ECU47) may be disconnected due to non-payment, but only as a last resort after other options have been fully explored. Customers cannot be disconnected if it is a Friday, a weekend, public holiday or the day before a public holiday. Service is restored once payment is received, or agreement over how payment will occur has been reached. A Licensee may charge a reconnection fee.

#### **4.7 THE POSTAL SERVICE IN AUSTRALIA**

Australia Post operates under the Australian Postal Corporation Act 1989. Section 27 of the Act requires that:

- Australia Post provide a letter service for both domestic and international mail
- the letter service be available at a single uniform price for standard letters carried within Australia by ordinary post
- in view of its social importance, the letter service be reasonably accessible to all people in Australia on an equitable basis, wherever they reside or carry out business
- the performance standards (including delivery times) for the letter service reasonably meet the social, industrial and commercial needs of the Australian community.



The cost of providing universal service was estimated to be A\$65 million (ECU40 million) for 1994/95.

Universal service covers only the letter service, not parcels. The standard letter rate is A\$0.45; other items such as large letters and bulk posting are not uniformly priced.

There is a daily delivery service, five days a week, to 98-99% of households. Letters are delivered to the edge of the property in most cases. In some country areas where there is no regular delivery service, a roadside service is provided by a contractor at a convenient location. According to its 1994/95 Annual Report, Australia Post services 7.7 million addresses. Of those, 2.2 million addresses are in rural and remote areas: 94% received five deliveries per week (compared with 99.8% in metropolitan areas). Of the remainder in rural and remote areas, 5.8% received deliveries two to four times per week, and 0.2% once a week. Around 8% of rural and remote delivery points do not currently receive a "to the property" delivery service, but could do so if they wished. Many of these customers prefer existing arrangements, such as a concessional Post Office Box.

Location of street posting boxes are at Australia Post's discretion, but it does consult with local communities as to location, and may continue to maintain boxes at uneconomic locations if they are close to particular locations, such as homes for the elderly.

There are no special provisions for the disabled or elderly made available by Australia Post, except that pensioners can get one free redirection order per year (redirecting mail for three months to a new permanent address). The Social Security Department administers a scheme to subsidise free postage of certain articles for some disabled people, such as the blind, and pays Australia Post market rates for the service.

#### **4.8 THE POSTAL SERVICE IN NEW ZEALAND**

New Zealand Post was established as a State-owned enterprise in April 1987, and is registered as a limited liability company. The Postal Services Act 1987 (as amended by the Postal Services Amendment Act 1990) provides New Zealand Post with a statutory monopoly on the commercial delivery of letters under 200g in weight, unless at least NZ\$0.80 or more is charged. The statutory monopoly covers standard letters, bulk mail, and certain large items.

In return for the statutory protection of the Act, New Zealand Post concluded a Deed of Understanding with the Government, which has been extended to 31 March 1997. Under

the terms of the Deed, New Zealand Post is required to maintain defined levels of service and price for the basic letter post. The Deed requires uniform pricing, defines the rate of price rises for the basic letter, and determines the frequency of deliveries and the size of the postal network in terms of postal outlets and delivery centres. NZ Post is required to publish performance results in its Annual Report.

New Zealand Post regularly delivers mail to 1.3 million delivery points: 75% of these are urban residents, 15% are businesses and the remaining 10% are rural residents served either by direct delivery to residential address via a rural delivery box, or through collection facilities offered to the addressee (private box, counter collection or community mail boxes). Rural delivery boxes comprise 8.8% of delivery points and account for 10% of total annual mail. Box holders pay an annual fee of NZ\$80 (ECU44) and have varying frequencies of service: 91.2% receive deliveries six days a week, 8% receive five deliveries per week, and 0.8% receive between one and four deliveries per week.

From 1921, rural householders requiring a delivery service had to pay a rural delivery fee. This charge was abolished in April 1995. While there have been a number of closures of rural post offices in recent years, these were generally replaced by postal agencies which are typically held by some other retail business and are open for longer hours, thus increasing the availability of postal services.

#### **4.9 CONCLUSIONS**

The most important lesson to be learned by the telecoms sector from the other sectors considered in this chapter: the importance of soft access to the network. Soft access eliminates the possibility of the customer getting into difficulty with debt, by ensuring that the customer only has access to the service when it is already paid for. It also reduces the need for the customer to cope with a number of large bills each year. The customer is deprived of service only for the period during which he is unable to afford the service, avoids expensive reconnection charges to be paid when service is resumed, and does not get into difficult disputes with the company providing the service.

The success of soft access in reducing the number of disconnections in an industry is obvious from the experiences of UK electricity, gas and water sectors. In these sectors there has been a dramatic reduction in the number of disconnections from the network since the introduction of soft access schemes: more than 90% in the electricity sector, more than 70% in the water sector and by more than half in the gas sector.

The prepayment meters installed by water and electricity companies are not appropriate for a telecoms solution. However, a scheme which uses some form of rechargeable prepaid calling card could be used. If soft access were applied to customers of telephone services, they would pay considerably more for each telephone call than an ordinary customer. However they would not have to pay a regular rental charge, which is a significant barrier to taking up the service in the first case.

Another lesson from the experience and philosophy of universal service in other sectors is that business customers are deemed to require significantly less protection and fewer guarantees of service than residential customers. This attitude is visible in the UK gas and electricity sectors, and is founded on the belief that there is more competition for business customers.

A third lesson shows how an essential service such as water supply can have different prices for different regions of the country, depending on the cost of providing those services. The prices which water companies in England and Wales charge domestic customers for water supply vary from one part of the country to another, with prices reflecting the costs of providing the water supply. However, the disconnection of customers who are unable to pay for their water supply does not represent a major problem. Indeed the number of water customers who are disconnected (in an industry which does not have national geographical averaging of prices) is significantly lower than the number of telecoms customers who are disconnected (in an industry which does have geographical averaging).

## 5/ Technology and Demand Scenarios

There is a strong consensus among those interviewed and in the literature that the penetration of a service should be an important factor in determining whether that service is considered a universal service. In other words, penetration is seen as a proxy for demand. It is in the network completion phase of a service that the issue of universal service becomes important, as it then that we see the failure of the market to bring service to all citizens as those who cannot afford the service are not connected.<sup>1</sup> When penetration reaches high levels, then those who cannot afford the service are put at a disadvantage.

Currently only basic telephony services are included in definitions of universal service. However, a number of new services are now being rolled out which may enter the network completion phase in the next ten years or so. Analysys has identified cellular telephony and basic rate ISDN as the two services which are most likely to develop in this way. We have therefore developed two scenarios which project demand for these services as a proportion of the number of households in Europe, over the next ten years.

It was originally proposed that this study should investigate the likely availability of a wide range of new services (through detailed demand scenarios) and assess whether users and regulatory bodies would at some stage start to perceive these new services as being either a basic public social good, a transactional good or a merit good (through an understanding of the triggers which lead to a change in the perception of a service or good). However, the results of the interview programme indicated that such detailed analysis would not be particularly relevant (see Chapter 3), and that a more straightforward forecast of the development in market penetration of currently available services such as traditional PSTN, mobile and ISDN would be appropriate.

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<sup>1</sup> Cave, M, Milne, C, and Scanlan, M, (1994): *Meeting Universal Service Obligations in a Competitive Environment (ONP-CCP(95)*, Report to CEC DGIV (March 1994).

The two demand scenarios described in this chapter were developed to assess the likely penetration rates for these services over the period 1995-2005 in three country groups. These country groups are characterised by the short- to medium-term outlook for the development of competition and are composed as follows:

- **Group 1:** countries where full competition is well established (UK, Sweden, Finland)
- **Group 2:** countries in which competition is currently developing (France, Germany, the Netherlands) or where full competition has recently been introduced (Denmark)
- **Group 3:** others (Austria, Belgium, Spain, Portugal, Greece, Luxembourg, Italy and Ireland).

These demand scenarios form the basis for an analysis of the requirement for future revisions to the definition of universal service. In addition, a high-level analysis is undertaken of the costs associated with such revisions. This high level analysis is based on current price levels which are assumed to be related to the cost of providing the services. The results reflect the cost of provision and not the 'net cost' to a universal service fund which is likely to be lower.

The general framework of Cave *et al* is used to interpret the projected penetration rates in the context of universal service. A detailed description of this framework can be found in Annex C. In summary, it describes four stages in service take-up, each of which is characterised by a certain level of take-up by residential and business users:

- **Stage 1: network establishment**, notional residential penetration between 0% and 10%, business penetration between 0% and 30%. A current example is basic rate ISDN.
- **Stage 2: wide geographical reach**, notional residential penetration between 5% and 30% business penetration between 20% and 80%. A current example is mobile telephony.
- **Stage 3: mass market take-up**, notional residential penetration between 20% and 85%, business penetration between 70% and 100%. Only PSTN services have reached these levels of penetration in *all* Member States although mobile telephony has reached these levels in some Member States, particularly the Scandinavian countries.
- **Stage 4: network completion**, notional residential penetration between 75% and 100%, business penetration of 100%. Only PSTN services have reached this level of penetration.

Each of these stages has different implications for universal service. This study is primarily concerned with the universal service issues which characterise the network

completion phase. As mentioned above, this stage is characterised by a household penetration of between 75% and 100%, and 100% penetration among business users. The demand scenarios in this chapter therefore focus on the development of household penetration reflecting the views expressed by those interviewed, who considered universal service to be a matter of concern only for the residential sector.

Apart from the potential inclusion of new services such as ISDN and mobile telephony in a future definition of universal service, the cost of universal service will also be affected by changes in existing usage patterns. In particular, the strong growth in Internet usage leads to an increased usage of local calls by residential users, both in terms of volume and duration. This issue is explored in Section 5.5.

In addition to our analysis of residential demand, we have also undertaken a limited analysis of the cost of providing advanced communication facilities and services to institutional users. In particular, this chapter presents initial results of an analysis of the cost of providing ISDN access to schools, hospitals and public libraries. The additional cost associated with subscribing to Internet services, buying appropriate customer premises equipment and the installation of the required internal cabling is also considered.

This chapter is divided into seven sections. Section 5.1 describes in qualitative terms the two penetration scenarios which have been developed for each country group. The methodology used for quantifying household penetration rates is discussed in Section 5.2. The results of the scenarios in terms of take-up of the services and implications for the definition of universal service are analysed in Section 5.3. Section 5.4 analyses the likely costs associated with extending the universal service definition as outlined in Section 5.3. Further implications for the cost of universal service of increased utilisation of the local loop due to factors such as increasing Internet access are discussed in Section 5.5. Section 5.6 deals with provision of advanced communication facilities and services to institutional users, particularly the supply of ISDN to schools, hospitals and libraries. Finally, Section 5.7 summarises the overall conclusions and policy implications.

## **5.1 PENETRATION SCENARIOS**

As part of ongoing research into the development of the European telecommunications sector Analysys has developed a number of demand forecast scenarios for traditional

PSTN, ISDN and mobile services. The results have been published in several studies undertaken by Analysys for the Commission.<sup>2</sup>

For this study we have considered two demand scenarios. The key factor distinguishing these scenarios is the development of telecoms liberalisation. In particular the timing of the events which distinguish the two scenarios are largely driven to the degree of consensus and unity achieved in the Single Market.

Under the first 'rapid' scenario, there is a swift and uniform implementation of the pro-competitive liberalisation framework proposed by the Commission, reflecting the fact that some Member States have chosen to introduce liberalisation in advance of the 1998 deadline. It takes full account of the various starting positions of the Member States, but assumes that they move rapidly to create a stable and pro-competitive environment for investors, that investment opportunities are many and varied, and that the incumbent TO can also benefit from these opportunities. New operators are granted licences without delay and with the minimum of procedure and protocol. Disputes are addressed speedily by authoritative and independent NRAs.

Under the second 'gradual' scenario Member States are moving towards liberalisation, but at different rates; for instance, countries with derogations make use of them in order to delay the onset of full liberalisation, but only Greece is expected to use the full derogation period to 2003. The key issues of developing effective regulatory frameworks, promoting competition, implementing ownership strategies for incumbent TOs, pricing and tariff rebalancing are implemented promptly in some Member States, but delayed in others. The consequence is a more liberalised market in most countries but a longer path to full liberalisation in others with the effects of liberalisation only being felt in 1999 or 2000 rather than in early 1998.

In terms of the effects of these scenarios on the three country groups, **Group 1 countries** (Finland, Sweden and UK) have markets which are already liberalised and have been

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<sup>2</sup> *Performance of the Telecommunications Sector up to 2010 under Different Regulatory and Market Options*, Analysys Final Report for CEC DGXIII/D2 (February 1992).

*Provision of Quantitative Data as Background Material for the Bangemann Group*, Analysys Final Report for EC DGXIII (May 1994).

*The Impact of Advanced Communications on European Growth and Trade*, Final Report of the METIER Project for EC DGXIII (September 1995).

*Impact of Telecoms Liberalisation on the Single Integrated Information Market*, Analysys Draft Final Report for EC DGXV (June 1996).

liberalised for some time, and have few if any regulatory barriers remaining to competition. As a result we anticipate very little difference between the two scenarios for Group 1 countries.

**Group 2 countries** (Denmark, France, Germany, Luxembourg and the Netherlands) will either implement liberalisation measures ahead of the EU deadlines (or have already), or at least in good time to meet the EU deadlines. However, there are some differences between the scenarios with regard to the pace of progress, and particularly the level of commitment, towards liberalisation. In the rapid scenario we assume that national regulators are quickly given the power to establish frameworks for negotiating interconnect agreements and a fair and reasonable licence agreement. In the gradual scenario such a move to a liberalised environment is delayed until well into 1999. Where price controls are not already in place, these are agreed before 1998 under the rapid scenario, but delayed until around 2000 in the gradual scenario.

In the rapid scenario, governments successfully distance themselves from the incumbent by selling off a majority stake in the operator by around the end of 1997. In the gradual scenario the market reacts negatively to the likely prospects for such operators and so the share sale is delayed until closer to the end of the decade. In the rapid scenario liberalisation of voice services and infrastructure begins in 1996 and the market is fully liberalised in 1997, in advance of the 1 January 1998 deadline. In the gradual scenario liberalisation only becomes a reality after the 1998 deadline, because of legal challenges to liberalisation legislation and less than wholehearted political support for the liberalisation process.

**Group 3 countries** (Austria, Belgium, Greece, Ireland, Italy, Luxembourg, Portugal and Spain) achieve at best slow progress in implementing the liberalisation measures. Internal political difficulties, the agendas of those with a vested interest in the existing structure, and a lack of political commitment to the liberalisation process all combine to hinder progress.

In the rapid scenario, difficulties currently being experienced prove to be only short-term and are overcome quickly. The regulators in all three countries establish growing power over the market in 1998. The countries which have secured derogations for liberalisation move more rapidly than required. By 2000 the markets in all countries have been effectively liberalised, and effective regulators impose price-cap regulation on the incumbent TOs. Under the gradual scenario, intentions to implement liberalisation evaporate and the markets remain clear of competition until well into 1999. Even then, national regulators are unable to effectively control anti-competitive practices, and real



liberalisation is delayed until 2000. The countries with derogations make use of these, with Greece applying for the full possible derogations to 2003.

The regulatory scenarios outlined above would have a significant impact on the structure and the development of the telecoms sector. Table 5.1 provides an overview of the likely number of operators providing traditional services in the EU under each scenario, and indicates their network coverage (in terms of accessible population).

**TABLE 5.1:** *Traditional Services Market Structure and Coverage*

	<i>Number of Operators</i>			<i>% of European Population with Access to More than one Operator</i>		
	<i>1997</i>	<i>2000</i>	<i>2005</i>	<i>1997</i>	<i>2000</i>	<i>2005</i>
<b>Local</b>						
Rapid	74	92	125	7%	19%	37%
Gradual	74	85	91	7%	17%	29%
<b>Long Distance</b>						
Rapid	22	38	54	17%	44%	77%
Gradual	22	37	45	17%	36%	59%
<b>International</b>						
Rapid	5	8	12	7%	47%	84%
Gradual	4	4	5	7%	31%	61%
<b>International Resale</b>						
Rapid	12	16	8	38%	88%	98%
Gradual	12	18	22	38%	75%	92%
<b>Service Providers</b>						
Rapid	5	8	12	6%	31%	55%
Gradual	3	5	7	5%	20%	45%

## 5.2 HOUSEHOLD PENETRATION

As previously mentioned, this study builds on previous forecasts of the size of the subscriber base for traditional PSTN, ISDN and mobile services between 1995 and 2005 in terms of the total number of connections. The analysis is taken further in this study, through analysing the development in the business and residential sector separately. In particular this study focuses on assessing residential household penetration measured in the number of connections per 100 households. It is important to note that the penetration figures used here indicate the total number of connections divided by the total number of households, which does not necessarily equate to subscribing households. Data on

household penetration was only available for eight Member States (see Table A1 in Annex D). This implies that the penetration figures used in this study will in general be higher than the actual number of subscribing households. As a consequence the study takes an optimistic view of the network roll out stage achieved as set out in the framework of Cave *et al.*

Population forecasts from the World Bank and the ITU/WTI have been used in constructing these penetration estimates. Forecasts on the number of households have been obtained from a variety of sources, including the World Bank; each shows a gradual decline in the average size of household. This implies that the number of households is growing at a faster rate than the total population. Whereas the annual population growth rate between 1996 and 2005 is projected to be around 0.3%, the total number of households is projected to grow around 1.3% per annum. As a consequence penetration rates measured per household grow at a slower pace than penetration rates measured per head of population.

Our assumptions regarding the business/residential split are in keeping with the hypothesis that, as the overall penetration rate of a service increases, business lines represent a reducing proportion of total lines: more and more residential users will adopt the service as it matures and the service becomes more affordable. For example, residential lines accounted for around 79% of total connections in Europe in 1990 and for an estimated 82% in 1996. However, determining the proportion of total connections which can be classified as residential is problematic, as there is no common definition of a residential connection among the various European TOs

- The best data is available for traditional PSTN connections: it is relatively easy to distinguish residential connections, as TOs charge differently for residential and business connections.
- It is much more difficult to obtain data on the split between business and residential connections for mobile services. Tariff structures and plans are based around monthly usage and do not discriminate between business and residential users. However, it is reasonable to assume that residential users account for the majority of subscribers to the so-called low-user tariff packages. Studies we have conducted for mobile operators suggest that subscribers to low-user packages account for nearly 50% of the total UK subscriber base in 1996. However, the UK mobile market is relatively mature and so we have assumed that residential subscribers will account for around 80% of subscribers to mobile telephony low user packages by 2005 across Europe.

- The uptake of ISDN is currently mainly restricted to business users. However, we anticipate that residential lines will account for an increasing proportion of total lines as overall ISDN penetration grows. This reflects the policy of most European TOs to price ISDN in a similar way to PSTN. Annex E shows how the pricing of ISDN is related to the pricing of PSTN. As the price of terminal equipment falls with increased penetration of the business market for ISDN we will begin to see ISDN penetration of the residential market. We therefore assume that by 2005 residential ISDN will account for about 20% of lines installed per year across Europe.

### 5.3 DETAILED PENETRATION SCENARIOS

This section describes the penetration rates achieved for PSTN, ISDN and mobile services for business and residential users, for each of the three country groups under each of the liberalisation scenarios:

- the results for each country group are discussed in Section 5.3.1
- an overall summary is presented in Section 5.3.2.

#### 5.3.1 Results for the Country Group

##### *Group 1: Fully Competitive Countries*

As described in Section 5.1, the UK, Sweden and Finland have markets which are already liberalised, and have few if any regulatory barriers remaining to competition, thus the results for the two scenarios will be broadly the same.

Under the gradual scenario PSTN retains the highest penetration rates of the three services considered. However, due to increased competition from ISDN and mobile services, penetration rates fall over the whole forecast period. Household PSTN penetration falls from 100 lines per 100 households in 1996 to 78 lines per 100 households by 2005. However, because of the relatively high growth in the number of households, the actual number of PSTN lines is projected to keep growing until 1999.

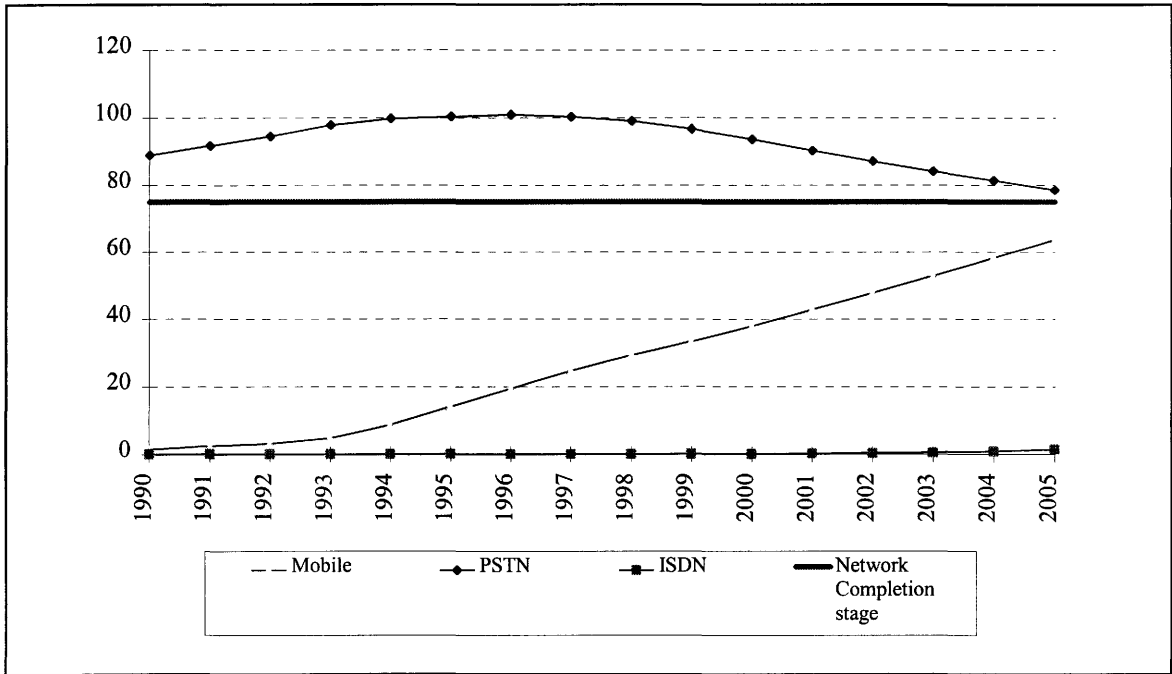
Although total ISDN connections are forecast to grow at an annualised rate of 31% over the period, the majority of these lines are taken up by business users. Residential ISDN lines are assumed to account for 0.5% of newly installed ISDN lines in 1996 and for 20% by 2005. This results in a residential penetration rate of just over 1 connection per 100

households by 2005. In contrast, for business users ISDN connections will stand at 54% of total PSTN and ISDN connections by 2005.

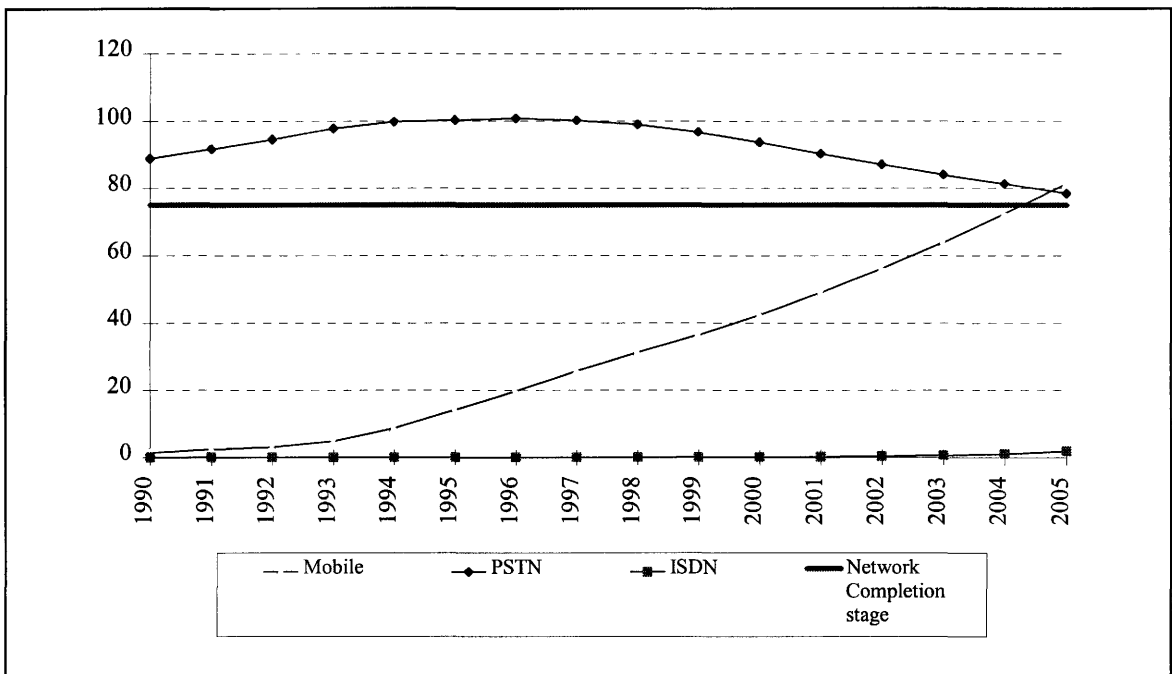
Mobile connections currently stand at just below 20 per 100 households. Under the gradual scenario this is expected to rise to around 64 per 100 by 2005, implying an annualised growth rate of just below 16% for residential connections. This growth rate is higher than that for the total mobile market (10%), indicating the relative maturity of mobile services as compared to ISDN. Note that our analysis implicitly assumes that sufficient radio spectrum will be made available to achieve the relative high projected penetration rate. If this is not the case, and the available spectrum becomes congested, operators are likely to raise their tariffs in order to ease congestion and retain those customers who are willing to pay the most. This could mean that the service could become unaffordable for some users, potentially at relatively low penetration rates.

Under the rapid scenario, PSTN penetration rates display a trend similar to that shown under the gradual scenario. However, in this case, mobile penetration in residential households is expected to overtake PSTN penetration: by 2005 the penetration rates are 81 and 78 connections per 100 households respectively. This level represents a fall in the overall demand for PSTN, as many residential customers substitute mobile for fixed telephony. In order to achieve this penetration, mobile services have to grow at an annualised rate of just under 19% (overall market growth rate is around 13%). Again this presupposes enough spectrum will be (made) available. ISDN penetration remains low among residential users: a penetration of 2 connections per 100 population is expected by 2005. For business users ISDN connections will stand at 64% of total ISDN and PSTN connections. The detailed results for Group 1 are illustrated in Exhibits 5.1 and 5.2.

**EXHIBIT 5.1:** Residential Penetration, Gradual Scenario, Group 1 Countries



**EXHIBIT 5.2:** Residential Penetration, Rapid Scenario, Group 1 Countries



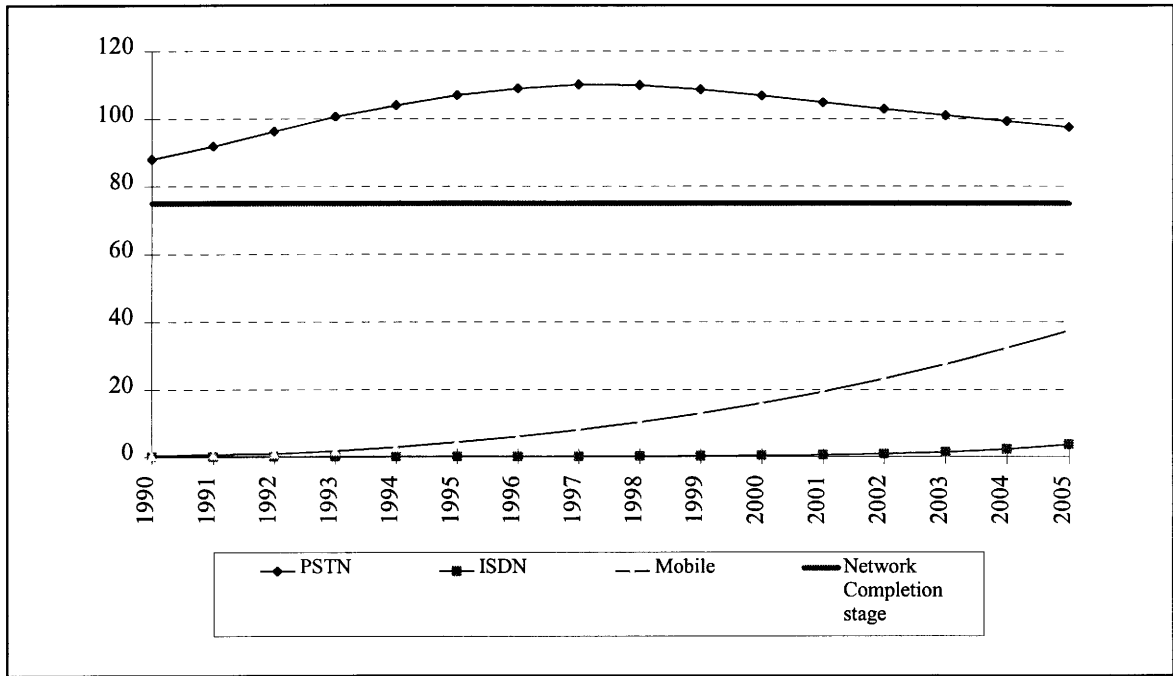
*Group 2: Approaching Competition*

For Denmark, France, Germany and the Netherlands, PSTN remains the dominant service in both scenarios. Historically, Group 2 countries have experienced higher penetration of basic PSTN than Group 1 countries. PSTN penetration is projected to start falling from a peak of 110 connections per 100 households in 1977 to 97 connections by 2005. Under both scenarios the absolute number of residential PSTN connections is projected to continue growing until 1999, and the absolute number of residential PSTN connections in 2005 is higher than in 1996.

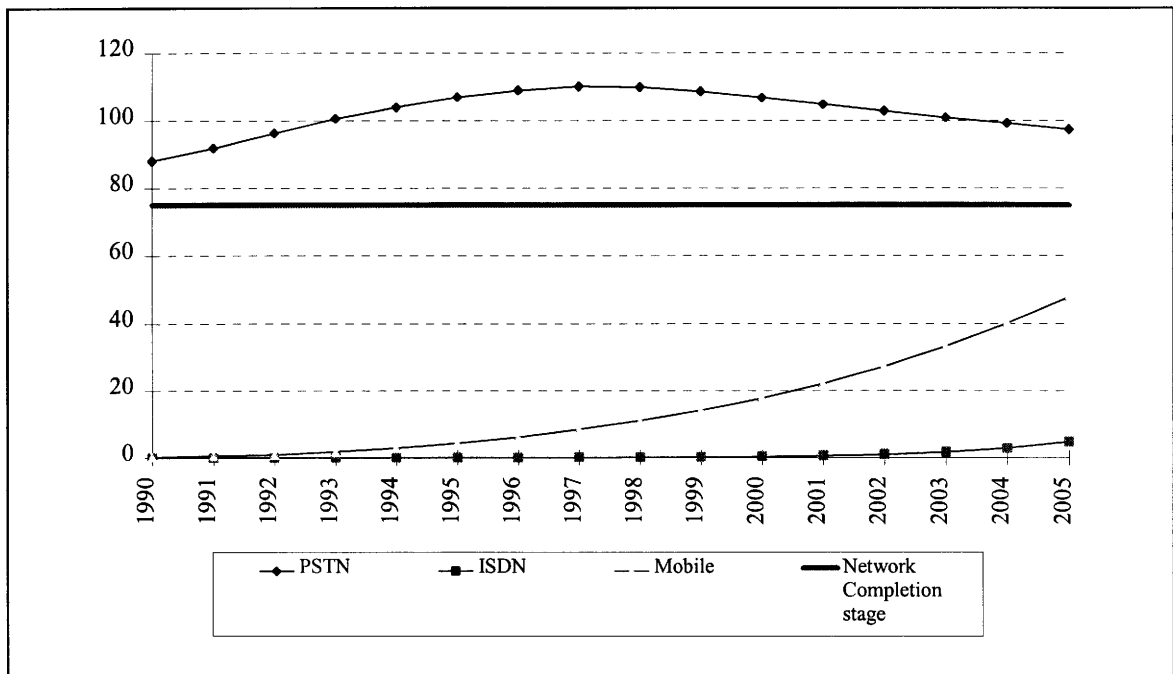
Mobile penetration is projected to reach between one third and half of the PSTN penetration rate by 2005 at 37 connections per 100 households under the gradual scenario and 47 connections per 100 households under the rapid scenario. This represents annual growth rates in the number of connection of 24% and 27% respectively. Although these growth rates are higher than those for Group 1 countries (because mobile services in Group 2 countries are typically less mature), the much lower starting point in 1996 means that penetration rates are still lower by 2005.

Similar to Group 1 countries, take-up of ISDN remains very low in both scenarios, reaching just 4 and 5 connections per 100 households respectively. Note that these projections indicate a higher take up of ISDN in Group 2 countries than in Group 1 countries. This is mainly driven by the historic commitment the countries in this group have made to promote ISDN. For business users ISDN connections account for 61% and 68% respectively of total PSTN and ISDN connections. The detailed results for Group 2 are illustrated in Exhibits 5.3 and 5.4.

**EXHIBIT 5.3:** Residential Penetration, Gradual Scenario, Group 2 Countries



**EXHIBIT 5.4:** Residential Penetration, Rapid Scenario, Group 2 Countries



*Group 3: Late Competition*

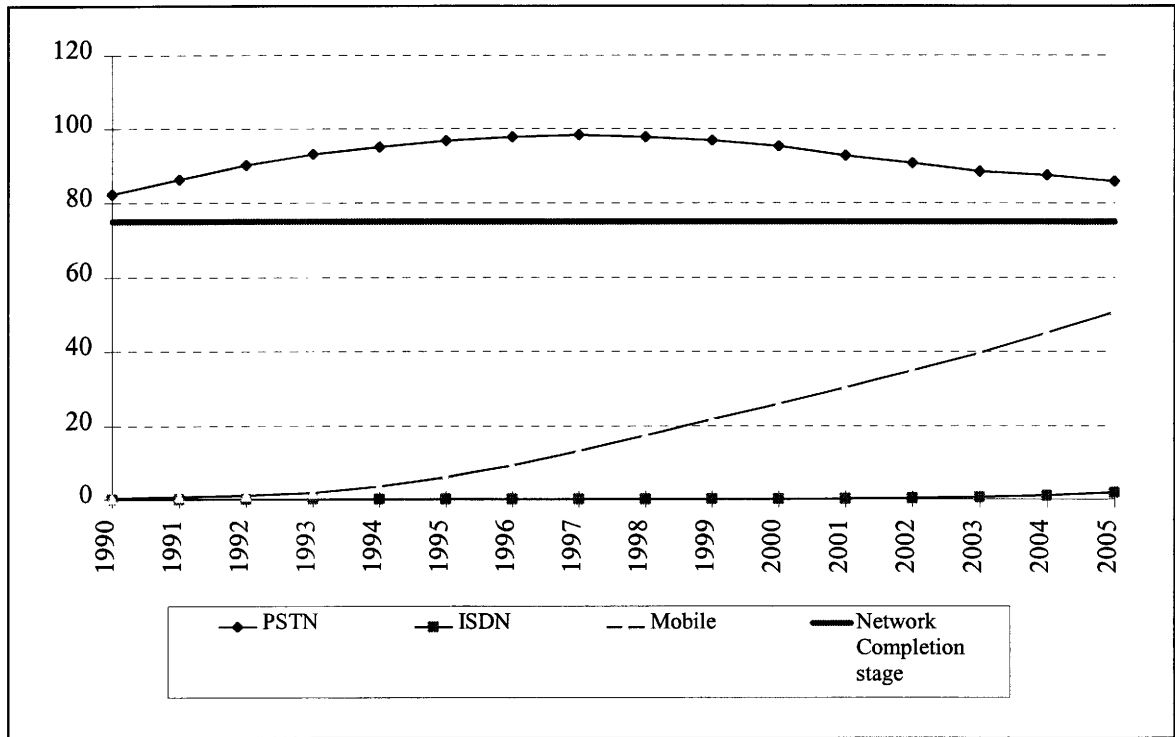
Historic figures indicate that residential PSTN penetration is the lowest in the Group 3 countries (Austria, Belgium, Spain, Portugal, Greece and Ireland). However, even in this Group the projections indicate that PSTN penetration rates are likely to start falling from 1997 onwards. The absolute number of residential PSTN connections by 2005 is projected to be slightly below the level seen in 1995.

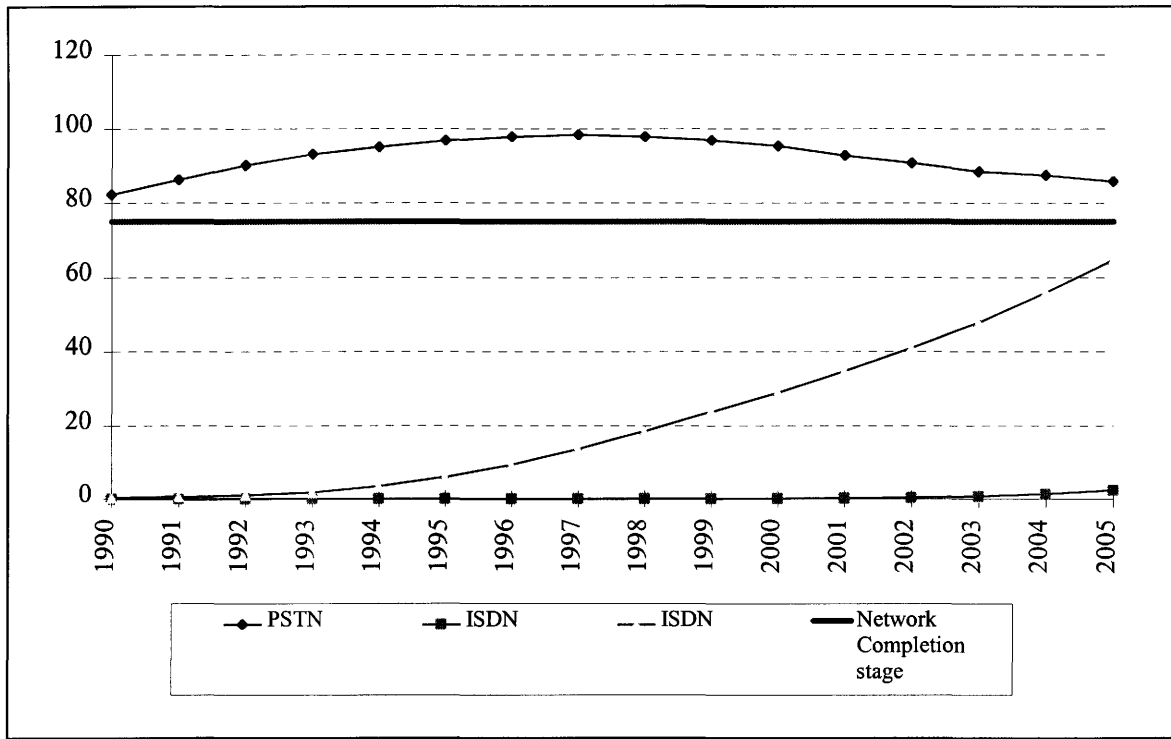
Mobile services are projected to achieve higher penetration rates in Group 3 countries than Group 2. This is because Italy, which represents just under half of the population of Group 3, is expected to have a high penetration of mobile telephony at the end of the period. Additionally mobile penetration in France and the Netherlands are expected to be low, reducing the expected penetration of Group 2. Overall residential penetration is projected to reach 51 and 65 connections per 100 households respectively. This represents annual growth rates of 17% and 20% respectively.

Residential ISDN is projected to reach penetration levels of around 2 lines per 100 population by 2005 under both scenarios. Business ISDN connections are projected to account for between 43% and 50% of total combined PSTN and ISDN connections by 2005. The detailed results for Group 3 are illustrated in Exhibits 5.5 and 5.6.



EXHIBIT 5.5: Residential Penetration, Gradual Scenario, Group 3 Countries



**EXHIBIT 5.6:** Residential Penetration, Rapid Scenario, Group 3 Countries

### 5.3.2 Overall Summary of Results

Table 5.2 summarises the key findings of the demand projections; for comparison, we have also included projections of PSTN penetration. Our projections for residential ISDN penetration indicate that ISDN will remain firmly in Stage 1 (Network Establishment) for all country groups, under both scenarios. Given that this study is primarily concerned with the universal service issues which relate to the Network Completion Phase (stage 4) characterised by a household penetration of between 75 and 100 connections per 100 households, it is quite clear that ISDN is not suitable for inclusion in a revised definition of universal service.

However the projections for mobile services indicate that it is very likely that Stage 3 (Mass Market Take-up) will be achieved in all three country groups, although penetration rates differ between country groups and between the different scenarios. Moreover, under the rapid scenario, Group 1 countries have a projected penetration rate of 81 connections per 100 households and are thus on the threshold of Stage 4 (Network Completion). Thus, under favourable circumstances, mobile services can achieve penetration rates

which would make the inclusion of mobile services in an extended definition of universal service a feasible policy option towards the beginning of the next century.

*TABLE 5.2: Summary of Penetration Forecasts (connections per 100 households by 2005)*

	<i>Group 1</i>	<i>Group 2</i>	<i>Group 3</i>
ISDN gradual	1	4	2
ISDN rapid	2	5	2
Mobile gradual	64	37	31
Mobile rapid	81	48	65
PSTN (both)	78	97	86

The interviews reported in Chapter 4 suggested that user organisations (and others) have not started to consider whether mobile services could become a universal service issue, and have instead focused their attention on ISDN. The results in Table 5.2 indicate that there is likely to be pressure for a change in focus from ISDN to mobile telephony.

#### **5.4 COSTS OF EXTENDING THE DEFINITION OF UNIVERSAL SERVICE**

This section considers the effect of including mobile services in an extended definition of universal service in terms of the additional costs this would impose on universal service providers, i.e. the difference in cost between serving 75% to 85% of all households and serving 100% of all households. It examines the effect for Group 1 countries under the Rapid Scenario. In this scenario, mobile penetration in Group 1 countries is projected to reach 84 connections per 100 households by 2005. This would mean that at least 16% of households (around 26 million) did not subscribe to mobile services if such services were not included in universal service provision.

Analysys has undertaken detailed universal service costing studies in the UK, Sweden, Switzerland and the Netherlands. The methodology used in these studies is based on the concepts of revenue foregone and avoidable cost. A detailed description of the methodology can be found in "The Costs, Benefits and Funding on Universal Service in the UK", published by Oftel. This report describes the results of a study Analysys undertook for Oftel in 1995.

In order to calculate the additional cost to mobile operators of including mobile services within universal service, we have undertaken a high level analysis based on the same methodology as used for these USO studies. However, in this context it is more appropriate to refer to long-run incremental cost (LRIC) rather than avoidable cost, given that we are considering the cost of increased penetration and not the cost of an existing burden. The assumptions made with regards to the long-run incremental cost and the revenues foregone are outlined below:

- **Incremental cost.** Based on a number of engineering economic studies which Analysys has undertaken in recent years, we estimate that the long-run incremental cost per mobile subscriber at 85% overall penetration is approximately ECU75 a year.<sup>3</sup> We have assumed no change in the long run incremental cost over the period to 2005. This is a prudent approach: a lower LRIC might reflect technological progress but a higher LRIC might reflect spectrum congestion.
- **Revenues foregone.** It is reasonable to assume that if these households will be offered incentives to subscribe to mobile services the vast majority of these will be low revenue customers. A recently published tariff comparison study by Analysys shows that the bill for total cost of service faced by a low-usage subscribers varies substantially between different operators: in Sweden such a subscriber would currently pay just ECU55, while in France the equivalent costs around ECU380 a year.<sup>4</sup> We have assumed that by 2005 average revenue across the EU will fall to ECU 55. We have not included any revenue from incoming calls.

Based on these assumptions, mobile operators would lose ECU20 a year per subscriber. The total cost for the 26 million additional low subscribers would therefore be ECU520 million a year.

It is instructive to compare this total cost with the total revenues earned by mobile operators. A recent Analysys study estimated that these revenues would be just under ECU59 billion by 2005.<sup>5</sup> However, this figure excludes the ECU1.4 billion extra revenue earned from the 26 million additional low revenue subscribers, which increases the

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<sup>3</sup> *Local Loop Cost Study*, Analysys Final Report for Ofel (April 1994).

<sup>4</sup> *Cutting the Cost: The Falling Price of Telephony in Europe*, 3rd Edition, Analysys Publications (July 1996).

<sup>5</sup> *Impact of Telecoms Liberalisation on the Single Integrated Information Market*, Analysys Draft Final Report for EC DGXV (June 1996).

revenue to a total of ECU60 billion, i.e. the cost of serving these 26 million low-cost subscribers is equal to around 0.9% of total revenues.

In order to test the sensitivity of the model to changes in revenue and cost assumptions we varied the major assumptions:

- Even if the 26 million customers did not generate any revenue at all, then the cost per subscriber would rise to ECU75, resulting in a total cost of just under ECU2 billion. This represents just 3.4% of total mobile revenues.
- An increased LRIC estimate of ECU150 (+100%) results in a total cost of ECU2.5 billion or 4.2% of overall revenue (assuming revenues per subscriber of ECU55).

Even extreme variations of revenue and cost assumptions did not cause the cost of extending universal service to mobile telephony to rise above 5% of total mobile revenues. This indicates that the results are not overly sensitive to the assumptions with regards to either revenue or LRIC, though further research is required to validate this result.

Our base estimate of 0.9% is comparable to the findings of current USO cost for fixed network operators. Analysys's studies show that the cost of USO as a proportion of PSTN revenues in the range of 0.7% to 1.1% for BT; in the range of 0.8% to 1.2% for Telia; and is in the range 1.7% to 2.2% for the Swiss PTT. Results of other studies undertaken by Analysys are still confidential.

## **5.5 IMPLICATIONS OF INCREASED LOCAL LOOP UTILISATION ON THE COST OF USO**

In addition to considering the impact of extending the definition of universal service on the cost incurred by a universal service provider, it is also useful to analyse the impact of increased utilisation of the local loop on the cost of universal service. This is likely to be an increasingly important factor in the medium term: increased Internet access and other online services, for example, are likely to drive up the level of local call volumes considerably.

In the detailed universal service costing studies Analysys has undertaken in Europe, two main components were analysed: the cost of serving uneconomic areas, and the cost of serving uneconomic customers in economic areas. The definition of an area depends on the network structure and, in practice, on the level of detail at which the operator is able to supply data. In practice, Analysys has used areas served by a single building where that building contains a switch or a remote concentrator. An area is defined as uneconomic

when the cost of serving the area exceeds the revenues received from that area (the definition of costs allows the operator to make a reasonable return on the capital invested in providing the service). The approach developed by Analysys is not simply a process of statistical data analysis, but is based on modelling of the relationships between customer and area characteristics, and their costs and revenues. It is therefore possible for us to estimate the effect of alternative future scenarios, including tariffing developments, by simply altering the input parameters in an appropriate way, and re-calculating the models.

Based on this work, we have analysed the likely change in the cost of universal service if the volume of local calls originating from residential users increased by 100% (from 7 minutes per day on average to 14 minutes per day). Note that Internet services only affect residential outgoing volumes and the incoming call volumes to residential users are therefore assumed to stay at the same level. We have assumed the same increase for users in all revenue categories and no change in the local call tariff. The results indicate that, based on uniformly increased local call volumes and revenues, the current cost of serving uneconomic customers and uneconomic areas could be reduced by 10% and 20%. The analysis undertaken assumes the current price model of per minute call charges for local access. Different results are likely if pricing packages are available offering free local calls or fixed-price unlimited local access.

Note however that this is likely to represent an optimistic case; at least in the short to medium term, the uptake of Internet services is likely to be biased towards intensive telecommunications users, i.e. those customers who currently spend a relatively high amount on PSTN services. These customers are more likely to own PCs and modems required to access the Internet, compared to low-revenue customers. Most of these higher revenue customers are likely to be economic to serve already, apart from those which are uneconomic due to the high cost of serving them, not due to the low revenue they generate. However, in the longer run such services could be taken up more widely, depending on developments in:

- the cost of the equipment required to access the Internet
- the user interface required to access these services
- the range of content and services on offer
- the type of pricing packages in operation for local access.

The effect of this is illustrated in Annex F.

## **5.6 THE SUPPLY OF ADVANCED COMMUNICATION FACILITIES AND SERVICES TO INSTITUTIONAL USERS**

This section presents the results of high-level analyses of the cost of providing advanced communication facilities and services to schools, public hospitals and public libraries. The results should be treated with caution because of problems of inconsistent classification of data items across individual member states, particularly the distinction between primary and secondary schools, and between main libraries, branch offices and distribution points. Thus, the results of this analysis should be seen as a preliminary investigation of the area; additional analysis would be required to reconcile these inconsistencies.

### **5.6.1 Schools**

In this section we present the results of a high level analysis of the cost of providing ISDN access to schools, based on the published number of schools in each country and on published ISDN tariffs from Phillips Tarifica. This is followed by an assessment of the cost of providing these schools with Internet access and then by 'ballpark' estimates of the cost of meeting hardware and software requirements and internal cabling. Again, these calculations are based on normal commercial tariffs and can be therefore be used to assess the likely subsidy required from third parties (e.g. the State) should this be the preferred funding option.

Unfortunately, it is beyond the scope of this study to provide an indication of the likely underlying cost to TOs of providing ISDN access to schools. Considerable detailed modelling would be required to undertake this task, in order to take full account of country-specific cost drivers, such as different network topologies, existing infrastructure and the location of schools.

#### *ISDN Access to Schools*

Exhibit 5.7 shows the estimated number of school sites in the three country groups. In order to take a view of the number of ISDN connections required at each site, it is necessary to identify the number of classrooms per site. Exhibit 5.8 shows the average number of pupils by school type and country group – on the basis of an average class size of 30 pupils, there are on average 4.4 classrooms per primary school and 11.6 classrooms per secondary school. Therefore, assuming that two classrooms share one ISDN channel,

a primary school would require two ISDN channels (one ISDN link), while a secondary school would require six ISDN channels (three ISDN links).



**EXHIBIT 5.7:** *Number of Primary and Secondary Schools by Country Group*  
*[Source: Europa World Yearbook 1996]*

	<i>Primary</i>	<i>Secondary</i>	<i>Total</i>
Group 1	31 418	9706	41 124
Group 2	74 949	31 757	106 706
Group 3	77 262	45 202	122 464
<b>Total</b>	<b>183 629</b>	<b>86 664</b>	<b>270 293</b>

**EXHIBIT 5.8:** *Average Number of Pupils per Site* *[Source: Europa World Yearbook 1996]*

	<i>Primary</i>	<i>Secondary</i>
Group 1	181	368
Group 2	130	421
Group 3	114	293
<b>Total</b>	<b>132</b>	<b>349</b>

Based on these assumptions about the number of connections required and on published ISDN tariffs, the once-off connection cost for connecting all primary and secondary schools is calculated to be ECU95 million, while the yearly rental fees amount to ECU167 million. Exhibit 5.9 presents the detailed results.

**EXHIBIT 5.9:** *Connection and Rental Cost of Providing ISDN to All Primary and Secondary Schools*

	<i>Primary (ECU millions)</i>		<i>Secondary (ECU millions)</i>		<i>Total (ECU millions)</i>	
	<i>Connection</i>	<i>Rental</i>	<i>Connection</i>	<i>Rental</i>	<i>Connection</i>	<i>Rental</i>
<b>Group 1</b>	<b>15</b>	<b>12</b>	<b>15</b>	<b>12</b>	<b>30</b>	<b>24</b>
<b>Group 2</b>	<b>7</b>	<b>22</b>	<b>7</b>	<b>26</b>	<b>14</b>	<b>48</b>
<b>Group 3</b>	<b>19</b>	<b>35</b>	<b>32</b>	<b>61</b>	<b>51</b>	<b>96</b>
<b>Total</b>	<b>41</b>	<b>69</b>	<b>54</b>	<b>98</b>	<b>95</b>	<b>167</b>

It is important to note that Exhibit 5.9 does not include any allowance for usage charges, which are displayed separately in Exhibit 5.10. Assuming both ISDN channels are used

for six hours during the day, five days per school week, 35 school weeks per year, the total usage charge would be ECU2124 million (around ECU7850 per school), roughly 13 times the annual rental charge. As Exhibit 5.10 shows, total annual rental charges are in fact equal to less than one hour of local calls per day.

*EXHIBIT 5.10: Usage Cost Based on per minute Tariffs for Local Calls (Assuming Five School Days per Week, 35 Weeks per Year)*

<i>Usage per day per connection</i>	<i>Primary (ECU millions)</i>	<i>Secondary (ECU millions)</i>	<i>Total (ECU millions)</i>
0.5 hour	37	52	89
1	74	103	177
2	148	206	454
6	888	1236	2124

#### *Internet Access to Schools*

Internet access is normally charged as a flat monthly fee, the cost of which varies according to the access method chosen. Access options range from simple dial-up access to establishing permanent access and becoming a host computer. We assume that schools will opt for the latter option. Monthly fees for this option are likely to be around ECU50 per school, implying a total yearly cost of ECU162 million for all primary and secondary schools in all three country groups, as illustrated in Exhibit 5.11.

*EXHIBIT 5.11: Annual Cost of Internet Access*

	<i>Primary (ECU million)</i>	<i>Secondary (ECU million)</i>	<i>Total (ECU million)</i>
<b>Group 1</b>	<b>19</b>	<b>6</b>	<b>25</b>
<b>Group 2</b>	<b>45</b>	<b>19</b>	<b>64</b>
<b>Group 3</b>	<b>46</b>	<b>27</b>	<b>73</b>
<b>Total</b>	<b>110</b>	<b>52</b>	<b>162</b>

### *Additional Hardware and Software Requirements*

In order for schools to start using the Internet, additional hardware, software and cabling are likely to be required. This section provides a preliminary indication of the likely magnitude of these start-up costs. It is important to bear in mind that these costs, unlike the ISDN connection costs, are likely to recur every three to five years, representing essential upgrades to hardware and software.

The cost of an average multimedia capable computer is assumed to be around ECU1200. An additional ECU350 is required to cover the required Serial Line Internet Protocol (SLIP) or Point to Point Protocol (PPP), and File Transfer Protocol (FTP) software. Equipment manufacturers make special cable kits available for schools, providing two access points for each of six classrooms for around ECU300. However the equipment and cable cost is likely to be only a relatively small percentage of the total cost; the greatest costs will be those incurred to pay for labour. We therefore assume a total cost of ECU1000 for two access points for each of six classrooms.

A primary school with 4.4 classrooms therefore faces an initial outlay of around ECU8000 (ECU6820 for hardware and software and ECU100 for cabling); a secondary school with 11.6 classrooms faces costs of around ECU20 000. This results in a total cost of around ECU 3.2 billion (see Exhibit 5.12).

*EXHIBIT 5.12: Cost of Additional Hardware, Software and Cabling Requirements*

	<i>Primary (ECU million)</i>	<i>Secondary (ECU million)</i>	<i>Total (ECU million)</i>
<b>Group 1</b>	<b>326</b>	<b>204</b>	<b>530</b>
<b>Group 2</b>	<b>577</b>	<b>755</b>	<b>1332</b>
<b>Group 3</b>	<b>534</b>	<b>775</b>	<b>1309</b>
<b>Total</b>	<b>1436</b>	<b>1734</b>	<b>3171</b>

Annualising the cost over the assumed three to five year lifetime results in a per annum charge of between ECU0.6 billion and ECU1.1 billion, i.e. between 3.5 and 6.5 times greater than the annual ISDN rental charges detailed in Exhibit 5.9 and comparable to usage charges incurred with a daily usage of between 3 and 6 hours. These results suggest that providing ISDN access is only part of the story: the issue of enabling schools to make

use of these connections also has to be addressed, and is, in monetary terms, a much bigger concern.

### *Total Cost*

Exhibit 5.12 presents an overview of the likely annual ongoing charges, excluding ISDN connection charges and any usage charges. Roughly two thirds of the total cost shown in this table are due to the annualised cost of hardware and software and internal cabling. It is important to note that daily usage of around four hours would result in total additional usage charges of around ECU908 million. This implies that usage charges could easily account for 50% or more of the total ongoing cost.

*EXHIBIT 5.12: Annual Ongoing Total Cost (including ISDN Rental, Internet Access and Annualised Equipment Costs over Five-year Lifetime)*

	<i>Primary (ECU million)</i>	<i>Secondary (ECU million)</i>	<i>Total (ECU million)</i>
<b>Group 1</b>	<b>96</b>	<b>59</b>	<b>155</b>
<b>Group 2</b>	<b>182</b>	<b>196</b>	<b>378</b>
<b>Group 3</b>	<b>188</b>	<b>243</b>	<b>431</b>
<b>Total</b>	<b>466</b>	<b>498</b>	<b>964</b>

### **5.6.2 Hospitals**

This section estimates the cost of providing each hospital in the three country groups with an ISDN-30 connection. Exhibit 5.13 shows the number of hospitals in each country group.

*EXHIBIT 5.13 Number of Hospitals per Country Group [Source: World Health Organisation]*

	<i>Hospitals</i>
Group 1	2232
Group 2	7690

Group 3	3952
Total	13 874

Exhibit 5.14 shows the once-off connection fee and rental charges incurred if every hospital is provided with one ISDN-30 line. However, depending on the specific applications for which the hospitals will use ISDN, connecting all hospitals might only be part of the task: for example, for applications such as telemedicine, it will also be necessary to provide connections to local doctors, day care centres, universities, etc.

*EXHIBIT 5.14: Connection and Rental Cost of Providing an ISDN-30 Connection to Each Hospital*

	<i>Connection (ECU million)</i>	<i>Rental (ECU million)</i>	<i>Total (ECU million)</i>
<b>Group 1</b>	<b>46</b>	<b>10</b>	<b>56</b>
<b>Group 2</b>	<b>47</b>	<b>30</b>	<b>77</b>
<b>Group 3</b>	<b>188</b>	<b>22</b>	<b>210</b>
<b>Total</b>	<b>281</b>	<b>62</b>	<b>343</b>

As is the case with schools, the total ongoing rental charges of ECU62 million are likely to be surpassed by usage charges incurred. However, more detailed information about the applications which hospitals are likely to support using ISDN 30 is required before it is possible to estimate likely usage charges (the usage charges calculated for schools are based on local calls to the Internet service provider only).

### 5.6.3 Public Libraries

This section contains an estimate of the cost of providing each public library in the three country groups with an ISDN-30 connection. Exhibit 5.15 shows the number of libraries in each country group.

*EXHIBIT 5.15: Public Libraries per Country Group [Source: European Marketing Data and Statistics]*

	<i>Public Libraries</i>
Group 1	993
Group 2	26 216
Group 3	7129
Total	34 338

Exhibit 5.16 shows the connection and rental charges incurred if every library is provided with one ISDN-30 line. However, in addition to access, there is an important issue to be taken into consideration when estimating the cost of ISDN provision to public libraries, namely the charges to be paid for on-line services. In particular, some of these on-line services will replace information sources which are currently free of charge. This

therefore raises questions with regard to library budgets, and additional information is required to assess the likely total usage charges.

*EXHIBIT 5.16: Connection and Rental Charges assuming an ISDN-30 Connection to Each Public Library*

	<i>Connection ECU million</i>	<i>Rental ECU million</i>	<i>Total ECU million</i>
<b>Group 1</b>	37	3	40
<b>Group 2</b>	63	68	131
<b>Group 3</b>	427	47	474
<b>Total</b>	527	118	645

## 5.7 CONCLUSIONS

The implication of the demand scenarios is that in the short and medium term it will not be necessary to include additional services in the definition of universal service (beyond basic telephony and associated services). Basic rate ISDN will not penetrate the residential market beyond the network establishment phase in the foreseeable future. However, it is possible that by 2005 the residential penetration of mobile services will reach the level which would justify their inclusion in universal service. We have estimated that it would cost less than 1% of total mobile revenues to extend universal service in this way. However, this takes no account of how essential mobile telephone services would be to full participation in society. Furthermore, we have not considered the appropriateness of using household penetration to measure the penetration of what is essentially a personal service; it could be argued that penetration of the population would be a more appropriate measure for mobile telephony.

We have also analysed the cost of supplying advanced communication facilities and services to institutional users including schools, hospitals and public libraries. Our analysis shows that the total annualised cost of providing Internet access to schools (including ISDN rental, Internet access and annualised equipment costs over a five-year lifetime) could amount to ECU964 million. Usage charges could account for another ECU 908 million, assuming four hours' use per day

In the medium term, increased Internet access and use of other online services have the potential to increase local call volumes, and the cost of serving uneconomic customers and areas could be reduced by 10% and 20%.



## 6/ Recommendations

### 6.1 INTRODUCTION

This chapter brings together the key elements of the research and makes recommendations as to how the European Commission should proceed in the area of universal service. The major conclusions of the investigation are that:

- the universal service concept is built on a political judgement about the benefits of extending access to particular telecoms services to all members of society rather than just to that element of the population which would enjoy access to the service through the operation of market forces
- universal service should therefore apply to the completion of the roll-out of particular telecoms services.

This understanding of the rationale for universal service underpins the recommendations set out below. The major issues in the short-term are affordability and control of expenditure. With respect to these two issues, we make a number of recommendations which would bring some of the payment procedures and tariff options in the telecoms (PSTN) sector in line with those in other sectors, including the mobile telecoms market. In adopting the stance that universal service is about the completion of the diffusion of a particular telecoms service to all those in a society who demand the service, longer-term issues relating to the extension of the definition of universal service to include new services are embraced within the perspective of market failure and merit goods.

We explicitly reject the view that universal service is primarily concerned with shaping initial users' and producers' choices during the early diffusion of a new technology and development of a self-sustaining market. Where the benefits of new telecoms technologies are contingent on the adoption of other technologies, the strength of the case

for extending universal service to cover these new telecoms technologies is substantially reduced.

The recommendations in the next section should be viewed in the light of the current European Commission definition of universal as “a defined minimum set of services of specified quality which is available to all users independent of their geographic location and, in the light of specific national conditions, at an affordable price”.<sup>1</sup>

## 6.2 RECOMMENDATIONS

Below we discuss 14 recommendations, arranged in two groups. The first group contains our recommendations as to the definition of universal service which should be applied, the frequency with which it should be reviewed, and some related policy issues. The second group of recommendations is concerned with means of increasing the affordability of telecoms services.

### 6.2.1 The Nature of Universal Service

#### *Recommendation 1: The Nature of Universal Service*

Our first recommendation is based on the belief (derived from the interviews) that universal service provision is purely for the purpose of making available particular telecoms services to that minority of potential users who do not have the service and for whom not having access to the service would constitute a social or economic disadvantage, i.e. essential services. For a service to be considered for inclusion within the universal service obligation, the market penetration of that service should be high (see Recommendation 3).

Universal service is only concerned with access to essential services for that minority of potential residential users who want, and have not yet secured, access to the network under normal commercial conditions.

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<sup>1</sup> Common Position (EC) No 34/96 adopted by the Council on 18 June 1996 with a view to adopting Directive 96/ /EC of the European Parliament and of the Council on interconnection in telecommunications with regard to ensuring universal service and interoperability through the application of the principles of open network provision (ONP), OJ C220, 29.7.96

*Recommendation 2: Treatment of Business Customers*

Our second recommendation follows from the first. It explicitly excludes business customers from the protection offered by universal service. This is because business customers are capable of distributing their costs between customers (in terms of price increases), their workforce (changes in the level of wages) and shareholders (through changes in the distribution of profits). The result of explicitly including businesses within a universal service policy framework would be to create a structure which allowed for normal costs incurred by businesses to be subject to some form of subsidy or compensation. Furthermore, universal service should not be used as a mechanism for ensuring delivery of higher quality or specification services to business customers than are available to residential customers.

Universal service should not be used to ensure provision of telecommunications services of higher quality or specification to business customers. The essential requirement that services be affordable applies only to residential customers.

*Recommendation 3: Service Penetration*

Almost all of the organisations we spoke to were opposed to the concept of using universal service as a mechanism to drive the roll out of new technologies and stimulate economic development (e.g. the assertion that basic rate ISDN should be included in universal service in order to speed the diffusion of this service to the population as a whole). The belief that such an approach would lead to inefficient investments and that the costs would be spread over the industry cemented opposition from incumbent TOs, new operators, user associations and consumer associations (development agencies responsible for remote areas of the European Union were the only exception to this).

This position fits well with the principle established in Recommendation 1; the central concerns of universal service are with the provision of essential services to households, rather than with the diffusion of new telecommunications services or regional economic development. By making a recommendation on the level of market penetration which a service should have before it is considered for inclusion in the universal service obligation, a clear trigger point is defined and the rules are transparent and predictable.

Universal service should not be used as a means of initiating the roll-out of new services which have yet to find wide market acceptance. We recommend that for a service to be

considered for inclusion in the universal service obligation it ought to have already grown to a 75% market penetration under normal market conditions.

#### *Recommendation 4: Components of a Basic Telephone Service*

The question of what services should be covered by universal service is critical. The result of applying the principles set out in Recommendation 1 and 3 is that only basic telephone services currently meet the criteria for universal service. However, there is a further question to resolve, namely what constitutes a basic telephone service – clearly access to dial tone is only one of several elements.

- Reasonable quality of service (in terms of speed of connection, speech quality, frequency of failure and time to repair) is essential for reliable use of the telephone.
- Adequate provision of pay phones is essential to ensure that people are able to access the telephone network at all times.
- Free access to emergency services.
- Operator services are essential to cope with customer enquiries.
- Directory enquiry services are essential if customers are to have sufficient information to use the network to full effect.
- Services to deal with complaints regarding malicious calls are necessary because the network provides opportunities for intrusion into peoples' lives and where this occurs it is necessary that action be taken to prevent recurrences. It is likely that the requirement for such a service will diminish as calling line identification becomes available.
- Itemised billing is necessary to provide customers with information about the money spent on telephone services, bringing telecoms into line with almost every other area of commerce, where customers receive details of their expenditure on goods or services.
- Selective call barring is necessary to allow users to prevent access to specific numbers from their telephone. This allows the customer some control over exposure to debt, particularly where the telephone can be accessed by other people.

All of these elements, with the exception of filtering services for malicious calls, are either currently within the scope of universal service as set out in the Voice Telephony Directive (95/62/EC), or are found in the current proposal to amend that Directive (COM(96) 419).

Universal service should be limited for the moment to the provision of basic telecoms services. Basic telecoms services should include basic voice telephony at a defined level of quality (in terms of speed of connection, speech quality, frequency of failure and time to repair), payphones, free access to emergency services, operator services, directory enquiries, malicious call complaints services. Itemised billing and selective call barring should be available to all customers at no additional charge above the basic tariff.

*Recommendation 5: New Technologies*

Public policy can play an important role in the facilitation of the roll-out of new technologies. This is particularly so when the costs and value of the service are not well known: the information superhighway is an example of this. Under such circumstances, a policy on public access – as distinct from a universal service policy – can help to provide initial external support (such as awareness building or pilot projects) to the market.

The initial support of new technologies could be embraced within a policy on public access which would create awareness and stimulate demand for new telecommunications technologies for very limited periods prior to their widespread acceptance by the market. In contrast to universal service policies, public access policies should be characterised by the diversity of the services supported and the limited period of support, and where possible should be achieved through a public-private partnership.

*Recommendation 6: Regulatory Restrictions on Technologies Used*

Restrictions on the use of particular types of technology by operators can force an operator to provide services in a manner which is not the most cost effective. An example of this is the restriction placed on fixed network operators preventing them from using radio technology to carry basic telephony services in sparsely populated areas. Such restrictions increase the cost of universal service and should be removed. This is particularly important if geographical averaging of tariffs is removed, as the costs of such technological restrictions would otherwise fall on the people in the inefficiently served areas.

Where a telecoms operator has an obligation to provide universal service then that operator should be free to offer the service in the most economically efficient manner subject to constraints such as radio spectrum availability.

### *Recommendation 7: Review of Services Covered by Universal Service Obligations*

As noted in Recommendation 1, there are two necessary conditions for a service to be considered universal:

- high market penetration (typically 75% and above) as a proxy measure of network externalities/market failure
- there is a serious economic and social disadvantage from not having access to the service, as an indication of a merit good.

At the moment, the telecoms services which meet these criteria are limited to basic telephony services (Recommendation 4). However, the telecoms market is changing rapidly and it is likely that in the future other services will meet these criteria. The market forecasts conducted in this study concerning the adoption and diffusion of basic rate ISDN and mobile services indicated that it will be ten years before either of these services will meet the first of the above criteria, and then only in certain countries. We therefore do not believe it will be necessary for the services covered by universal service to be reviewed for several years, but by 2005 it is likely that mobile services in particular may well satisfy the market penetration criterion for inclusion within the universal service obligation.

The services which are covered by universal service should be subject to periodic review to assess whether additional services should be added, based on the criteria of market penetration and economic disadvantage.

### **6.2.2 Affordability Issues**

#### *Recommendation 8: Tariff Packages*

Almost all TOs offer residential customers inflexible tariffs in terms of their structure – significant fixed connection and rental charges with call charges added with usage. The size of the connection and rental charges can be significant barriers to taking a telephone service for the less well-off citizen. We therefore recommend that there should be a range of tariff packages available to customers which subsume fixed charges into usage charges,

thus allowing lower fixed and higher usage charges than the standard tariff package. Taken to an extreme, this could mean no fixed charges (or charges at a level which do not represent a barrier to the adoption of network access) and very high call charges: this is already done by mobile operators in some countries as a means of offering customers services intended for use in emergency situations. In addition to the benefit to the consumer, benefits will flow to the incumbent (or those with the USO) from consumers who might otherwise restrict their use of the telephone or may simply not subscribe to the networks.

A wide range of tariff packages which reduce the effect of prices as a barrier to entry for the un-telephoned should be available as a right.

*Recommendation 9: Credit Control vs Deposits*

The practice of charging deposits to new customers and customers with poor payment histories is a significant barrier to take-up of telephone services. It is therefore in the interests of both consumers and suppliers to establish different forms of credit agreements which allow consumers greater control and reduce the levels of risk assumed by the USO supplier.

The telecoms industry should adopt a range of standard forms of credit control used in most other competitive consumer markets, specifically the adoption of finance-based credit limits calculated on the basis of the customer's ability to pay and payment history. Deposits should not be required from customers.

*Recommendation 10: Billing Frequency*

Where a customer's income is weekly (as is the case for many people on low incomes) then budgeting to pay a bill quarterly or every two months can be difficult. Allowing the customer to choose a more frequent billing period will make budgeting for telephone expenses easier for people in this situation.

Customers should be offered the option of being billed at the frequency which is most appropriate for their individual circumstances.

*Recommendation 11: 'Soft' Network Access*

The danger of getting into debt is a deterrent to many people on low incomes causing a lower take-up of telephone services in this group. This could be avoided by making it possible to pay for telephone usage in advance. For example, prepayment for electricity, together with innovative tariff structures and payment schemes, have provided a form of 'soft' access to the network for many customers. With soft access, customers have access to the network at all times but it is the individual consumers who are deciding whether to incur expenditure. With soft access, there is no possibility of bad debt and disconnection from the network ceases to be an issue.

Customers should have the option of soft access to the network through the use of prepayment for telephone usage.

*Recommendation 12: Responses to Non-Payment of Bills*

Currently most TOs disconnect customers who fail to pay for telephone service. Complete disconnection from the network usually follows a recognised procedure of warnings, but some TO procedures are swift and can result in full disconnection from the network in a few weeks. We recommend an alternative, incremental approach. Initial failure to pay could result in outgoing calls being barred. Further failure to resolve a debt could result in all calls being barred except outgoing calls to emergency services and healthcare services. However, the final sanction of complete disconnection from the network should not be removed from telephone companies.

'Soft' disconnection should be the initial stage for the removal of service from a customer for non payment of a bill. Soft disconnection should be implemented for the billing period after that which a debt has been incurred.

*Recommendation 13: Disabled Users*

People with certain disabilities may have difficulty in using the standard telephone service:

- People with speech and hearing difficulties may require access to a teletype service in order to use the telephone. The required terminal equipment for this type of service is



relatively expensive. In addition, the time required to communicate via a teletype service is longer than an equivalent spoken exchange.

- People with visual impairments may be unable to use paper-based directories (which are typically provided free of charge) and thus are forced to use directory enquiry services, for which a charge is frequently made.

Universal service should compensate disabled users for the additional costs imposed on their use of the telephone service by their disability. This recommendation should be supported by the monitoring and dissemination of best practice within the EU.

#### *Recommendation 14: Public Access*

In the debate over the development of an Information Society it is frequently argued that special consideration should be given to access to new 'broadband' services for schools and other public institutions. Discussion has focused on the provision of ISDN services to schools and hospitals. This may be a laudable aim, but has little to do with designing and implementing a universal service policy. Public access policies are best seen as encouraging the initial adoption of new services and their rapid diffusion. They should therefore be seen as a market facilitator, not a means of addressing issues of market failure. As such, public access policies should support a variety of technologies and services and, importantly, only support any one initiative for a limited period. The aim is to encourage the take-up of services in the initial stage of market development, not to shape the roll-out of a particular technology.

One issue highlighted by public access policies is the explicit linkage between telecoms policy and other policy domains. An example of this is the support provided in education policies (and budgets) for related but necessary activities, particularly the provision of IT resources (hardware and software) and ongoing technical and training support. The provision of ISDN to schools and hospitals is not achieved through the simple supply of technical infrastructure.

Public access policies targeted at providing new services to schools and hospitals are not part of a broader universal service policy debate and as such should have distinct characteristics; in particular, such policies should encourage a diversity of technical and service offerings and be relatively short-lived.

## Annex A/ Study Contacts

We provide below a full list of the organisations contacted in the course of this study.

### *National Regulatory Authorities*

- Bundesministerium für Öffentliche Wirtschaft und Verkehr (A)
- IBPT (B)
- Bundesministerium für Post und Telekommunikation (D)
- Ministry of Transport and Communications (SF)
- Direction Générale des Postes et Télécommunication (F)
- Ministry of Telecommunications & Transportation (GR)
- Department of Transport Energy and Communications (IRL)
- Administration des Postes et Telecommunications (L)
- Ministero delle Poste e delle Telecomunicazione (I)
- Ministry of Transport and Public Works (NL)
- Instituto das Comunicacoes de Portugal (P)
- Ministerio de Fomento (E)
- Posts & Telestyrelsen (S)
- OFTEL (UK)
- Ministry of Posts and Telecommunications (PO)
- Ministry of Economy (CZ)
- Ministry of Transport, Communication and Water Management (H)
- Ministry of Communications (R)
- Austel (Aus)
- Ministry of Commerce (NZ)
- Federal Communications Commission (USA)

### *Incumbent TOs*

- Ameritech (USA)
- BT (UK)

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- France Telecom (F)
  - GTE (USA)
  - SPT (CZ)
  - Tele Danmark (DK)
  - Telefónica (E)
  - Telia (S)
- Competitive Operators*
- Cable Communications Association (UK)
  - COLT (UK)
  - Mercury Communications Ltd (UK)
  - MFS (UK)
  - Tele2 (S)
  - Teleport (USA)
- User Associations*
- INTUG
  - ECTUA
  - TMA (UK)
  - AFUTT (F)
  - Beltug-TMAB (B)
  - BTG (NL)
  - Deutsche Telekom eV (D)
- Trade Unions and Social Organisations*
- COST 219
  - ETUC
  - Federation des Metallurgists
  - Federation des Journalists
  - Deutsche Postgewerkschaft (D)
  - Confederation des Syndicats Chretiens (B)
  - SUD – Federation Syndicale des PTT (F)
  - Communications Workers Union (UK)
  - Eurofedop
  - IPTT
  - Fondation Charles Leopold Mayer pour le Progrès de l’Homme
  - Telecommunications Action Group
- Consumer Associations*
- Consumenten Bond (NL)
  - Consumers Association (UK)
  - Consumer Association of Ireland (IRL)
  - Finnish Consumers Association (SF)

- Konsumentombudsmannen (S)
- Consumer Federation of America (USA)
- BEUC
- Ministry of Consumer Affairs (NZ)

*Development  
Agencies and  
Banks*

- Highlands and Islands Enterprise (UK)
- Udarás na Gaeltachta (IRL)
- Welsh Development Agency (UK)
- Almi Foretagspartner (S)
- Kemi-Tornio Regional Development Agency (SF)
- EBRD
- EIB
- Eurada
- Czech Invest (CZ)
- ITB Hungary (H)

*Players in Other  
Sectors*

- OFFER (UK)
- OFWAT (UK)
- OFGAS (UK)
- Lyonnaise des Eaux (F)
- Gas & Fuel (AUS)
- Australia Post (AUS)
- Victoria Regulator General (AUS)
- Ministry of Commerce (NZ)

## Annex B/ Funding Universal Service

The material in this annex is taken from Analysys's recent publication *1998, A New Era for EU Telecoms Regulation*,<sup>1</sup> and provides an overview of the two main current proposals for funding universal service.

On the question of how universal service should be funded, the Commission's proposals are fairly open, allowing NRAs flexibility in deciding the most appropriate mechanism. The approaches outlined in the Interconnection Directive would ensure that:

- Member States have the freedom to fund all or part of any burden through state budgets, within the limits permitted by EU law, but this is unlikely to happen in the current economic climate.
- NRAs may choose not to set up any mechanism where the cost of universal service is either negligible or zero.
- where the cost of any burden is to be shared among market players, this may be achieved either through a system of additional, but separate, supplementary charges on interconnection, or through a national universal service fund. These two options are discussed below.

Adding supplementary charges to interconnection charges has the advantage that it does not require new structures to be created, is less costly and is easy to administer. However, there are serious shortcomings. Firstly, there is a conflict of interest because the dominant operator will be collecting subsidies from its competitors to cover some of its costs; consequently, there is no incentive for the dominant operator to reduce its costs in providing universal service. Secondly, because the mechanism is based on the TO's calculation of its costs, there is a lack of transparency and the possibility that such charges

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<sup>1</sup> Blackman, C., and Denmead, M., *1998, A New Era for EU Telecoms Regulation*, Analysys Publications (January 1996).

might be contributing to the TO's profits rather than offsetting costs. Thirdly, it assumes that only dominant operators have universal service obligations; new entrants therefore have no incentive to compete in high-cost areas and the benefits of competition will favour business rather than domestic users.

The Commission's favoured approach is a universal service fund mechanism, which is considered to be the most transparent method. Contributions to such funds could be calculated in a number of ways, for example on the basis of market share, gross profits or net transmission revenues. Although such a mechanism is more cumbersome and expensive to set up, it would not lead to the distortions described above. The experience in the UK, where universal service has become muddled by the debate over access charges, seems to have been taken on board by the Commission, but not necessarily by all the Member States. In the recent French public consultation document, for instance, a hybrid of the two methods is proposed.<sup>2</sup>

The assumption that provision of universal service is necessarily a burden is being challenged: the costs are considerably lower than were previously supposed; and so-called uneconomic customers receive telephone calls and may become the economic customers of tomorrow. While the incumbent TO will retain its universal service obligation, in areas where alternative infrastructure is available the incumbent's current obligation could be replaced by a system of regional franchises. Other operators could have the right to take on the universal service obligation, waiving their contribution to a universal service fund – so-called 'pay or play'. New operators could be given a choice of either reimbursing a proportion of the incumbent's universal service costs, or of providing universal service in that nominated area. The payments for providing universal service would potentially be available to all operators. Pay or play may, therefore, prove attractive to new entrants.

Nevertheless, there are likely to be areas or groups of subscribers which all operators consider to be uneconomic. In such cases the universal service obligation should be opened to competitive tendering with the responsibility being allocated to the bidder who meets acceptable levels of quality and requires the lowest public subsidy. As a last resort, a subsidy will be paid to the incumbent TO to provide universal service.

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<sup>2</sup> Ministère des Technologies de l'Information et de la Poste (1995).

## Annex C/

### Review of the Literature on Universal Service

The purpose of this literature review is to consider some of the alternative positions that have been adopted in the analysis of universal service, and to identify the foundations on which the development of universal service policy can be based. This annex seeks to set out the different perspectives on universal service which lead to often ambiguous, if not conflicting universal service policy objectives.

This literature review is divided into three sections. Section C1 presents a brief discussion of the origins of the concept of universal service and its inherent ambiguity. Section C2 sets out two contrasting perspectives on the conceptual underpinnings of universal service, namely a political economy viewpoint and one concerned with economic efficiency and network externalities. Section C3 is concerned with the general issues of affordability. This section is sub-divided, the first sub-section discusses universal service and welfare impacts of tariff rebalancing, the second sub-section discusses the ‘untelephoned’ and the reasons why individuals do not have access to the telephone. Finally, in Section C4 some of the key threads from this review are drawn together in a summary organised around the themes of affordability and the extension of the concept of universal service to include services other than telephony.

#### **C1/ BACKGROUND**

In terms of the obligations which are imposed on the telecoms sector by political processes, it is similar to many other industries. The activities of many enterprises are shaped by policy objectives (social, developmental or industrial) which impose obligations that may or may not coincide with narrow ‘commercial’ objectives. These obligations are variously called ‘social objectives’, ‘public service obligations’, or ‘community service

obligations'. Whatever the terminology used, the policy typically has one of two intentions: either to make a service or product widely available at uniform prices, or to implement welfare or redistributive policies by granting price concessions to specific groups of users.<sup>1</sup> However, such obligations often lead to confusing and ambiguous definitions of key policy objectives precisely because they are based on non-commercial criteria.

The inherently ambiguous definition of universal service allows the policy debate to be continually re-interpreted by various actors in the political economy. In 1987, the OECD commented on the problems which may result from an ambiguous specification of the government objectives imposed on those companies with a universal service obligation:

“There is extensive empirical evidence that the objectives public enterprises are expected to pursue are often poorly set out, and that even when set out, they are extensively altered and reinterpreted through political processes of negotiation; while this may be useful in some circumstances, it frequently gives rise to inconsistent requirements being placed upon the enterprise [...] unclear and conflicting objectives make performance difficult to define and monitor and compound the problems created by the lack of any ongoing external assessment. In some cases, this leads to public enterprises being subject to little effective control or to detailed administrative requirements aimed at ex-ante supervision of procedures and decisions [...] Overall, the problems of public enterprise arise partly from the fact that the ‘regulatory contract’ between the State and a publicly owned operator of a public utility is a highly implicit one, where the primary guarantee given to consumers is often a purely negative one – monopoly profits will not be maximised.”<sup>2</sup>

This re-interpretation of the concept of universal service is well illustrated in the telecoms sector. In the early part of this century, the telecoms industry worldwide underwent a period of massive restructuring which typically reduced the sector in each country to a monopoly structure. Milton Mueller (1995)<sup>3</sup> has argued that the basic policy confusion surrounding universal service in the telecoms sector arose because the concept was developed as a marketing strategy in 1927 by Theodore Vail, the first Chairman of ATT,

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<sup>1</sup> In addition, policy objectives could be associated with cultural integrity or diversity, concepts of the nation and national identity.

<sup>2</sup> OECD/ICCP (1995), *Universal Service Obligations in a Competitive Telecommunications Environment*, No. 38, Paris. The quote is originally from OECD (1987), *Trends of Change in Telecommunications Policy*, ICCP Series 13, Paris (p.305-306).

<sup>3</sup> Mueller, M., (1995), “Universal Service as an Appropriability Problem: a new framework for analysis”, in Brock, G., (1995), *Towards a Competitive Telecommunication Industry: selected papers from the 1994 Telecommunications Policy Research Conference* (Lawrence Erlbaum & Associates).



in order to legitimate the dominant (and subsequently monopolistic) market position being developed by AT&T in the earlier part of this century.

However, in contrast to this view that universal service has served the interests of the dominant carriers is the view that a universal service obligation forces a company to undertake operations that it otherwise would not undertake in competitive environment, and therefore is eligible for some form of compensation.

In an environment where the single telecoms service (telephony) was provided by a single supplier, universal service was an elegant policy instrument that brought together the two elements of equity and efficiency. In effect, substantial network externalities were being realised and monopoly rents were redistributed through the geographical averaging of prices.

However, in the context of a multi-vendor, multi-service telecoms environment, this policy elegance has been brought into question. In a competitive market the interaction of supply and demand will ensure the appropriate delivery of services, but from the perspective of an Information Society the ubiquitous provision of services is axiomatic to a cohesive society. These inherent tensions in the debate about universal service are discussed at greater length in Section C2.

## C2/ CONCEPTUAL UNDERPINNINGS OF UNIVERSAL SERVICE

This section discusses two broadly-based perspectives which underlie the discussion of conceptual frameworks for universal service policy:

- the first seeks to locate the availability, quality and cost of telecoms services as part of broader **political economy**, with questions of social, economic and political equity
- the second focuses on the questions of **efficiency and network externalities** associated with the provision of telecoms services “that are supplied to customers or groups of customers at a loss when the firm supplying them is operating efficiently and its past investments have been based upon sound business decisions”.<sup>4</sup>

This bifurcation is used to discuss the literature and the debates on two basic issues:

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<sup>4</sup> Cave, M., Milne, C., and Scanlan, M., (1994), *Meeting Universal Service Obligations in a Competitive Environment* (ONP-CCP(95). March 1994 report to DGIV (CEC).

- What is the basis of universal service?
- How can the definition of universal be extended?

### **C2.1 A Political Economy Perspective**

The key concern underlying the political economy perspective is *equity*. Given that the combined effects of the shift towards an Information Society and the ability of telecoms networks to reconfigure geographical patterns of economic activity, questions over equity in the provision of telecoms services have been thrown into stark relief.

The Information Society is transforming the nature of work, work organisation and the structure of organisations. It is bringing about new debates over the delivery of education and training, health care services and the nature of culture in our society, and is focusing on new concerns about the nature and delivery of democracy. At its most fundamental, the emergence of the Information Society is transforming the underlying basis of production, with a move away from manufacture towards information activities.

Within the context of the European Union the Commission White Paper on *Growth, Competitiveness and Employment* and the Bangemann Report underlined the importance of both the Information Society to the future prospects of the European economy and the importance of the social dimension. The DGV High Level Expert Group<sup>5</sup> has used this social perspective to argue for a redefinition of the nature of universal service in the provision of telecoms and, significantly, to argue for “an active rather than passive concept of solidarity”. The concern of this High Level Expert Group is that, for example in the case of employment within an Information Society, that “the combined effect of such distributional impacts, and the growing international transparency of markets, will put the burden of adjustment even more on the unskilled labour and low wage parts of the labour force” (*op. cit.* p.v). Such a position has widespread implications for cohesion – both within families, and within the labour market between different cultural groups and regions within the EU.

From deep-seated concern about an equitable, fair and just society flows an argument which concludes that policy should be directed towards “an approach to access to information which goes beyond conventional ideas about universal service provision

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<sup>5</sup> *Building the European Information Society for Us All*, High Level Expert Group, Interim Report to EC DGV, January 1996 (p.ii).

(USP)” (High Level Expert Group, *op. cit.* p.ii). Thus the High Level Expert Group concludes that there are a number of inter-related steps:

- “• There is a need to develop much more focused and targeted approaches to infrastructure support. Following this perspective, Community Structural Funds could be directed in ways which are much more sensitive to emerging demand, and thus more effective and efficient.
- Any reformulation of USP has to take into account new technological possibilities and be accepted by all countries in the European Union. The problem is how to define a level of access which is adequate (especially given the proliferation of media), which will have some long term viability, and which will be good for all regions, and so any programmes and policies adopted should be attuned to variations which exist.
- Broader measures are needed, however, which can ensure that different social groups (e.g. residential, schools, hospitals, small enterprises, public services) gain access to a reasonable service level at a reasonable price.
- Satisfying demand for telecommunications services is as important as investment in infrastructure and services. Critically important is the modernisation of enterprises and the public sector, and the development of human resources to increase the development impact of information and communications technologies.
- Regional institutions, such as chambers of commerce, regional innovation centres, collaboration between regional government, training institutes and enterprises, are important to the innovativeness of the region and its capacity to respond to the challenges of the Information Society. In least-favoured regions, they are often thinly developed, rigid and not up-to-date, or not well-integrated.” (p.x).

Discussions over regional cohesion and the centrality of the universal delivery of telecoms services have two strands. The first strand is concerned with maintaining, as a minimum, the relative position of the regions. There is a concern about two issues: the regions’ ability to capture activities which have become ‘footloose’ with the advent of information and communications technologies and to create an environment which can attract new mobile activities. The second strand is a concern with ‘catching up’ and ‘leapfrogging’. As argued by the High Level Expert Group (*op. cit.*):

“There is a need to investigate in much greater detail whether in order to avoid exclusion and preserve regional cohesion, the current notion of universal services should not be

shifted in the direction of a notion of “universal community service”, extending universal service provision to incorporate a basic level of access to new information services (functionally rather than technically defined so therefore articulated, for example as, electronic networking, data and mail exchange, access to new business and information services available world-wide and in core regions etc.), but limited in its universality obligations to educational, cultural, medical, social or economic institutions of local communities. Such a community USP concept would in effect mean a return to the historical notion of “universality” as introduced last century in the US with the advent of the telegraph. It would guarantee open access to the network and the carrier services and involve, where necessary, public funding for technical and financial assistance.

“This proposed limitation of USP does not imply that we consider the availability of modern information infrastructure to be of less importance for regional development. On the contrary, connectivity has become a precondition for any regional development today [...]” (pp.41/2)

Similar arguments exist in other documents which seek to define the delivery of universal service within the structure of the Information Society. In Canada there is an argument which says that although the issues of affordable and equitable access to the Information Highway are not new, the notion of convergence which is inextricably interwoven into the fabric of the Information Society requires the rethinking of old concepts. In a report prepared for the Canadian Information Highway Advisory Council Secretariat, Gilbert *et al*<sup>6</sup> argue that “societal responsiveness is the fundamental criteria for defining a universal service” (p.2). The underlying assumptive framework for this report is the 1994 Communications Act which defines universal service in terms of a public interest debate. The public interest objectives include “to ensure that every person has access to reasonably evolving telecommunications services at just, reasonable, and affordable rates taking into account advances in telecommunications and information technology” (Canadian Communications Act 1994).

Once a service has been designated as meeting a societal need it must, to be universal, be accessible and affordable to *everyone*. This suggests that public networks must be immediately accessible to all users without impediment, and content must be free to flow to the user wherever he or she is located.

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<sup>6</sup> Gilbert, J., Hepburn, K., Henter, G. (1995), *Affordable and Equitable Access to the Information Highway*, Final Report, Information Highway Advisory Council Secretariat (Ottawa, Canada).

Gilbert *et al* develop their argument by suggesting that not many services will meet the full criteria for universal service, but that a wide range of services might be required for a more limited cross-section of society, e.g. telecoms services in support of education in remote and rural communities. The authors call these 'requisite' services. They define these as "those services that meet the requirements of a sector or a special constituency which has itself a major impact on society as a whole" Such services cannot be guaranteed to everyone but public policy could "ensure that they are available to those who need them at just and reasonable rates" (p.2). In this discussion the authors seeks to post the notions of 'universal accessibility' and 'affordability' to universal service and the notions of 'equitable access' and 'just and reasonable rates' to requisite services.

Having made this distinction the authors then argue that "enhanced telecommunications services are unlikely to qualify as universal services without a period of evolution in the market place. However, they can be of vital concern to certain sectors and may qualify as a requisite service." The authors implicitly recognise that market share, as a measure of the diffusion of a new service and its societal value, is the key factor which determines whether a service should be included within the universal service obligation.

In an Information Society, the political economy arguments about the evolution of the definition of universal service implicitly involve the universal diffusion of information and communication technology. The universal service provision of telecoms services is seen as a way of fostering the diffusion of information and communication technology and thus of shaping a more even distribution of economic activity across the economy.

In essence these political economy perspectives support a 'public good' model for the development of universal service. However, as commented by Cave *et al*, "the rationale behind the public good model is the belief that beneficial externalities and intangible benefits associated with telephone services warrant a social cost benefit analysis to telecommunications [...] the public good model is linked to government social policy. In its pure form a public good model acts as a surrogate for market place forces such that infrastructure investments which are judged to be in the "public interest" are mandated by regulators" (p.22). In essence such a view requires the regulator to 'pick winners'. However, where there is a wide choice of immature technological and service options and the perceived utility function is not well defined, there is great scope for poor judgements.

The **policy implications** of this political economy perspective are manifold. At its most fundamental, however, this perspective requires a policy of universal service that pre-empts market-based solutions and thus provides a clear framework for the diffusion of new technologies and services. In the current context this perspective would lead to the

inclusion of ISDN services in a universal service obligation. The political economy perspective also provides a relatively complex decision-making process for universal service in which weight is given to a complex array of factors (e.g. the cohesion of regions and the integration of the 'information poor' with the broader economy). A policy formulated from this political economy perspective is effectively seeking to redress imbalances in the diffusion of technology and the interactions within a market before they occur.

## **C2.2 Economic Efficiency and Network Externalities**

In contrast to the political economy arguments, the debate about universal service within the framework of 'efficiency' involves a narrower set of issues, in particular how universal service obligations force particular actions and behaviour on a company that it would not otherwise undertake, and an assessment of the consequences of those actions for other suppliers in the marketplace. As a result, the efficiency debate has sought both to define the scope of activities which would not otherwise be undertaken and to measure the costs and benefits of such activities.

The measurement of the costs and benefits of universal service has been an exercise conducted in many countries and a preliminary study for EU12 Member States was undertaken by Analysys for the Bangemann Group.<sup>7</sup> The general conclusion of these costing studies suggest that the costs of universal service obligations appear to be relatively low when set against the total turnover of the incumbent operator. In those countries where there has been a reasonable degree of tariff rebalancing, and so it is possible to make a more accurate calculation of costs and revenues, the cost of universal service obligations is between 1% and 2% of turnover.

An important element of the costing studies which have been undertaken is the distribution of costs between uneconomic customers and uneconomic areas. In some countries, such as the UK, costs are distributed relatively evenly between these two elements. Thus the argument from some regional groups that universal service obligations are solely a question of peripherality are not necessarily supported by universal service costings. It should be noted that the calculation of net cost is heavily dependent on the values attributed to the benefits of being the holder of the universal service obligation. However, one consequence of these costing studies has been to clearly separate universal

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<sup>7</sup> *Provision of Quantitative Data as Background Material for the Bangemann Group*, Analysys Final Report, 18 May 1994.

service from the debate over access deficits. If the cost of the universal service obligation is relatively low, it is not unreasonable to require the dominant carrier to absorb these costs.

A central argument in the economic efficiency debate is that the market would not provide telecoms services efficiently. Privately assessed utility functions would result in lower consumption than if a universal service obligation was in place; in essence, individuals and producers would not take full account of the benefits of network externalities. Where such network externalities exist then even if services were provided without distortions (such as regulatory action or monopolistic market structure), a market would not deliver the optimum solution. In such circumstances, market failure is said to exist, and the policy question is therefore how to incorporate pricing signals that will allow individuals' decisions to mimic what would have happened in the absence of market failure.<sup>8</sup> This debate involves an assumption that telecoms services can be seen as a merit good, i.e. a good more of which the government decides should be produced than people would choose to consume left to themselves.

There are two major features of externalities in the telecoms industry:

- **call externalities**, the asymmetry between costs and tariffs which arises because incoming calls are received free of charge
- **network externalities**, changes in the engineering efficiency and use value to existing users when another user joins the network.

Building on these perspectives Cave *et al* argue that universal service can be seen as embracing at least four different policy objectives:

- achieving universal geographical coverage
- offering residential services at geographically averaged prices
- pursuing universal access through widely subsidised residential access
- offering targeted telephone subsidies.

The authors argue that there are four overlapping stages in the development of universal service which have several common characteristics. They present the four stages (illustrated in Table C1) rather hesitantly: "we describe some of these characteristics in broad and deliberately over-simplified terms" (p.23).

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<sup>8</sup> For a discussion of these issues see for example Cave *et al*, *op. cit.*, or Capello, R. (1994).

**TABLE C1:** *Four Stages of Universal Service [Source: Cave et al]<sup>9</sup>*

	<i>Stage 1: Network establishment</i>	<i>Stage 2: Wide Geographic Reach</i>	<i>Stage 3: Mass Market Takeup</i>	<i>Stage 4: Network Completion</i>
Notional business penetration	0-30%	20-80%	70-100%	100%
Notional residential penetration	0-10%	5-30%	20-85%	75-100%
Telephone company culture	entrepreneurial	administrative (government department)	operational (huge workforce)	commercial (may be privatised)
Management preoccupations	large scale capital investment in new technology	technical network improvements, public service	growing the network, investment in new technology	growing call revenues marketing

**TABLE C1:** *Four Stages of Universal Service (continued)*

	<i>Stage 1: Network establishment</i>	<i>Stage 2: Wide Geographic Reach</i>	<i>Stage 3: Mass Market Takeup</i>	<i>Stage 4: Network Completion</i>
Constraints to network expansion	investment funds, appropriate technology and skills	limited demand due to high cost and prevalence of alternative communication methods	manpower for plant installation to meet mass demand (waiting lists)	affordability of service to poorer households; cultural acceptability of telephony
Typical government policy measures	investment incentives	close government control for security and economic reasons; geographically uniform charges	installation and rental charges kept low to stimulate line demand	cost oriented tariffs, targeted subsidies
Universal service goals	primarily technological (acquire new technology) provide long distance service linking all major centres provide public telephones where demand warrants	primarily geographic (maintain regional parity) make telephone service available in all population centres; wide-spread adoption of telephony in business	primarily economic (stimulate economy) widespread residential take-up of telephony; meet all reasonable demands for telecoms	primarily social (achieve political cohesion) telephone affordable to all; telephone service adaptable to special needs (e.g. of disabled people)

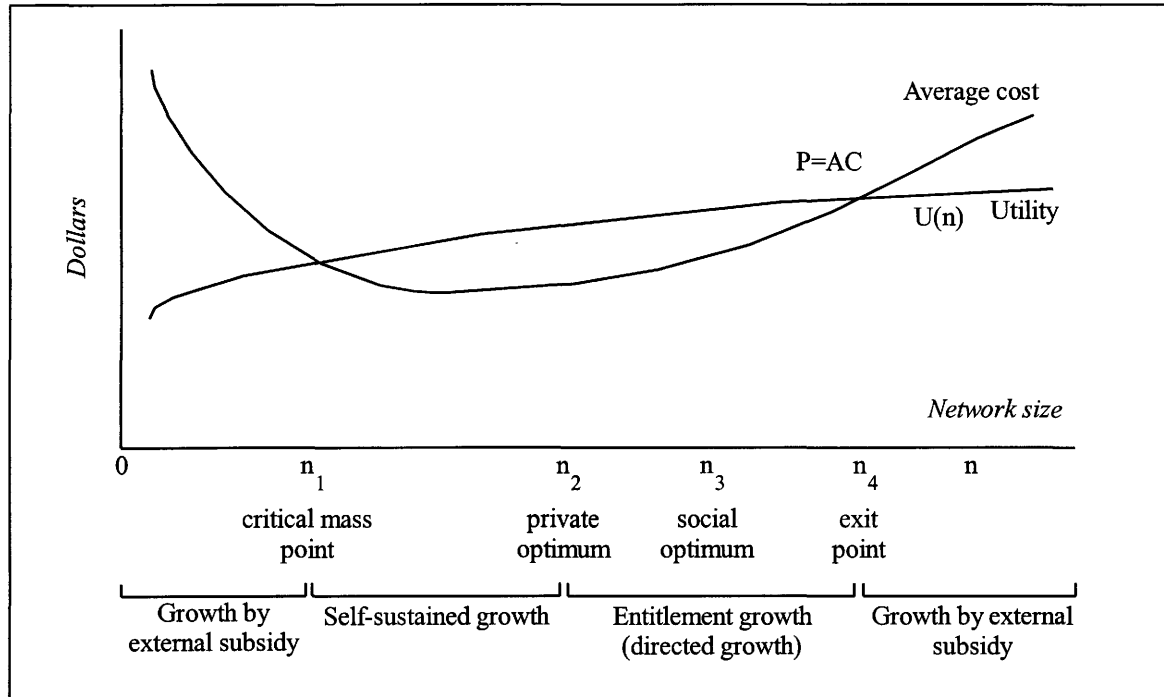
<sup>9</sup> Cave et al, op. cit. Reproduced with the kind permission of the Commission.



In conclusion, Cave *et al* argue that they have set out a “general framework for thinking about the evolution of universal service goals [...] At the stage of mass market take-up the main goal is economic, to stimulate the economy. Externalities are large. At the stage of network completion, the main aim is social. In the former states access charges may need to be kept low. In the latter, targeted subsidies are appropriate” (p.25).

However, Cave *et al* are prepared to accept the notion of universal service as all-embracing in terms of technological, economic, social and regional objectives, and so they do not necessarily provide a consistent framework within which these policy objectives can be delineated. What appears to be needed is the ability to distinguish between universal service policy (which concerns the ultimate roll-out of technology and the protection of the interests of consumers who are disadvantaged as a result of the complete diffusion of a technology across a population), and a policy which facilitates the roll-out of new technologies and gives consumers and investors a better understanding of the utilities and costs associated with new services. The unbundling of these two elements which have until now been inextricably interlinked with universal service provides a way to develop distinct policies. An initial framework for this can be derived from the work of Eli Noam. This framework is set out in Exhibit C1 below.

**EXHIBIT C1:** *Average Cost and Utility of a Telecoms Network, Plotted Against Increasing Numbers of Subscribers [Source: Noam, 1994]*



Eli Noam (1994)<sup>10</sup> provides a framework for analysing universal service which can be used to bridge the conflicting positions of the private good and public good models. This framework, which is described below, can be used to clearly distinguish the policy initiative of 'public access' from the concerns of a universal service policy. We argue that these two policies are different and that it is wrong to present them as a continuum. In essence, universal service concerns the completion of a network where the costs are known and the utility function is well defined. Public access is a policy measure which can be seen to have value in directly contrasting situations, where the utility curve is not well known and the shape of the cost curve is unclear.

The definition of universal service offered by Noam is articulated in terms of a public policy objective to spread telecoms to most members of society and to make available the necessary funds, either directly or indirectly. Noam comments that "competitive inroads into segments of telecommunications have limited the ability to generate funds for such internal cross-subsidies. Since the demands for funds for maintaining universal service have not declined, the old system has been propped up with great complexity" (p.687/8).

<sup>10</sup> Noam, E., (1994), "Beyond Liberalization III: reforming Universal Service", *Telecommunications Policy* 18(9) pps 687-704.

The basis of the framework offered by Noam is set out in Exhibit C1 above. The underlying assumption of the framework is that costs are shared equally by all network members, in which case four stages of network growth can be identified. The first and last of these are fuelled by external subsidy, while the middle two stages are propelled initially by self-sustained growth and then by entitlement (directed) growth. These four stages of growth are delineated by the achievement of specific network characteristics:

- **critical mass**, the point at which the private assessment of utility fuels the growth of the network
- **private optimum**, the point at which average costs begin to increase, utility reaches a plateau, and marginal average net benefits are zero
- **social optimum**, the point at which a societal view of the economic optimum is reached
- **exit point**, the point at which the average cost outweighs the utility and the advantages of joining an alternative but interconnected network.

The ability of customers to move from one network to another and still enjoy the benefits of the larger, incumbent operator's, network puts the issue of interconnection at the heart of the debate about the development of competitive markets. Given that within a single large network there are substantial redistributions brought about by basing tariffs on averaged costs, customers have a substantial incentive to migrate to an interconnected network, particularly if they still enjoy the benefits of network externalities without being subject to the redistribution burden. The tension created by this outcome of regulatory and pricing policy explains why interconnection is the main battleground between new entrants and incumbent operators. If the transfer of customers from one network becomes particularly strong then the first network moves close to 'tipping', and as a consequence an additional network is created. As observed by Noam, "thus a redistributory universal policy is connected to a market structure policy, so when the latter changes, the former must adjust too."(p.691).

In defining those services which should be included in the universal service obligation Noam makes the following observations:

"It is for those services which

- have reached, through self sustained growth, a private optimum, beyond which further growth is not internally generated because marginal average net benefits are zero, but where
- average net benefits are positive (and therefore encourage demand for entry), and
- the number of those excluded is sufficiently large to lead to an opening by political means.” (p.689)

As is clear from the analysis the extension of universal service is related to the completion of the roll-out of a technology, and the key measure of this appears to be market share. Universal service therefore applies in those conditions where the utility and costs of service are known (on Exhibit C1, those circumstances which lie to the right of the private optimum). Conversely, public access applies to those points to the left of the ‘critical mass’ transition point.

An alternative view is put forward by Milton Mueller. Mueller (1995)<sup>11</sup> argues that a public finance perspective is typically used to interpret the universal service problem. He cites the following to demonstrate the key issues surrounding the current debate on universal service:

“The current system of affordable and widely adopted telephone service is based upon rate averaging and cross subsidies among routes, users and locations. Competing networks undermine this support system because they are able to undercut the incumbents’ prices in routes and services that are generating surpluses, while benefiting from access to areas controlled by the incumbent. This “cream skimming competition” will inexorably lead to unbundling of routes and services of the public network, and a deaveraging of the rates associated with each service component. As this happens, many end users, forced to bear the “full cost” of their particular network components, will not be able to afford it. So how will the subsidy system be maintained in the new, competitive environment.”

Therefore, within this public finance framework the key issue is to identify the most efficient and equitable mechanisms for generating and distributing the subsidies needed to finance uneconomic use of the telecoms infrastructure. However, Mueller argues that an alternative framework is available, namely to use theories of property rights and recast the universal service debate as a problem of *appropriability*. In essence Mueller argues that telecoms firms should be able to adopt pricing policies and control access to their products in a way which allows them to capture the full economic value. Mueller argues that “most

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<sup>11</sup> See Mueller, M., (1995).

of the alleged incompatibility between universal service and competition is a predictable result of a property structure that does not allow telecommunication networks to benefit from increasing their scope. With the right property structure, universality ceases to be a costly liability and instead becomes a valuable asset.” (p.2).

Mueller offers four major critiques of the prevailing view:

- the underlying assumption is that a universal telecoms network is a costly liability and carriers receive no competitive advantage by enlarging its scope
- there is no way of distinguishing between high-cost and inefficient ways of operating in a subsidy-based environment
- universal service subsidies are incompatible with a free, open and competitive marketplace
- subsidy requires the government to define the nature of basic service rather than the market.

A central feature of Mueller’s argument is the absence of a property structure in public telecoms networks. Where networks are interconnected a supplier can provide access to the whole system regardless of the scope of individual networks, thus smaller firms enjoy a substantial range of benefits without the costs or risks involved in creating the entire system.

Mueller draws a parallel with the problem of intellectual property in information markets, pointing up the distinction between the costs of producing information and the costs of reproducing information: “[...] a competing network provider who purchases access to the established telephone network for its customers is physically enabled to resell access to all of the users of the latter system. Just as the information reseller need not worry about the costs of producing information but only the cost of reproducing it, so the telephone access reseller need not worry about the cost of reconstructing the established network, but only the cost of acquiring access into it to handle the traffic between the two systems” (p.6). Moreover, Mueller argues that telephone access is not a homogenous good, each user and each group of subscribers is unique.

Mueller argues that a number of implications arise if the issue of universal service is considered from the perspective of appropriability:

- The primary resource which is sold by a telephone network is access to subscribers, not simply a set of physical facilities and functions. Moreover, it is the size of the access bundle offered by a network that increases its value.

- The price of access should be based on the market value of access, not just on the cost of physical facilities required to provide it.
- The problem of appropriability makes it necessary and legitimate for owners of information resources to vary the prices charged for access depending on whether or not the user intends to resell it.

In conclusion, Mueller argues that competition and network universality can be reconciled if the telecoms industry adopts a property structure that allows networks to appropriate the increasing value generated when their scope is enlarged. Given that this is not possible in the current regime, Mueller comments that: “it is not surprising that the growth of competition seems to corrode the economic foundations of universal services” (p.10).

From a **policy perspective** the economic efficiency viewpoint paves the way for three interrelated sets of initiatives:

- the design and implementation of public access policies. Such policies are particularly important where the costs of provision and the utilities of consumption are not well known and thus sub-optimal decisions may be taken which would slow down the introduction and diffusion of new services.
- universal service policies based on the argument that under pure market conditions individual decisions do not result in sub-optimum development of the network because they do not take full account of network externalities.
- a universal service policy which addresses the diffusion of services to those relatively few households which are unable to afford the service under normal market conditions. This policy of network completion seeks to rectify the behaviour of the market in the light of actual rather than anticipated behaviour.

### **C3/ UNIVERSAL SERVICE AND AFFORDABILITY**

Inextricably interwoven with the debate on universal service are the related issues of tariff structures and affordability. This section addresses these two issues by looking at the welfare implications associated with tariff rebalancing (towards cost causative models as anticipated by the ONP framework) and then reviewing the limited literature available on the ‘untelephoned’. Here the issue of affordability is best interpreted in terms of controllability; the evidence suggests that it is not the costs of calls which are the greatest

deterrent to use of the telephone network but rather the lack of control over expenditure in those households which have to budget all items of expenditure very carefully.

### C3.1 Estimation of Welfare Implications of Tariff Rebalancing

In the process of tariff rebalancing, which is inextricably interwoven with the emergence of competitive markets and the implementation of ONP rules, there is a debate about the distribution of changes in individual welfare.<sup>12</sup> Even if it can be shown that the distributional effects of liberalisation are Pareto optimum, they may still be regarded as unacceptable by some groups of consumers. In his work on the perceptions of economic justice, Zajac argues that economic welfare analysis ignores the behaviour and values of individuals. He argues that individuals, in their economic and social judgements, use different criteria of mutual material self-interest and of equity from those used by welfare economists. Even if it could be shown that everyone would benefit from a redistribution of welfare this would not necessarily be regarded as equitable since the overall social distribution of welfare benefits may be considered to be as important, if not more important, than the absolute level.

In early work, Perl (1986)<sup>13</sup> argued that while the net welfare of consumers increased as a result of changes in tariffs these benefits were unevenly distributed, with the lowest income groups witnessing a reduction in their welfare. In his discussion of the distribution of welfare Perl demonstrates that the gains from cost-based tariffs will be distributed unevenly, with the poorest 30% of households actually being worse off with cost-based tariffs (see Table C2 below).

TABLE C2: *Distribution of Welfare Gains from Cost-Based Pricing [Source: Perl, 1986]<sup>14</sup>*

<i>Income group</i>	<i>Percentage of households</i>	<i>Cost-based pricing</i>	<i>Access charge</i>	<i>Income-based access charge annual gain</i>
\$6000 or less	11.35	-68.28	10.00	56.50

<sup>12</sup> Zajac, E., (1983), "Perceived Economic Justice: The Example of Public Utility Regulation" in Peyton Young, H., *Cost Allocation: Methods, Principles, Applications* (Elsevier).

<sup>13</sup> Perl (1986), The Consequences of Cost-Based Pricing, in Miller, J., *Telecommunications and Equity*, North Holland.

<sup>14</sup> Perl (1986). We have requested permission to reproduce this information.

\$6001 to \$12 500	19.15	-7.83	15.30	62.47
\$12 501 to \$17 500	19.97	48.93	20.40	65.52
\$17 501 to \$25 000	16.03	99.03	25.00	66.44
Above \$25 000	33.80	181.95	32.00	88.83
Average	77.13	22.90	71.95	

Although Perl supports cost-based tariffing, he argues that income-based charging should be adopted as a means of allocating the distributional effects more equitably (see Table C3 below).

*TABLE C3: Telephone Penetration under Alternative Rate Regimes [Source: Perl, 1986]<sup>15</sup>*

<i>Income Group (US\$)</i>	<i>Status Quo</i>	<i>Cost-Based Pricing</i>	<i>Income-Based Access Charges</i>
\$6000 or less	80.60	71.42	79.09
\$6001-12 000	89.00	83.08	86.07
\$12 001-\$17 500	94.15	90.49	90.97
\$17 501-\$25 000	96.60	94.29	93.65
Above \$25 000	98.30	97.04	95.67
Average	93.05	89.19	90.35

Perl's work rests on assumptions about the price elasticity of demand for services and on the marginal costs (which in turn are based on operators' own cost estimates). This raises two concerns about the results produced by Perl. The first relates to the way in which relatively high levels of joint and common cost are allocated among different services (e.g. the US Justice Department has estimated such costs at between 70% and 90%).<sup>16</sup> The second concern about Perl's results relates to the difficulty which appears to remain over the actual nature of costs in telecoms networks. Because of these concerns, we believe

<sup>15</sup> Perl (1986). We have requested permission to reproduce this information.

<sup>16</sup> US Justice Department, *The Geodesic Network*, 1986, para 3.49.



that specific results produced by Perl should be treated with reasonable caution (although the general direction of the results may still be appropriate).

This line of work has been extended by Wolak.<sup>17</sup> He has assessed the likely impacts of proposed price changes (i.e. the rebalancing of local and long-distance tariffs) on the consumption of both local and long-distance phone service and consumer welfare, at the individual household level. His starting point is the observation that, in the USA: “between 45 to 49 per cent of the total cost of an inter-LATA long distance call is paid to the local exchange carriers at the originating and terminating points of the call. According to Sievers (1994),<sup>18</sup> approximately half of these payments are in excess of the costs of local access. A major rationale for these subsidies is to maintain a low price of local residential services in order to achieve goals of universal service” (p.1).

Wolak used an econometric modelling framework that specifies a complete system of consumer demand functions derived from an assumption of ‘household-level static utility maximisation’. This framework was populated with data from the Bureau of Labor Statistics’ *Survey of Consumer Expenditure*. Wolak’s analysis signals the importance of modelling telephone demand in conjunction with demand for all other goods, in order to make an accurate measurement of price and income elasticities and perform theoretically valid welfare calculations. Wolak summarised the results of his study as follows:

“We find that for price changes scenarios that balance the percent increase in local services with a corresponding reduction in long distance services, for instance a twenty percent increase in the price of local service coupled with a twenty percent decrease in long distance, the mean compensating variation is negative, which implies that the mean amount that must be paid to each household to make it indifferent to this combination of prices changes is negative. This result follows from the estimated price-inelastic demand for local service and the price-elastic demand for long distance service coupled with the very small income elasticity for local service and substantially higher income elasticity of demand for long distance service. For local price increases unaccompanied by decreases in the price of long distance service, although the mean compensating variation is positive (implying that consumers must be compensated a positive amount to be indifferent to this price change), it is still a very small fraction of the consumers’ total expenditure. For example, a forty percent increase in the price of local service only results in an average

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<sup>17</sup> Wolak, F. A., (1994), *Can Universal Service Survive in a Competitive Telecommunications Environment? Evidence from the Consumer Expenditure Survey*, Working Paper, Department of Economics, University of Stanford, California, USA.

<sup>18</sup> Sievers, M. (1994), “Should the InterLATA Restrictions Be Lifted? Analysis of the Significant Issues”, paper presented at Rutgers University Advanced Workshop in Regulation and Public Utility Economics, 6-8 July 1994.

quarterly compensating variation of \$16.35 in January 1988 dollars for the translog model. This figure is approximately 0.5 percent of the sample mean of household total non-durable expenditure, ie \$2961.25 in January 1988 dollars [...] The 5th and 95th percentile range of compensating variations for this price change for the translog model for our sample of households is \$11.19 to \$20.82 so that even for the extremes of the sample, the welfare losses associated with these price changes seem relatively minor. Even for a price increase of this magnitude (40%) we do not find any households in the population consuming a positive amount of local service before the price change reducing their consumption of telephone service to zero, which would equate with disconnecting from the local exchange network. All of these results point to the conclusion that there appears to be little loss in consumer welfare and little, if any, reduction in the fraction of households connected to the local telephone network due to the projected increases in the price of local service brought about by an increasing amount of competition in all telecommunications markets.” (p.4)

The key conclusion from Wolak’s work in the USA is that as cost-based tariffs are introduced and subsidies between long-distance and local calls are eliminated with the introduction of competition, there appears to be a net gain in consumer welfare for the majority of households. However, as commented by Wolak, these results “do not overturn the conventional belief that local increases more than proportionately burden low-income (or in our case low total-expenditure households), older headed households, or rural households. Nevertheless, our estimation results suggest that for the price changes we consider this burden is not sufficiently large to merit disconnection from the local telecommunications loop”.

### **C3.2 The Untelephoned**

The key measure used in the universal service debate has tended to be the percentage of households with a telephone. Such figures are typically quoted at a national level, and indicate that in most OECD countries the universal provision of ‘basic telephony’ is a problem of diminishing scale. As illustrated in Table C4, there was a relatively rapid increase in the residential penetration of telephony between 1975 and 1993:

**TABLE C4:** *Residential Telephony Penetration Across the EU, 1975 vs 1993*  
 [Source: ITU]<sup>19</sup>

	1975	1993
Austria	40%	88%
Belgium	42%	87%
Denmark	68%	104%
Finland	63%	104%
France	26%	100%
Germany	43%	92%
Greece	43%	92%
Ireland	22%	72%
Italy	42%	95%
Luxembourg	63%	103%

**TABLE C4:** *Residential Telephony Penetration Across the EU, 1975 vs 1993*  
 (continued)

	1975	1993
Norway	52%	97%
Portugal	21%	76%
Spain	29%	93%
Sweden	108%	121%
UK	53%	94%

However, these figures do not accurately reflect the extent to which telephone access is available in those households and areas where theory suggests that penetration would be lower. For example we know that telephone penetration in the UK is correlated with income, as shown in Table C5.

<sup>19</sup> ITU Stars Database, July 1996 release. Reproduced with the kind permission of the ITU.

**TABLE C5:**                    *Adoption of Technologies by Income Groups in the UK [Source: CSO 1995]<sup>20</sup>*

<i>Gross Income Decile Group</i>	<i>Telephone</i>
All households	91.1%
Lowest 10%	69.6%
Second decile	80.8%
Third decile	86.7%
Fourth decile	92.3%
Fifth decile	93.3%
Sixth decile	93.9%
Seventh decile	97.5%
Eighth decile	98.4%
Ninth decile	99.3%
Highest 10%	99.7%

Data from the same source (CSO 1995) gives a regional breakdown for the adoption of particular household technologies. In the UK as a whole 91.1% of households have a telephone, but the figure varies from region to region, ranging from 86.4% in Wales to 93.9% in South East England (excluding Greater London). 1988 data from Milne (1990)<sup>21</sup> shows that although 85% of UK households had a telephone, there were large variations in penetration by region and household type:

- 40% among council estates in Northumberland coalfield areas
- 45% among unfurnished tenants
- 72% among furnished tenants
- 72% among single pensioners
- 62% among lone-parent families.

Further examples of variations in penetration come from Cornford (1993),<sup>22</sup> who found penetration rates as low as 26% on a housing estate in Newcastle Upon Tyne, and a BT

<sup>20</sup> CSO (1995), *Family Spending Survey 1994-95* (HMSO, London). We have requested permission to reproduce this information.

<sup>21</sup> Milne, C., "Universal Telephone Service in the United Kingdom: An Agenda for Policy Research and Action", in *Telecommunications Policy*, October 1990.

<sup>22</sup> Cornford, J., *et al*, *Universal Service in a Liberalised Environment*, Centre for Urban and Regional Development Studies, University of Newcastle Upon Tyne (1993).

estimate from 1988 showing household penetration rates of over 122% in the old City of London District.<sup>23</sup> This data on penetration rates raises important questions about the nature of affordability and the terms under which individuals gain access to the telecoms network.

A major study of the untelephoned was conducted by the Policy Studies Institute (Callender 1995), involving 373 respondents.<sup>24</sup> This research indicated that cost is the main factor preventing individuals from having a telephone; almost two thirds of those without a telephone reported that they could not afford one. Table C6 summarises the main reasons which respondents gave for not having a telephone.

TABLE C6: *Underlying Reasons for Not Having a Telephone [Source: Callender (1995)]*<sup>25</sup>

<i>Main reason</i>	<i>%</i>
Concerns over telephone bills	39%
Initial cost of a telephone	29%
Perceived need for a telephone	19%
Total	87%

Although only 20% of all respondents said the *main* reason why they did not have a telephone was that they could not afford an extra bill, 46% of respondents mentioned it as one of the reasons. Table C7 summarises the responses given.

TABLE C7: *Sources of Concern Over Telephone Bills [Source: Callender (1995)]*<sup>26</sup>

<i>Concern Over Telephone Bills</i>	<i>%</i>
Cannot afford extra bill	20

<sup>23</sup> Data provided by BT from historical records from the old City of London District for the year 1988.

<sup>24</sup> Callender, C., (1995), in *Barriers to Universal Service: Initial Findings in USO in a Competitive Environment*, Analysys, Cambridge.

<sup>25</sup> Callender, C., (1995), in *Barriers to Universal Service: Initial Findings in USO in a Competitive Environment*, Analysys, Cambridge. We have requested permission to reproduce this information.

<sup>26</sup> Callender, C., (1995), in *Barriers to Universal Service: Initial Findings in USO in a Competitive Environment*, Analysys, Cambridge. We have requested permission to reproduce this information.

Worried about another bill	7
Worried about large bills	5
Previous telephone disconnection	3
Previous bills too high	2
Cost of calls	1
Level of charge/rental	1
Total	39

Callender observed that “over a quarter (26 per cent) of all households surveyed with no telephone were experiencing some difficulty in managing their finances at the time of the survey. A further 46 per cent were just ‘getting by’, which suggests that they may well have been experiencing problems. Nearly a third (31 per cent) had been in arrears with their bills for rent, council tax and utilities at some time over the past year” (p.148).

The second most common reason for not having a telephone was the cost of installation (47% of all respondents cited it and 29% said it was the main reason). The question of deposits was seen as a relatively minor issue, with only 1% citing it as the main reason for not having a telephone.

What emerges from this detailed study of the untelephoned is that affordability is the key factor which inhibits access to the telephone. The study reveals that there are a number of dimensions to affordability – not only the balance of total expenditure within a household but also the costs of gaining access to telecoms services and the control of expenditure. In terms of individuals’ perceived need for the telecoms service 86% of survey respondents claimed they had relatively easy access to the network either through the use of friends’ telephone or from a public call box. Of the 44% who had access via family or friends there is evidence that access was often provided at no cost.

The recommendations from this study focus on both the nature of funding access to the network through lump sums and the lack of control available to individuals in determining the financial risks associated with using the telephone. It appears that these two features of the debate on affordability could be addressed within a telecoms policy debate.

#### C4/ SUMMARY

This chapter has addressed key questions about the nature of affordability and the basis for extending the services which are included within the universal service obligation. In terms of affordability it seems that the policy debate should focus on the design and implementation of innovative policies to increase consumer control over telecoms expenditure and changes to the rather limited tariff structures and credit agreements available from the dominant carriers. Thus it is clear that some of the key issues of affordability which lie at the heart of the universal service debate can be addressed within the telecoms policy framework.

Several observations can be made in terms of extending the concept of universal service to include services other than voice telephony. The first is that universal service policy in a competitive market depends on the existence of network externalities and a recognition that telecoms is a 'merit good'.<sup>27</sup> The current structure of property rights means that market failure exists, and so consumption (based on private assessments of utility) will not be the Pareto optimum.

A related issue in this debate is the conceptual understanding of the technologies being discussed. In the case of telephony and the PSTN the technology can be argued to be **discrete**, in the sense that provision of the service includes all that is required to enjoy the full benefits of the technology; in effect, a handset is the gateway to telephony. However, in the case of other services ranging from ISDN up to full broadband technologies a fundamental shift occurs in our conceptualisation of the technology; it moves from being a discrete technology to a **configurational** technology. Such technologies are not only critically dependent on other technologies, but also on changes in the economic and social institutions surrounding the diffusion and use of the technology.

Theoretical and empirical evidence suggests that in the case of configurational technologies broader technological and institutional adaptations are critical to the diffusion of novel technologies. As a result, if the concept of universal service is extended without due regard to the parallel and necessary diffusion of other equally critical components of the technological system, the benefits of policy developments are unlikely to be secured.

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<sup>27</sup> However, it can be argued that network externalities have been substantially realised where penetration rates are in excess of 90%.

## Annex D/

### Primary Research Data on Universal Service

The following tables reproduce the findings of a survey of National Regulatory Authorities (NRAs) on aspects of telecoms services relating to universal service. This survey was carried out by Directorate General XIII of the European Commission in late 1995 and early 1996. These tables were included in a Communication on universal service from the Commission to the other institutions of the EU.<sup>1</sup> Some of the tables included in this communication are reproduced here (Tables A1 to A6 and Table A10) as valuable background information to the debate on universal service. The tables are presented here exactly as they appeared in the March Communication. In some cases the information in these tables has been superseded by changes in legislation and practice since the survey of NRAs was carried out by the Commission.

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<sup>1</sup> Universal service for telecommunications in the perspective of a fully liberalised environment - Communication to the European Parliament, The Council, the Economic and Social Committee and the Committee of the Regions, COM(96)73 Brussels 13 March 1996.



TABLE A1: Telephone Penetration Rates within the European Community

Country	Percentage of households with a telephone <sup>1</sup>		Residential Main Lines per 100 Households <sup>2</sup>	
	1990	1994	1990	1994
<b>B</b>	n/a	n/a	81	92
<b>DK<sup>3</sup></b>	94.3	n/a	103	106
<b>D<sup>4</sup></b>	80	89	81	93
<b>EL</b>	n/a	n/a	80	96
<b>E</b>	n/a	n/a	80	89
<b>F</b>	94	96.4	104	111
<b>IRL</b>	66	80	60	75
<b>I</b>	n/a	n/a	90	99
<b>L</b>	n/a	n/a	88	105
<b>NL</b>	93	96.5	96	96
<b>AUT</b>	n/a	n/a	n/a	n/a
<b>P<sup>5</sup></b>	47.1	74.8	43	64
<b>FIN</b>	95 <sup>6</sup>	97 <sup>6</sup>	103	104
<b>SWED<sup>7</sup></b>	98.7	98.7	121	121
<b>UK</b>	88	91.1 <sup>8</sup>	89	99
<b>EC Average</b>	-	-	<b>87</b>	<b>96</b>

Source: National Regulatory Authorities (1995).

n/a indicates that the NRA does not have this data available. EC average excludes Austria.

#### Notes

1. All data provided in this section of the table relates to the most recent period for which information is available (normally 1994). Where available, additional data is given in these notes.
2. This indicator of residential telephone penetration is imperfect as it is not the same as the number of households which have a telephone; the latter indicator would have an upper value of 100.
3. Source: Tele Danmark.
4. Figure includes the new Bundesländer.
5. Figures refers to penetration rate for Portuguese mainland (excluding Madeira and the Azores). The household penetration figure in 1994 including those islands was 74.8%.
6. Estimated figures for 1990 and 1995
7. % relates to 1989 which was the last year for which figures were calculated, given the very high level of penetration achieved
8. Data relates to March 1995 (Source: UK Family expenditure survey).

**TABLE A2:** *Penetration of Fixed and Cellular Telephones per 100 Population and Payphones per 1000 Population in the EC*

Country	Main Lines		Cellular subscribers		Payphones	
	per 100		per 100		per 1000	
	1990	1994	1990	1994	1990	1994
<b>B</b>	39	45	0	0.7	1.3	1.5
<b>DK</b>	57	60	2.9	9.7	1.3	1.6
<b>D</b>	40	48	0.4	3.0	1.7	2.1
<b>EL</b>	39	48	0	1.4	2.1	3.5
<b>E</b>	32	38	0.1	1.0	1.1	1.4
<b>F</b>	50	55	0.5	1.4	3.2	3.5
<b>IRL</b>	28	35	0.4	1.7	1.5	1.8
<b>I</b>	39	43	0.5	3.9	7.7	6.8
<b>L</b>	48	55	0.2	3.2	0.8	0.9
<b>NL</b>	46	51	0.5	2.0	0.5	0.7
<b>AUT</b>	42	47	0.5	3.5	4.3	4.3
<b>P</b>	24	35	0.1	1.8	2.6	3.3
<b>FIN</b>	54	55	5.2	13.3	4.1	4.6
<b>SWED</b>	68	68	5.6	16.0	4.3	3.7
<b>UK</b>	45	49	2.1	6.1	1.6	2.1
<b>EC Average</b>	<b>43</b>	<b>49</b>	<b>0.9</b>	<b>3.6</b>	<b>2.9</b>	<b>3.1</b>

Source: National Regulatory Authorities; (1995)

**TABLE A3:** Target Periods for Network Connection and Supply Times Achieved in the EC<sup>1</sup>

	Information Published	Target	Actual supply time
<b>B</b>	Yes	90% within 20 working days <sup>2</sup>	90.9% within 20 working days 61.3% within 5 working days <sup>3</sup>
<b>DK</b>	Yes	95% on installation date agreed upon with customer. Remaining 5% within 10 days.	98% within target
<b>D</b>	Yes	80% within 20 working days	87.1% within 20 working days in Western Länder 42.3% within 20 working days in Eastern Länder 98.3% of lines provided on date agreed with user <sup>4</sup>
<b>EL</b>	n/a	80% of new connections within 30 days <sup>5</sup>	220 days on average <sup>6</sup>
<b>E</b>	No <sup>7</sup>	n/a	5 working days on average
<b>F</b>	Yes	Within 5 working days <sup>8</sup>	8 days on average <sup>9</sup>
<b>IRL</b>	Occasionally <sup>10</sup>	n/a	11 working days on average 75% of customer orders completed within 2 weeks <sup>11</sup>
<b>I</b>	n/a	For new connections: 60 days For take-overs: 30 days	97.8% of connections within targets
<b>L</b>	n/a	n/a	60% within 30 days 89% within 3 months 11% over 3 months
<b>NL</b>	n/a	1 month	96% within target
<b>AUT</b>	n/a	n/a	45 days on average
<b>P</b>	Yes	Target: 2 months (95)/1.5 m(96)/1 m(97) <sup>12</sup> Minimum level : 2.8/2.4/2 months	0.4 months average (Sept. 95)
<b>FIN</b>	Yes	n/a	5.4 days on average <sup>13</sup>
<b>SWED</b>	n/a	Within 5 days <sup>14</sup>	Less than 1 day on average
<b>UK</b>	Statistics published regularly by <i>BT</i> and <i>Mercury</i> only	<i>BT</i> : For residential customers: within 8 working days. For business customers: within 6 working days <i>Mercury</i> : Access for indirectly connected customers: within 2 days of order <sup>16</sup>	<i>BT</i> : For residential 85.3% satisfied target For business customers 76.4% satisfied target <sup>15</sup> <i>Mercury</i> : 72.8% of connections on date agreed <sup>17</sup>

n/a=data not available

Source: National Regulatory Authorities (1995).

#### NOTES

- All data provided in the table relates to the most recent period for which information is available (normally 1994). Where available, additional data is given in these notes.
- Target set in Belgacom's Management Contract. The target set for 1995 is 80% of connections within 5 working days.

- 3 In 1993: 26.6% within 5 working days and 83.9% within 20 working days.
- 4 These figures relate to the second half of 1994. In first half of 1994 83% of lines provided within 20 days in Western Länder.
- 5 Target set for 1995
- 6 Data relates to 31.12.94
- 7 Information provided to the Spanish Advisory Telecommunications Council. Public can obtain information given to that body.
- 8 Target set in France Télécom's contract with the Direction Générale de Postes et Télécommunications (DGPT Annual Report (1994)).
- 9 Figure as at 31 December 1993 (Source: DGPT Annual Report (1994)).
- 10 The last set of information was published on 21 March 1994.
- 11 In 1993: 19 days on average.
- 12 Target and minimum acceptable level set in contract between ICP and Portugal Telecom and covers period 1995/1996/1997
- 13 In 1993: 5.3 days on average; in 1992: 5.5 days on average
- 14 Target forms part of Telia's service warranty.
- 15 In addition to requesting a direct connection to the Mercury Network, users can access Mercury's long-distance/international network indirectly via BT or other local connection. Access is obtained by dialling a specific preface (132) after subscribing to Mercury.
- 16 Figures relate to October 1994 to March 1995. For April 1995 to September 1995, corresponding figures are 86.9% and 78%.
- 17 Mercury completed on average 82.5% of connections on date agreed with the customer in 1993.

**TABLE A4:** Target Periods for Fault Repairs, Repair Times Achieved and Compensation Schemes Available in the EC<sup>1</sup>

Country	Fault repair times		Compensation Schemes
	Target <sup>2</sup>	Actual repair time	
<b>B</b>	71% before end of next working day <sup>3</sup>	81.3% of repairs within targets	n/a
<b>DK</b>	100% within 12 working hours	91% within target.	If Tele Danmark defaults on the time of execution concerning the change of an existing connection to the public telecommunications network, or if faults occur in the telecommunications network leading to interruptions of the connection, Tele Danmark shall make a proportional reduction in the subscription charge for the period in question, provided that the amount exceeds DKK 25. The amount shall be deducted on the subsequent invoice for subscription charges. Graduated system of discounts (up to a full 100% discount) for network connection delays and compensation schemes for network connection and fault repair delays depending on nature of service and length of delay <sup>4</sup>
<b>D</b>	80% within 3 working days	82.5% of repairs within target	Basic charge reimbursed if repair time target not satisfied
<b>EL</b>	60% within 24 hours <sup>5</sup>	57% within target	Reimbursement of a proportionate part of the monthly line rental for repairs exceeding repair time target
<b>E</b>	Within 6 days <sup>6</sup>	98.4% of faults attended to within 24 hours	n/a
<b>F</b>	92% before end of next working day <sup>7</sup>	86.3% of repairs within target <sup>8</sup>	No schemes in operation
<b>IRL</b>	n/a	90% within 2 days <sup>9</sup>	n/a
<b>I</b>	n/a	67.3% same day 97.1% within 2 days	Rental charge reimbursed if repair time target not fulfilled
<b>L</b>	Within 5 days <sup>6</sup>	86.2% same day 100 % within 10 days	Twice the monthly rental will be reimbursed if repair targets not met
<b>NL</b>	Within 12 working hours	98% of repairs within target	Reimbursement of 1/30 of monthly line rental for every day of delay to line repair in excess of repair time target
<b>AUT</b>	Within 1 day <sup>6</sup>	93% within 24 hours	Reimbursement of the monthly subscription corresponding to the number of days for which service was interrupted
<b>P<sup>10</sup></b>	Objective : within 2 working days 83%(95)/ 85%(96)/ 90%(97) Minimum level: 75%/80%/85%	92% within 2 working days(September 1995)	

Country	Fault repair times		Compensation Schemes
	Target <sup>2</sup>	Actual repair time	
FIN	n/a	66.4% within 24 hours <sup>11</sup>	There is a reimbursement of a monthly basic fee if the line is out of order for more than 48 hours within one month.
SWED	Within 1 working day <sup>12</sup>	93% of repairs within target	Discount of quarterly fee if new connection not within 5 days or if fault not repaired within repair time target
UK	BT: by end of next working day <sup>6</sup> Special services guaranteeing a quick response are offered at an <i>extra fee</i> Mercury: For 2100 service, within 24 hours; for indirect service, 90% of faults within 24 hours	98.9% of business customer faults 95.2% of residential customer faults repaired within 2 working days <sup>13</sup> 68.3% within 4 hours 94.1% within 48 hours	Compensation available for various service failings either on the basis of a daily rate or actual financial loss, up to maximum of £1000 <sup>14</sup> Compensation available for late delivery of service depending on nature of service and length of delay, up to maximum of £5000

n/a: data not available

Source: National Regulatory Authorities (1995)

#### NOTES

- 1 All data provided in this table relates to the most recent period for which information is available (normally 1994). Where available, additional data is given in these notes.
- 2 Where possible and where no specific target has been provided repair time targets have been adduced from time limits used in the corresponding compensation scheme for the purposes of determining entitlement to compensation. See footnote 6 below.
- 3 Target set for 1994 by management contract between Belgacom and the Belgian Government. The target has been set at 76% for 1995.
- 4 For example, a network connection delay of up to 10 working days will entitle the subscriber to a discount of up to 30% on the connection fee and a delay of over 2 working days in repairs to basic telephone services entitles the subscriber to 50 DM.
- 5 The Special Circular of 24 July 1995 amending the Greek Telephone Regulation imposed a target of 5 working days for 1995 and of 3 working days for 1996.
- 6 Target adduced from time limits adopted in compensation scheme for purposes of determining entitlement to compensation.
- 7 Target set in France Télécom's general contract with the Direction Générale de Postes et Télécommunications (Source: DGPT Annual Report (1994)).
- 8 Figure as at 31 December 1993 (Source: DGPT Annual Report (1994)).
- 9 This figure relates to customer reported faults. With regard to line faults 88% are repaired within 2 days.
- 10 Target and minimum acceptable level set in contract between ICP and Portugal Telecom and covers period 1995/1996/1997. Compensation available after 3 days without if fault is operators responsibility and after 10 days without service if *force majeure*.
- 11 In 1993, 73.5% of faults were repaired within 24 hours.
- 12 Target forms part of Telia's service warranty.
- 13 Figures relate to period April to September 1994. In the same period, 87.6% of business and 75.5% of residential faults were repaired within 5 working hours or 9 working hours respectively or on a date agreed with the customer.
- 14 On the daily rate basis, the customer is entitled to claim one month's rental for each day of delay.

**TABLE A5:** *Average Percentage of Public Payphones in Working Order in Member States in 1994<sup>1</sup>*

<b>B</b>	<b>DK</b>	<b>D</b>	<b>EL</b>	<b>E</b>	<b>F</b>	<b>IRL</b>	<b>I</b>	<b>L</b>	<b>NL</b>	<b>AUT</b>	<b>P</b>	<b>FIN</b>	<b>SWED</b>	<b>UK</b>
n/a	92 <sup>2</sup> 97 <sup>3</sup>	n/a	95	n/a <sup>4</sup>	n/a <sup>5</sup>	Over 93	n/a	ver 9	95	97	99.9	n/a	+/- 98	94.6 <sup>6</sup>

n/a: data not available

Source: National Regulatory Authorities (1995).

**NOTES**

- 1 All data provided in the table relates to the most recent period for which information is available (normally 1994). Where available, additional data is given in these notes.
- 2 Coin operated payphones.
- 3 Card operated payphones.
- 4 The average repair time in public telephones of all types (that is in public and private places) is 2.8 hours; for public telephone boxes it is 10.6 hours.
- 5 France Télécom's general contract with the Direction Générale de Postes et Télécommunications stipulates that only 5% of public payphones should remain out of order for more than 24 hours. As at 31 December 1993 4.8% remained out of order for a longer period (Source: DGPT Annual Report (1994)).
- 6 This figure relates to BT public payphones for the period October 1994 to March 1995. For the preceding 6 month period the figure was 95.9%.

TABLE A6: Availability of Advanced Telephone Facilities in the EC

Country	Dual-tone Multi-Frequency (DTMF) Dialling	Call Waiting	Call Forward	Voice-mail in the public network	Calling Line Identification	Call Barring Facilities
B	Yes <sup>1</sup>	Yes <sup>2</sup>	Yes <sup>2</sup>	Yes	Yes <sup>3</sup>	Yes <sup>4</sup>
DK	Yes	Yes <sup>5</sup>	Yes <sup>5</sup>	Yes <sup>5</sup>	No <sup>6</sup>	Yes <sup>7</sup>
D	Yes	Yes	No <sup>8</sup>	Yes	Yes	Yes
EL	Yes <sup>5</sup>	Yes <sup>5</sup>	Yes <sup>5</sup>	No	No	No
E	Yes	Yes <sup>9</sup>	Yes <sup>9</sup>	No	No <sup>10</sup>	No
F	Yes	Yes	Yes	Yes	Yes	Yes
IRL	Yes <sup>5</sup>	Yes <sup>5</sup>	Yes <sup>5</sup>	Yes <sup>5</sup>	No	No
I	Yes <sup>5</sup>	Yes	Yes	No <sup>11</sup>	Yes <sup>3</sup>	Yes <sup>12</sup>
L	Yes	Yes	Yes	No	No	Yes <sup>13</sup>
NL	Yes	No <sup>14</sup>	Yes	No <sup>11</sup>	No <sup>15</sup>	Yes
AUT	Yes	Yes	Yes	Yes <sup>16</sup>	Yes <sup>3</sup>	Yes <sup>17</sup>
P	Yes <sup>18</sup>	Yes <sup>18</sup>	Yes <sup>18</sup>	Yes <sup>16</sup>	Yes	Yes <sup>18,4</sup>
FIN	Yes	Yes	Yes	Yes	Yes	Yes <sup>19</sup>
SWED	Yes	Yes	Yes	Yes	Yes	Yes
UK	Yes	Yes	Yes	No <sup>11</sup>	Yes	Yes

Source: National Regulatory Authorities (1995).

#### NOTES

- 1 For 93.5% of PSTN lines.
- 2 For 60% of PSTN lines.
- 3 Available on ISDN
- 4 Call barring available to block access to kiosk services.
- 5 Commercially availability linked to whether subscriber is connected to a digital exchange (percentage of subscribers for those States indicated in brackets) : DK (55%), EL (3%), IRL (75%) and Italy (67%)
- 6 Gradual introduction from February 1996.
- 7 Commercially available blocking access to specific value-added services; per line or per call barring of call facilities (such as call identification) will be introduced in December 1995.
- 8 Technical possibility on ISDN but this is not commercially available for the moment.
- 9 47.8% of the subscribers have the possibility to access this service.
- 10 There is a plan to offer such a service in 1996 for subscribers connected to digital switches.
- 11 Voice-mail was on trial in 1995.
- 12 Call barring facilities for trunk traffic and kiosk billing services.
- 13 Customers have the possibility of per line barring of call facilities.
- 14 Pilot in 1995 and introduction in 1996.
- 15 Pilot in 1995.
- 16 Available for mobile telephone (GSM).
- 17 Barring access available only to specific value-added services (not per line or call blocking facilities)
- 18 Available whenever it is technically feasible and for CLI, available on ISDN whenever it is technically feasible.
- 19 Customers are offered the possibility of per line barring of call facilities and barring access to specific value-added services.



NBeD landscape table

NBeD landscape table

Table A10 - Special tariff schemes for targeted user groups in the EC

Country	Description of scheme
BE	The contract between the Belgian State and Belgacom imposes certain tariff reductions for social or humanitarian reasons. i) social groups: Around 370.000 people are benefiting from the social telephone rate (8.1% of the total number of connections). The following tariff reductions are applied: 70% reduction of connection charges, 50% reduction of rental fee, and 50 free units of traffic for 2 months. ii) Elderly and handicapped: Reduced tariffs for elderly (over 65) and handicapped.
DK	Specific text-telephone service under operation for hearing impaired users, including provision of different types of terminal equipment. The service is provided on a non-commercial basis. Reduced tariffs for visually impaired and blind users when using Directory Services.
D	Reduced tariff scheme for elderly, disabled, and low income groups. These special groups receive a 5 DM reduction on rental charges and 30 units free of charge per month. There will be a tariff re-balancing in 1996 which will make larger discounts. There is no low usage tariff scheme and there is none foreseen.
EL	i) Disabled: Special reduced rates have been introduced for blind subscribers. Blind subscribers are allowed 150 units a month free of charge on the first main telephone line subscribed in their name. Additionally, specially designed public card phones have been installed at airports, railway and bus stations and hospitals. There is no special policy on low user schemes within the context of universal service.
E	i) Elderly and handicapped: Special "social subscription" that consists of a 95% discount on the monthly fee and a 70% discount on the initial connection fee for those citizens over 64 and handicapped (only when they do not receive a certain level of income).
F	i) Handicapped, elderly and social groups: Reduced tariffs for special and social groups, such as handicapped, aged over 65 living alone or with their partner and war veterans. These reductions include a 50% reduction on subscription fee, 40 units free of charge per month (domestic calls), and free access to information services. ii) The low user scheme gives a reduction for those who use less than 26 units per month.
IRL	Free rental and subsidised usage scheme provided to specific user groups such as the deaf, the aged and the disabled. i) Disabled: The deaf customers can use special text terminals (Minicom) to communicate with non-deaf customers. Due to the fact that this method is slower than normal speech, the operator has a refund scheme under which deaf customers are entitled to reclaim up to 70% of the cost of their calls subject to an annual maximum. Additionally, the State may refund the VAT element of the purchase price of the Minicom equipment for the deaf. ii) The company also provides financial assistance to other voluntary charitable groups, such as Samaritans, Irish Cancer Society, Rape Crisis Centre, etc. which allows the organisation to be contacted by users of their services either by freephone or at a reduced rate. iii) Low user scheme: there is a low user scheme on its analogue mobile service which provides service with connection charges as little as 41% of normal charges, rental charges as little over 103% of normal charges but which includes a credit per month on national calls. iv) Aged and disabled: The Department of Social Welfare provides state aid for the aged and disabled, i.e., free telephone rental for certain aged and disabled people living alone or with other excepted persons.
Country	Description of scheme
I	Since January 1995, there is a special scheme for low consumption users upon request (it includes a low rental fee and low tariffs for low consumption per month, i.e., up to 40 units/month: 50 lira).
L	P&T Luxembourg has no plans to introduce specific schemes targeted towards particular social groups as the basic telephone tariffs are very low.
NL	There is no special scheme targeted to a specific group of customers.
AUT	Certain social groups, including the blind, handicapped, pensioners, low income people, students, are exempted from paying the following fees: basic monthly connection fee and one free hour of telephone use per month.
P	There are special tariff reductions for retirees and pensioners with a monthly salary less than the national minimum. The reductions are the following: a 60% reduction of subscription fees and at least 25 units free of charge per month. The operators are equally obliged to concede the following facilities for population with special needs: micro telephones with amplifier, a call warning, etc.
FIN	There are no special schemes regarding telecommunications charges. The state budget finances special services targeted to some special groups, which operators are not willing to provide (i.e. special services for disabled).

SWED	<p>There is an agreement between the State and Telia, where the latter has committed itself to provide the <u>low consumption subscription</u> (Telia Mini). The quarterly fee must not exceed 70% of the regular quarterly fee and at least 10% of household customers should benefit from to this type of subscription.</p>
UK	<p>BT provides the following schemes:</p> <ul style="list-style-type: none"> <li><u>Spread connection fee</u> - which divides the initial connection charge into 5 quarterly payments (plus an administration charge)</li> <li><u>Deposits</u> - in 1996 BT plans to introduce Usage Limits, whereby new customers agree a financial ceiling on call expenditure. This should largely eliminate the need for deposits.</li> <li><u>Low User Scheme</u> - BT provides this under its licence, the guidelines for which are negotiated with the regulator.</li> <li><u>Elderly and Disabled</u> - new customers over 65 will not be asked for a deposit unless they owe BT money or are bankrupt (Kingston has a similar policy)</li> <li><u>Protected Service Scheme</u> - enabling elderly and disabled customers to nominate a third party to deal with bill payment.</li> <li><u>Free Priority Fault Repair Service</u> - for customers whose telephones are vital lifeline - scheme is designed to ensure priority treatment in the event of a fault.</li> <li><u>Visually impaired and blind customers</u> - are offered large print/Braille/"talking" bills and free Directory Enquiries (all companies offer the latter in order to meet a licence requirement). Free Directory Enquiries is offered to visually impaired customers and others who are physically unable to use the printed phone book.</li> <li><u>Deaf users</u> - have access to Type talk, a national telephone relay service, which BT is obliged under its licence to provide and fund. A Text User's Rebate is available to acknowledge that calls made on by text phones take longer than the voice telephony equivalent. Some cable companies offer disabled customers personal visits to collect their bill payments.</li> </ul>

Source: National Regulatory Authorities (1995)

## Annex E/ Comparison of ISDN and PSTN Pricing in Member States

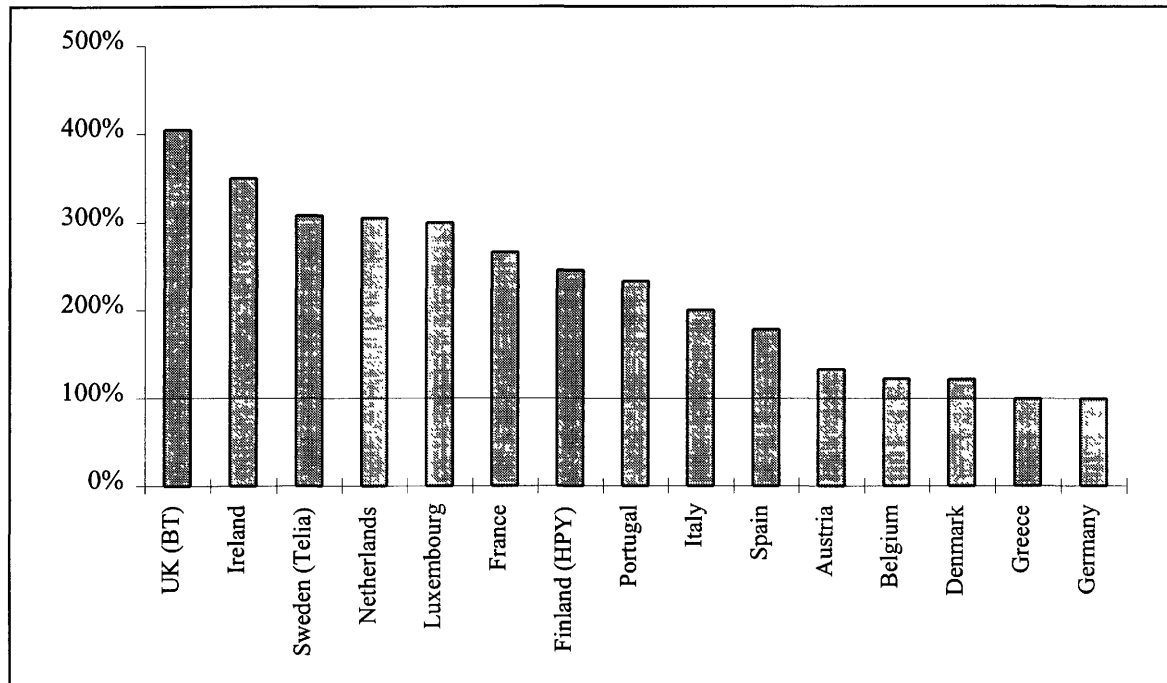
The pricing policies adopted by European TOs for basic rate ISDN vary considerably. There has been a tendency to charge at rates similar to PSTN charges for each B-channel used. However, connection and rental charges have tended to be higher than the equivalent charges for PSTN.

This annex presents an analysis of the different components of ISDN tariffs and presents these as a proportion of the equivalent PSTN tariff components. For accuracy of comparison the following restrictions apply to the tariffs chosen:

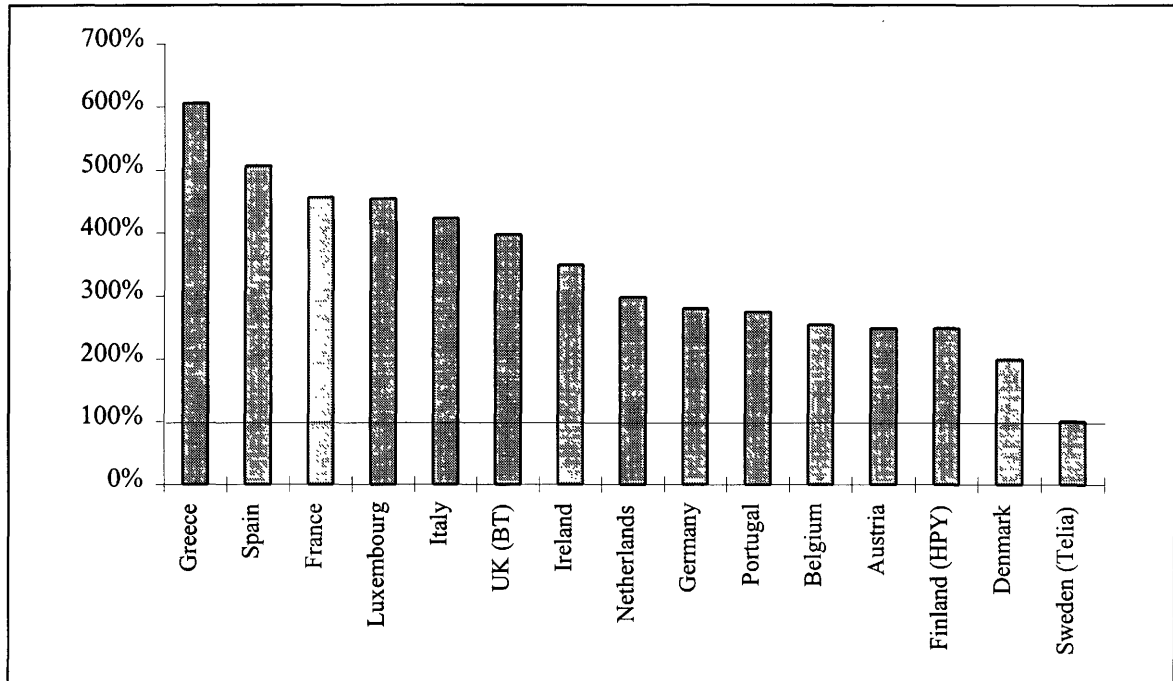
- all calls at peak rates
- all rentals are the most expensive rental available
- all lines are rented (rather than owned)
- all calls to other EU countries are to the most expensive other EU country
- no discounts have been applied
- connection charges are for a new line (rather than reconnection of an existing line)
- all lines are residential lines.

The graphs included in this annex were generated from data provided by Phillips Tarifica.

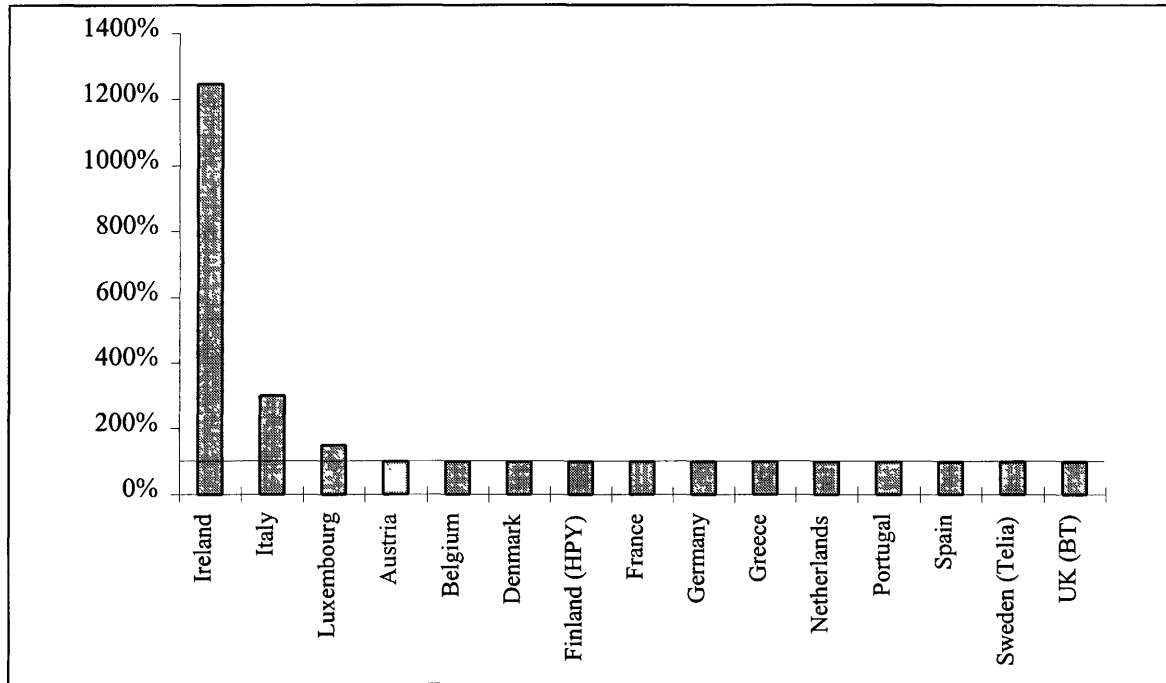
**EXHIBIT E1:** *Basic Rate ISDN Connection Tariff as a Proportion of PSTN Connection Tariff [Source: Analysys]*



**EXHIBIT E2:** *Basic Rate ISDN Rental Tariff as a Proportion of PSTN Rental Tariff [Source: Analysys]*



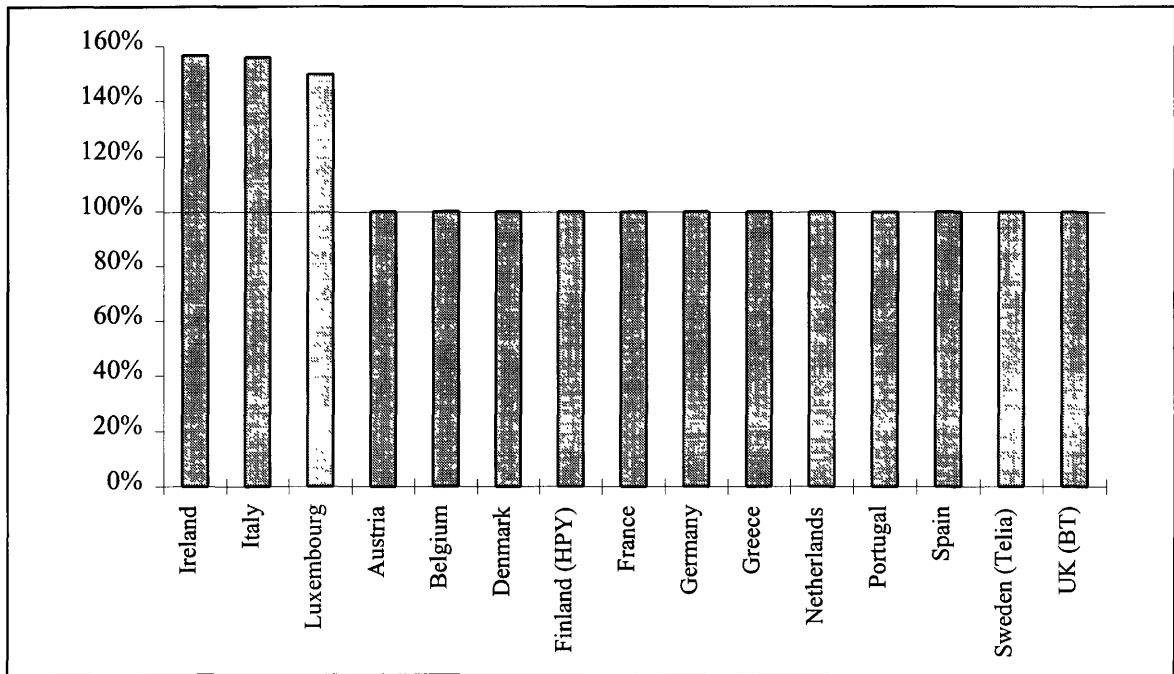
**EXHIBIT E3:** Basic Rate ISDN Local Usage Tariff as a Proportion of PSTN Local Usage Tariff<sup>1</sup> [Source: Analysys]



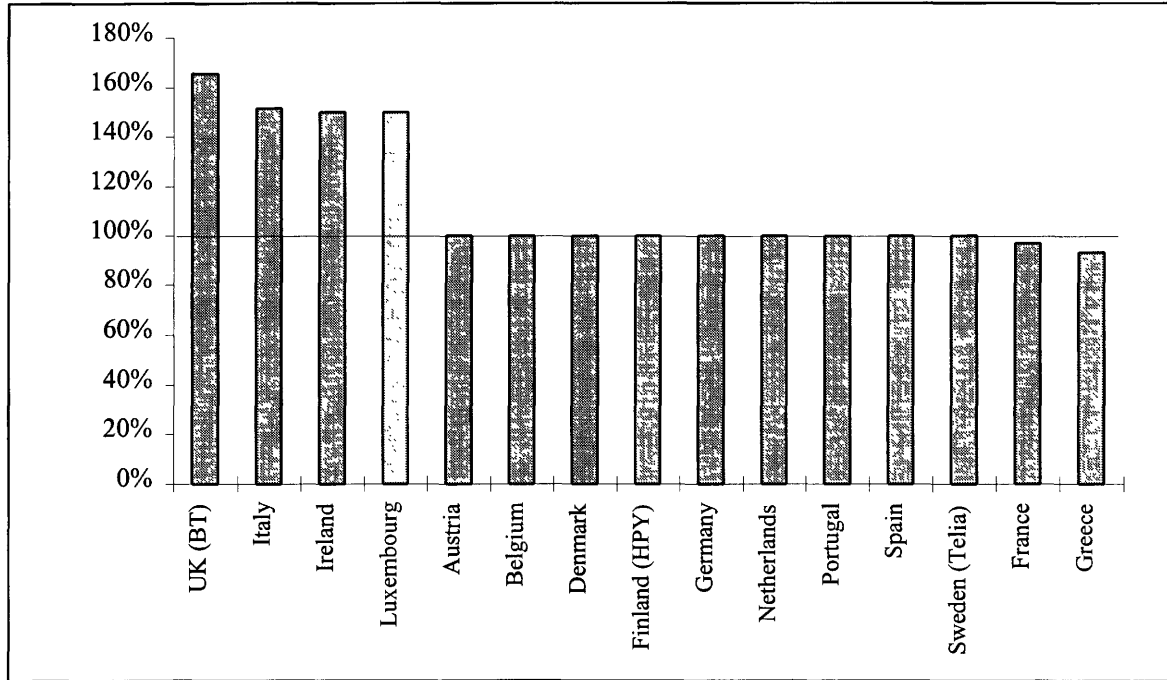
<sup>1</sup> Local ISDN calls in Ireland are charged at national ISDN call rates.



**EXHIBIT E4:** Basic Rate ISDN National Usage Tariff as a Proportion of PSTN National Usage Tariff [Source: Analysys]



**EXHIBIT E5:** *Basic Rate ISDN International Tariff to a Distant EU Member State as a Proportion of the Equivalent PSTN Tariff<sup>2</sup> [Source: Analysys]*

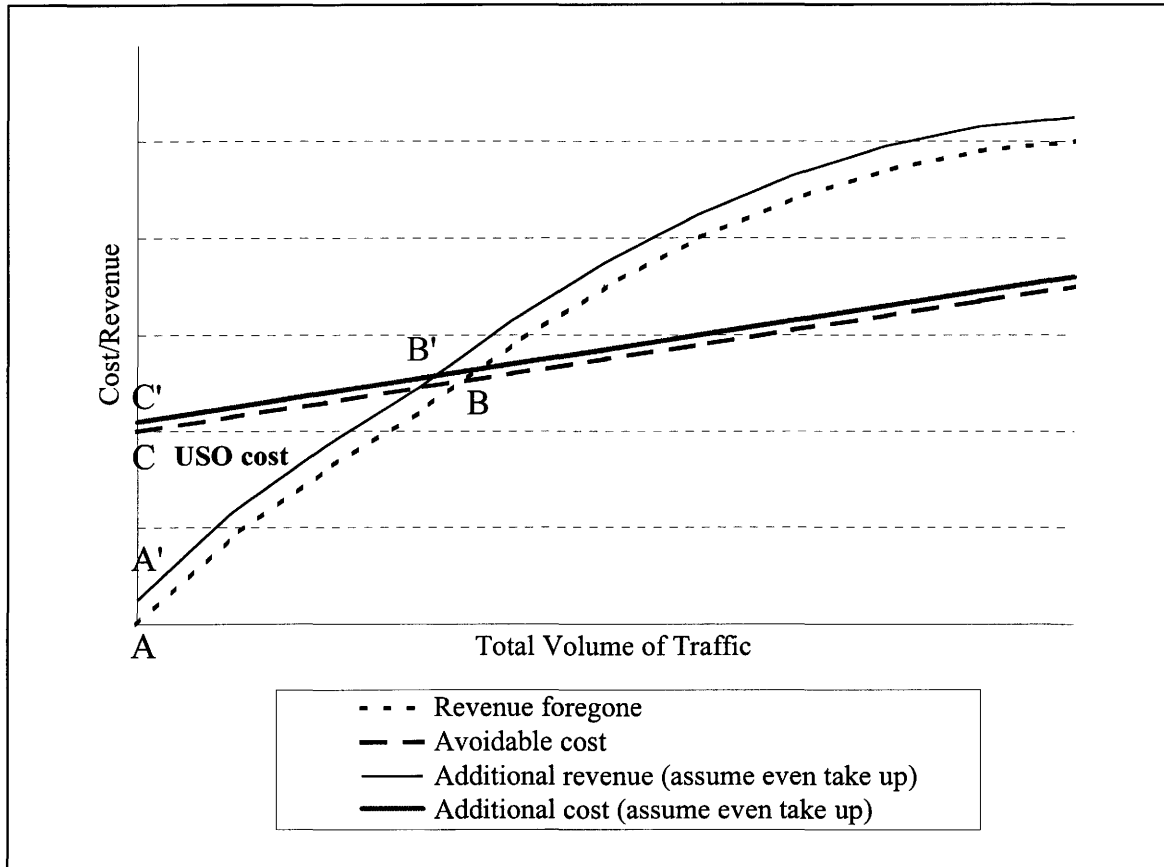


<sup>2</sup> In France and Greece the charges per B-channel fall below PSTN rates, because international ISDN tariff is a single 24-hour tariff rather than a cheaper off-peak tariff and a more expensive peak tariff .

## Annex F/ The Effect of Increased Local Loop Utilisation on the Cost of Universal Service

Exhibits F1 and F2 show the hypothetical relationships between avoidable cost and revenue foregone, solely depending on traffic volume. The area under the avoidable cost curve and above the revenue foregone curve is equal to the cost of universal service provision (the area denoted by the triangle A, B and C). As shown in Exhibit F1, this area will decline if there is even take-up of Internet services (assuming that local calls are profitable at the margin) to the triangle denoted by A', B' and C'. However, as Exhibit F2 shows, under non-even take-up the effect on the total area will be negligible (ignoring the effect of economies of scale), declining to A", B" and C".

**EXHIBIT F1:** *Avoidable Costs, Revenues Foregone and Implied Cost of Universal Service Provision: Even Take-up of Internet Services (Illustrative)*



**EXHIBIT F2:** *Avoidable Costs, Revenues Foregone and Implied Cost of Universal Service Provision: Non-Even Take-up of Internet Services (Illustrative)*

