Department of Trade & Industry

Communications Liberalisation in the UK

Key Elements, History & Benefits

MARCH 2001

Note: This booklet has no legal force and should not be regarded as an authoritative statement of the law. Ultimately interpretation of the regulatory regime is a matter for the courts, and, where appropriate, interested parties should take their own legal advice.

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1. INTRODUCTION

Since the privatisation of BT in 1984, the UK telecommunications market has experienced unprecedented expansion, in terms of both the overall volume of business (£7.5bn in 1984, over £31bn per annum in 2000), and the range of services on offer. In 1984 the independent regulator the Office of Telecommunications (OFTEL) was set up, providing regulatory safeguards such as the universal service obligation on BT which have been maintained ever since.

This growth has been encouraged and facilitated by a progressive and sustained opening up to competition. In March 1991, the Government published a White Paper, "Competition and Choice: Telecommunications Policy for the 1990s", which set out measures designed to encourage growth and expansion of the telecommunications market. This ended the "duopoly policy", which had limited competition in the fixed network to BT, the formerly state-owned incumbent operator, and Mercury, the first fixed-link competitor, during most of the 1980s. Cable operators and other Public Telecommunications Operators subsequently provided infrastructure competition to BT, and many indirect access operators have been licensed to provide effective services competition. In 1980, customers in the UK were reliant on one state-owned monopoly meeting their entire telecommunications needs. Today, they have a choice at every level of UK telecommunications, from handsets and other equipment to broadband services accessed through Internet Protocol networks. Liberalisation and competition have been the keys to dramatic reductions in prices and the much greater choice now available to consumers as other countries have followed the UK's lead and opened up their markets. Many features of the UK system, notably the setting up of an independent regulatory body, have been imitated elsewhere as the UK has encouraged other countries to liberalise their telecommunications markets.

Since the 1990s the fast pace of technological change in this industry has played a part too, with explosive growth in the use of high capacity broadband networks facilitating electronic communications, in particular over the Internet, over the past five years. The telecoms networks which traditionally carried mainly voice traffic are now being upgraded into high-speed information networks, and new networks such as BT's purpose-built Internet Protocol trunk network are also being developed. A major advance is Digital Subscriber Line (DSL) technology which has recently started to carry high-bandwidth services over existing copper wires to consumers' homes. Further innovation is now coming in with service competition particularly in broadband services as BT's local loop is unbundled from 1 January 2001 to allow other operators to upgrade its exchanges by installing their own (DSL or other) equipment to provide Internet access and other broadband services to consumers.

We are seeing further dramatic changes as the telecommunications industry becomes more global in nature and as convergence with information technology and broadcasting strengthens. To prepare the UK for the challenges that lie ahead the Government has just published a further White Paper " A New Future for Communications" addressing the convergence of telecoms and broadcasting by reform of the regulatory frameworks, including a single regulator for the whole electronic communications sector.

2. TELECOMMUNICATIONS LIBERALISATION SINCE 1980: KEY MILESTONES

1981: British Telecom Act separates BT from the Post Office.

1982: Mercury Communications issued with a licence to build and operate a second fixed link network in competition with BT.

1984: 51% of the Government's shares in BT sold: BT became a plc.

The 1984 Telecommunications Act establishes OFTEL.

1985: Licences issued to Cellnet and Racal-Vodafone to run competing cellular networks.
First cable television licences issued.

1991: Duopoly review and publication of White Paper *Competition and Choice: Telecommunications Policy for the 1990s.* Cable television operators also allowed to run voice telecommunications systems.

1993: First post-duopoly PTO (Public Telecommunications Operator) licence granted.
Cable companies start to be licensed to provide competition to BT in the local loop.

1996: Launch of the Government's Information Society Initiative in February, which aims to promote the beneficial use and development of information and communications technologies - multimedia - in the UK.

International Facilities liberalised. 44 licences issued in December 1996.

1997: UK Chairmanship of the WTO negotiations led to agreement on 15 February 1997 by 69 members of the World Trade Organisation (WTO) to open their basic telecoms markets to competition.

1998: European Union Telecoms Networks fully liberalised from 1 January, following the UK's lead.

1999: EU 1999 Review of telecommunications started, with a view to revised Directives bringing European telecoms regime up to date in line with convergence of telecoms and broadcasting.

2000: UK Government's Communications White Paper published with proposals to bring UK communications regulatory framework up to date with the convergence of telecommunications and broadcasting industries and increasing use of world-wide electronic communications.

3. KEY MARKET DEVELOPMENTS SINCE 1980

THE 1984 TELECOMMUNICATIONS ACT

This Act set the framework for a competitive market for telecoms services by abolishing British Telecommunications' exclusive right to provide services, and by establishing its successor company in the private sector, British Telecommunications plc. It also set a framework for the approval of equipment in the UK. It established the regulator, the Director General of Telecommunications (head of the Office of Telecommunications, OFTEL), and set out the duties of the Director and those of the Secretary of State for Trade & Industry in relation to telecommunications. Key duties of both are to promote the interests of consumers and maintain and promote effective competition.

In the 1980s, only BT and Mercury were licensed to run telecoms networks. Mercury provided a degree of competition to BT, giving some consumers a choice and lower prices. So far as fixed-link networks are concerned, this duopoly policy remained in force until 1991.

THE 1991 DUOPOLY REVIEW

A White Paper of 1991 entitled "Competition and Choice: Telecommunications Policy for the 1990s" set out a revised policy ending the duopoly in respect of all services other than international services over a company's own facilities. The White Paper encouraged new telecommunications operators to enter the market and allowed some existing operators to offer a wider range of services. In particular the White Paper proposed:

> to allow new operators to run "fixed link" networks in the UK;
>
> to allow cable television companies to provide telecommunication services in their own right rather than as the agents of BT or Mercury;
>
> to license international simple resale on routes where the far-end is equivalently liberalised; to extend the coverage of class licences;

These decisions started unleashing the full potential of competition, which had already been accelerating during the 1980s. International services were opened up to competition in 1996, when this became practical in the light of international developments.

COMPETITION IN FIXED SERVICES

A number of new national Public Telecommunications Operators (PTOs) were licensed in the early 1990s, and now operators continue to be licensed, adding further to competition in the market. Cable television operators, who previously had not generally been licensed to provide voice telephony, now began to increase the roll-out of their own networks, and built them out extensively throughout the 1990s, providing infrastructure competition to BT in the local loop.

The 1991 White Paper also announced that the UK would allow new competition in international services. Many companies were licensed to provide low-cost International Simple Resale (ISR)

services, over leased circuits connected to the public switched network at both ends, to countries providing equivalent freedoms to provide the same service in the opposite direction.

In 1996 the Government liberalised the market further by licensing an initial batch of 44 companies to provide international telecommunications services on any route they choose over their own facilities. These International Facilities Licences (IFLs) were granted over a year ahead of the EU's deadline for full competition across Europe, confirming the UK's telecommunications market as the most open in the world. At the same time, the decision was taken to lift the "equivalency" rules which were limiting International Simple Resale (ISR) services to certain routes. The effect of ISR and international facilities liberalisation has reduced BT's share of the UK market for international calls to about 50%. In order to implement the EU's Licensing Directive in 1999, the IFL licences were combined with national PTOs to create a single licence which is now the standard format for PTO licences. There are now over 140 companies licensed to provide international services over their own facilities.

Operators now run services under a registrable class licence for International Simple Voice Resale (ISVR). With its low barriers to entry, ISVR has provided rapid competition in the provision of international phone calls, with prices falling at least 50% in real terms since 1991. Against the backdrop of the progressive worldwide implementation of the WTO Agreement on Trade in Basic Telecommunications, the resale of data services over leased circuits connected to the public switched network at both ends is now completely liberalised.

From the early 1990s, applications have been considered on their merits to provide international satellite services with connection to the public switched network at one end of a call for voice services, and at both ends for data. 13 licences have been issued to date.

All this has ensured the competitiveness of the UK as a prime location for companies for whom telecommunications plays a major role in their business. Users have already benefited from lower prices and increased choice of operators and services.

APPLYING FOR A NEW LICENCE

Any company, consortium, partnership or individual who wishes to apply to the DTI for a telecommunications licence may do so. They should first consider whether an individual licence is necessary. Under the Telecommunications Act 1984, it is an offence to run a system or provide a service which is not covered by a licence of some description, but as explained above, many services can be provided within the terms and conditions of existing class licences.

All information received in connection with applications is treated in strictest confidence, but a short description of the proposed activity is included on a register of applications published regularly by OFTEL. Systems using radio also need a spectrum licence issued by the Radiocommunications Agency under the Wireless Telegraphy Act 1949.

An initial fee, intended to reflect the cost of issue, is payable to the Government when a licence is granted. In addition, an annual renewal fee is paid to OFTEL to cover its work in enforcing licences.

For further information on the scope of existing class licences, OFTEL can be contacted on 020 7634 8923.

For advice on application procedures for individual licences, guidance notes are available on DTI's website at: http://www.dti.gov.uk. [or contact DTI on 020 7215 1777.]

CABLE NETWORKS

Throughout the 1980s and particularly from the early 1990s, when they were allowed to provide voice telephony services, cable television operators have steadily expanded their activities in the UK.

The cable systems used to convey cable television can also be used to carry telecommunications services. Therefore, the cable operators, merging from the one hundred or so individual companies awarded licences into two operators, Telewest and NTL, have been able to become major new providers of the "local loop". The number of cable homes "passed" (ie where the cable operator has run a cable along the street allowing subsequent connection in the home) as of 1 July 2000 stands at 12.8 million and the number of homes connected (for either TV or telephony, or both) at 4.8 million.

Originally, all cable and local delivery operator franchises were offered on an exclusive basis. However, in order to stimulate further competition, from 1 January 2001 operators may compete throughout the country.

MOBILE COMMUNICATIONS

The growth in the mobile telecommunications sector over the last decade has been one of the major success stories in UK telecommunications; the UK has been at the forefront of developing mobile services. Constraints on the availability of radio spectrum for mobile communications have led the Government to develop a competitive regulatory framework, introducing new services on a competitive basis and giving opportunities to new entrants wishing to bring greater innovation and quality to the consumer.

Mobile Telephony

The most visible area of mobile communications is GSM cellular telephony, which supports both car phones and hand-portable mobile phones. Four companies are licensed to provide GSM services. Vodafone and Cellnet have one digital GSM network each in the 900 MHz band and one in 1800 MHz. One2One and Orange each operate a PCN network in the 1800 MHz band.

Since the end of 1998, growth of the mobile phone industry has increased exponentially with the number of subscribers doubling in the following two years, with many new customers using prepaid payment options. The total number of mobile phone users now exceeds 34 million, which represents a penetration level in the UK of over 60%. While this is not the highest penetration level in Europe (the Scandinavian countries top the list with levels greater than 75%) the UK is ahead of other major European countries such as France and Germany. The UK is the sixth largest cellular market in the world. Forecasts of whether rapid growth in mobile phones in the UK will continue are of course speculative. Industry projections now suggest there could be a penetration level of over 80% in the UK with mobile phones by 2005, and this could be an underestimate.

The cost of making a call from a mobile phone has fallen approximately 50% since 1994 and approximately 20% in the last 18 months. Allied to this, the cost of making a phone call to a mobile phone from a fixed line has fallen 25% since OFTEL acted in 1999 to require operators to lower their charges for calls to mobiles.

The UK took the lead in Europe to develop the standards for digital GSM mobile phones. This ground-breaking development has allowed Europe to establish GSM as the pre-eminent technology for second generation mobile telephony - 80% of all mobile phones sold in the world are GSM phones. We were at the forefront in the world in establishing these second generation networks, again led the world in introducing PCN digital networks, and are now a leading force in developing third generation mobile telecommunications, known as Universal Mobile Telecommunication Services (UMTS).

Universal Mobile Telecommunications Services (3G) - Mobile Multimedia

In May 2000 the UK awarded five licences for 3G to the companies that were successful in the Spectrum Auction, Vodafone, BT 3G, Orange, One 2 One, and TIW (Telesystem International Wireless), now Hutchison 3G UK Ltd. The UK is taking a leading role in developing the standards involved. 3G is taking personal mobile communications into the 21st century and is central to the Information Age. Third Generation (3G) mobile phones will provide high-speed data access to all forms of information whilst on the move. Customers will be able to access the wealth of material on the Internet, go home shopping or conduct video conferences or receive services as if from a fixed terminal, without being tied to such a terminal. Services should be available from 2003.

Other Mobile Radio Technologies

At the end of 1997, Dolphin Telecommunications Limited were licensed to run a national digital Trans European Trunked Radio (TETRA) network in the UK and thus provide further competition to the aforementioned mobile operators. It is expected that their system will be particularly attractive to businesses wanting both conventional mobile telephony services and instant closed-user group communications from the same handset. TETRA technology provides significant improvements in spectrum efficiency for larger public access mobile radio networks, as well as enhancing the variety and quality of services to the user which include advanced speech and data facilities, wide area coverage and greater immunity from interference and eavesdropping. The UK again believes it is leading Europe in advanced mobile technology.

The UK paging market continues to grow strongly. The subscribers are shared mainly between 4 national operators: BT, PageOne, Vodafone Paging and Hutchison: all running networks to the Post Office Code Standardisation Group (POCSAG) standard. In addition, Sprintel are running a regional paging network in the London area. The introduction of new services such as two-way paging will continue to fuel growth in this market sector.

Permitted Development Rights and Mobile Safety

Town and Country Planning is the responsibility of the Department for the Environment, Transport and the Regions (DETR). Under the Town and Country Planning (General Permitted Development) Order 1995 (the GPDO), Telecommunications Code Operators (PTOs with the right to install their own network in line with the provisions of the Telecommunications Code, Schedule 2 to the Telecommunications Act 1984) have the right to carry out certain types of development without the need to apply for specific planning permission. Development permitted in this includes the erection of radio masts up to 15m in height.

Currently, masts are subject to a prior approval system, under which an operator must apply to the planning authority for a determination as to whether it wishes to approve, within 28 days, details of the mast's siting and appearance. The local planning authority is able to refuse approval where it considers that the development poses a serious threat to amenity.

The certainty inherent in the GPDO procedure has facilitated the rolling out of alternative network infrastructure in the UK, ultimately to the benefit of consumers through greater innovation and competitively priced telecommunication services.

The Independent Expert Group on Mobile Phones (IEGMP), chaired by Sir William Stewart, published its report about the possible health effects of mobile technologies including mobile phone masts on 11 May 2000. The Government welcomed the Stewart Group's report and has been consulting on implications for planning, with the devolved Scottish, Northern Ireland and Welsh assemblies considering the matter separately in the light of regional considerations. For England, DETR has decided to strengthen public consultation requirements on mast proposals of 15 metres and below so that they are exactly the same as applications for planning permission. It has also decided to increase the time for authorities to deal with prior approval applications to 56 days.

FULL LIBERALISATION OF PRIVATE NETWORKS

The Duopoly Review led to extending the use of "class" licences, or "general authorisations", which cover broad categories of activity carried out by a wide range of organisations, obviating the need for an individual licence. No registration procedure or payment of fees is required. The two key ones are:

The Self-Provision Licence (SPL) allows companies and others to set up their own telecommunication systems linking any number of sites up and down the country. All traffic on the system must either originate or terminate with the person running the system and there must be no charge for any telecommunication services provided over the system.

The Telecommunication Services Licence (TSL) allows certain telecommunication services, including the value-added services described below, to be offered to others, so long as all equipment is contained on and linking up to no more than 20 separate sets of premises, where a single set of premises must be within a single contiguous boundary under a common management regime.

OTHER TELECOMMUNICATIONS MARKETS

A wide range of enhanced telecommunication services was developed during the 1980s, termed value-added network services (VANs) and value-added data services (VADs). A substantial market developed for these services, often driven by the need for computer systems to communicate with each other via telecommunication networks. Examples of these services include voicemail, personal numbering, messaging services such as e-mail and voice mail, videoconferencing and information services. The UK has one of the largest markets for these services in Europe. More recently convergence has led to a blurring of the divide between voice and data services and the single term value-added services (VAS) is now in general use.

The UK Government took early steps to liberalise the market for value-added services. The BT Act of 1981 allowed for independent service providers to be licensed to offer VANs in their own right. A year later, the Government issued the first licences to such operators. As a consequence, rapid growth in the market for VANs took place from 1982 onwards. Traditional telecoms VAS are now an integral service offering on most Public Telecommunications Operators' networks, and OFTEL no longer sees a need to encourage a market for these services in its own right.

The Government also sought to allow international conveyance of VANs and VADs without additional conditions. Anyone may provide such services from the UK to foreign countries, subject to the overseas regime, and the UK exchanged letters with the USA, Japan, Australia and Hong Kong clarifying the scope of IVANs (International Value-Added Network Services) which may be provided on a bilateral basis.

During the late 1990s these services have been revolutionised with the introduction of more sophisticated digital technology-based multimedia services which are provided over upgraded or new broadband telecommunications operators' networks. The very nature of the services has changed as the telecoms and IT industries converge. Telecommunications networks of all kinds are increasingly integrated to the Internet, and IT hardware and software are increasingly being seen as telecommunications devices and vice-versa. Software companies have increasingly used Application Service Provision (ASP) software via telecoms networks in 1999 and 2000. The introduction of broadband technology during the late 1990s has led to more sophisticated digital-based services from content and Internet companies. Examples are the multimedia sections of websites for business enabling, and the increasing use of PCs for entertainment and TVs for Internet access, home shopping and voice telephony over the Internet, as convergence of the telecoms, IT and broadcasting industries takes hold. The Government is responding to this fundamental change in the nature and use of traditional telecoms, broadcasting and IT through its Communications White Paper, which is considered later in greater depth.

The Market for Telecommunication Equipment

In 1980, BT still had a monopoly in the supply of terminal equipment in the UK, a situation which had lasted for many years, and the choice of products available to customers was correspondingly limited. In that year, the Government decided to open up these markets to competition. An independent body, the British Approvals Board for Telecommunications (BABT), was established, and BT was required to allow connection to its network of any equipment approved by BABT after testing and approval against defined standards.

BABT's experience of operating approvals procedures in the UK liberalised environment is similar to those required in the more recently introduced European regime, which makes it attractive to both UK and foreign companies as a source of approvals. Competition in the UK approvals field opened up in 1997 with the appointment of the British Standards Institute and Lloyd's Register of Quality Assurance as UK Notified Bodies.

The Radio and Telecommunications Terminal Equipment (RTTE) Directive was transposed into UK law with effect from 8 April 2000. With certain specific exclusions, this new Directive brings radio equipment and telecommunications terminal equipment within the scope of a single measure, defining the essential requirements, and the procedures for conformity assessment, placing on the market and bringing into service. The time and cost of approving and placing new terminals products on the Community market should be greatly reduced by this deregulatory measure.

In practice, except for certain types of radio equipment, the involvement of third parties in conformity assessment is now not necessary in most cases since the person who places equipment on the market will take responsibility for conformity requirements.

The market for customer terminal equipment mushroomed spectacularly in the 1990s because of these policies and given the rapid development of telecommunications technology. Customers can now choose from a range of several thousand items of terminal equipment in a range of styles and colours. Handsets can be purchased from High Street stores for as little as £10.

Liberalisation has also had an effect on the markets for network equipment. The competitive structure which has been introduced into the operation of networks has led to more rapid growth in UK markets for network equipment than in other European markets. The commercial purchasing policies of competing network operators have brought lower prices and faster innovation, to the benefit of end customers.

The Government's policy of encouraging more network competition into the UK has already resulted in a significant number of new entrants licensed to operate in the UK market. The introduction of leading edge technology and high levels of intelligence into the networks of the new entrants will mean more opportunity and choice in the procurement of the software components which make up the bulk of the new networks. This will continue to exert downward pressure on user prices.

The present move towards the convergence of the telecoms, IT and broadcasting sectors means that services in these traditionally separate environments are now conveyed increasingly over common networks and platforms. This is opening the door to many UK suppliers wishing to seek business opportunities in the emerging converged markets for networking and application technology solutions.

The Government is continuing to maintain a technology-neutral policy to ensure that all emerging new technologies will be given every chance to compete in an open market environment. It is likely that future network platforms will comprise a wide mix of technologies and it will be important to ensure that they support via open interfaces a diverse range of new applications and other value-added solutions. Opportunities in emerging technology sectors such as Digital Subscriber Loop (DSL), Internet Protocol (IP), and Asynchronous Transfer Mode (ATM) are materialising and UK suppliers are already positioning themselves to exploit these opportunities in a very fast-moving and changing global environment.

INWARD INVESTMENT

The telecommunications industry has been a major investor in the UK economy throughout the 1990s up to the present, as liberalisation has caused new infrastructure to grow and has brought down prices. This has benefited the UK economy significantly and laid a strong foundation for future economic growth.

Overseas companies have responded to the opportunities opened up by liberalisation by either establishing or investing in competing telecommunication services in the UK. Many large companies have relocated their headquarters to the UK in order to make the best use of the new cost effective telecommunication services available. Companies who have relocated their overseas service headquarters to the UK include US West and IBM. The UK has benefited from these investment decisions through increased growth, investment and employment. Inward investment has been drawn particularly to the UK mobile and cable television markets. Several foreign companies have invested in mobile radio and radiopaging, including Hutchison Whampoa, US West, Telesystems, Bell South Enterprises, Telecoms Systems Mobiles SA, Bouygues and Swedish Telecom. About £12 billion was spent in the 1990s in UK cable. Almost 90% of this was inward investment.

The UK telecommunications manufacturing industry is dominated by inward investors and includes eight of the top ten global manufacturers. These companies manufacture a wide range of advanced equipment, which is at the heart of modern telecommunications, and which contributes significantly to the sector's exports which amounted to £6.5 billion in 1999 (this includes manufacture of television and radio transmitters and apparatus for line telephony and line telegraphy). Motorola, Nortel, Ericsson and Lucent Technologies are four major companies which have established Centres of Excellence in advanced technologies and significant R&D facilities which in some cases are the largest outside their home countries. The UK is now home to R&D clusters in South-East England which are of global significance in driving forward technology advance in this sector.

There is a concentration of world class manufacturers in the mobile communications industry; Motorola, Ericsson and Nokia supply network infrastructure equipment whilst Motorola, Matsushita, NEC and Ericsson have helped the UK maintain a trade surplus in handsets. Motorola's cellular handset manufacturing facility in Scotland has benefited from investment of over £100 million and is now the company's largest manufacturing facility in Europe and second only to the facility in the US.

PRICE REGULATION AND UNIVERSAL SERVICE

The Government believes that the best way of ensuring that the user of telecommunication services receives a fair deal is to promote an open and competitive market. Nevertheless, it recognises that in the short-term at least, competition may not be fully effective for all services.

The Government concluded that post the 1984 privatisation of telecommunications OFTEL should directly regulate BT's prices. Now, in most cases, individual tariffs are not subject to scrutiny, although certain tariffs, particularly bulk discounts, are subject to tighter guidelines. The current price cap was agreed with BT for the period 1 August 1997 to 31 July 2001. The cap is set at RPI-4.5%, and is focused on protecting lower and medium-spending customers, because it focuses on the lowest 80% of residential customers by expenditure. This cap represents significant deregulation, in that 26% of BT's group revenues only are subject to retail price caps as against 64% under the previous four-year cap. That such deregulation has been possible reflects the growth of competition in services to businesses and large

users. Other PTOs are not subject to "price cap" regulation. Under the Network Charge Control, which applies to the charges BT levies on other operators for the use of its network, a cap of RPI-8% is applied to a basket of interconnection services.

The arrangements for regulating BT's prices are regularly reviewed by OFTEL. In January 2001, the Director General put forward a statement with proposals for the control of BT's retail prices from August 2001. The Director General has proposed that the current cap, which is due to end on 31 July 2001, should continue for one further year. He noted that retail competition was increasing in the UK, and that with the advent of further pro-competitive initiatives such as Carrier Pre-Selection, Local Loop Unbundling, further service provider competition and mobile substitution, it was likely to increase further. The Director General will review how competition develops throughout 2001 and into 2002 in order to assess whether further measures are needed beyond July 2002. OFTEL is planning to extend the Network Charge Control until 2005.

The advantage of the price cap mechanism is that it delivers guaranteed price reductions to customers, without unfairly penalising the operator for any efficiency gains that are made. In the case of BT, the success of this measure can be seen in that its main prices have fallen by over 50% in real terms since privatisation.

Universal Service

The objective for universal service is to ensure that those telecommunications services which are used by the majority and which are essential to full social and economic inclusion are made available to everybody upon reasonable request, in an appropriate fashion and at an affordable price. The main requirements are for BT and, in the Hull area, Kingston Communications, to provide a telephone line on reasonable request; special tariff packages to assist those people with special social needs, particularly those on low incomes, or who live in remote rural areas that are expensive to serve, to obtain basic telephony, disconnection procedures which provide people with adequate opportunities to pay bills, and geographically averaged prices. An independent survey undertaken on behalf of OFTEL in March 2000 found that an average of 5 per cent of the UK population live in homes that do not have a fixed line phone, a fall of 14 per cent since the early 1980s. This is due to a combination of increased competition and innovative measures introduced under universal service to make the use of a telephone more attractive to low-income users.

The current level of universal service was established for a four year period. A mid term review was undertaken in 1999 to establish the level of service from September 2001. The future scope of universal service has become a major issue with the launch of new products and services. The fixed analogue network gives 95% of homes the potential to access the Internet and innovative charging packages are promoting Internet use. It is likely that the minimum data speed requirement will be raised to ensure that all users have the potential for workable and reliable Internet connection. High bandwidth services do not currently meet the primary test for consideration as part of the Universal Service Obligation requirement because they are not yet services used by the majority. However, OFTEL intends to keep this under review as the market changes.

4. INTERNATIONAL DEVELOPMENTS

AN OVERVIEW

Telecommunications has entered a period of unprecedented global growth created by technological change and the unleashing of market forces. This contrasts with the situation in the early 1980s when the UK was virtually alone in removing the monopoly held for the previous 60 years by British Telecom and its predecessor, the Post Office. Recognising the long term benefits of open markets and competitive services, many other countries have followed the UK example and gone down the route of market liberalisation. In 1998 there were two major milestones in that trend.

Firstly, most EU telecommunications markets were fully liberalised from the beginning of that year under a package of legislative measures. Secondly, the World Trade Organisation's Basic Telecommunications Agreement came into force in February 1998. This agreement - the first of its kind, with binding commitments by 69 states - not only established competition as the norm rather than the exception in telecommunications but also served to accelerate the globalisation of the industry in guaranteeing market access on fair terms.

EUROPEAN COMMUNICATIONS MEASURES

With the arrival of the full liberalisation of telecoms in the majority of the Member States of the European Union on 1 January 1998, a 10-year process of harmonisation and liberalisation was completed. The effects of liberalisation are now beginning to be felt as new players come onto the market, quality improves and the prices of many services fall in real terms. Mobile communications and on-line services, notably via the Internet, are seeing continued strong growth as telephone companies compete with each other to offer new, combined, fixed/mobile packages and cheaper second phone lines as well as new pricing formulæ and new ways of paying for services.

However, the transition from a monopoly world to a fully competitive one has not been easy. Detailed rules set out in seven liberalising measures and 14 harmonised directives have been needed to produce concrete effects.

The national regulatory authorities for telecoms, established in all Member States, have been set a range of tasks by the EU regulatory framework, including the granting of new licences, approving interconnection prices, policing prices charged to customers for changing operators and examining alleged anti-competitive behaviour.

Complete information on the 1998 liberalisation package can be found in the Commission staff working document *Europe's Liberalised Telecommunications Market—A Guide to the Rules of the Game* available at http://europa.eu.int/ISPO/infosoc/telecompolicy/en/userguide-en.pdf.

The achievements of the current framework have been impressive, but the process is not complete. The European telecoms market cannot yet be described as truly pan-European, although increasing numbers of operators are pursuing a pan-European business strategy. Incumbent operators remain dominant in their national markets, where new entrants have so far made only minor inroads.

In anticipation of the convergence of the telecoms, broadcasting and IT sectors and increasing globalisation, the Directives that make up the 1998 package called on the Commission to undertake a review of its operation within two years. This "1999 Communications Review" led to a public consultation and the conclusion in April 2000 that there was a need to remove existing barriers to the single market, to re-orientate the regulatory framework to address an era of increasing competition and to ensure technological neutrality of provisions. The Commission also set itself the task of reducing sectoral regulation where it was no longer necessary.

In order to achieve this, the Commission adopted seven legislative proposals on 12 July 2000 for subsequent negotiation by the European Parliament and the Council:

- a **Framework Directive** setting out the horizontal provisions of the new regulatory framework. This would define the powers and duties of National Regulatory Authorities (NRA)s, promote uniform application of the rules by requiring consultation with the Commission on key decisions, establish the threshold and mechanism for regulatory intervention, facilitate market-led technical standardisation, and reform the institutional structures that bring the Commission, national regulatory authorities and Member States together;

- an **Access Directive** establishing a framework for access interconnection agreements between operators of electronic communications networks and associated facilities. This would define the rights and obligations of operators and establish the nature of regulatory obligations and the conditions under which they can be imposed;

- an **Authorisation Directive** harmonising the rules for authorising the provision of electronic communications services. This would require national regulatory authorities to operate a general authorisation for operators rather than individual licences, and restrict the circumstances in which conditions can be imposed on operators to the use of scarce resources (spectrum, numbers and wayleaves).

- A **Universal Service & Users' Rights Directive** setting out users' rights, particularly in respect of universal service. This would define the scope and financing of universal service and provide for the possibility of future revision, permit retail-price regulation, and address consumer benefit concerns.

- a **Communications Data Protection Directive** updating existing legislation in the light of technical developments. This would guarantee confidentiality of communications, enable traffic and location data to be used for value-added services with user consent, and address unsolicited electronic communications of all types;

- a **Spectrum Decision** establishing a framework within which harmonisation can take place in order to further other Community policies in communications, transport and R&D. This would establish institutional structures to bring the Commission and Member States together, greatly extend the scope of existing mechanisms for harmonising spectrum allocation, ensure the availability of information and provide for Commission representation of the Community in external fora; and

- a **Competition Directive** consolidating existing legislation that prohibits exclusive and special rights in the electronics-communications sector. This will be a Commission Directive on which the Parliament and the Council will have the opportunity to comment but not, unlike the remainder of the legislative package, negotiate.

An additional **Local-Loop Unbundling Regulation** was also adopted by the Commission - and subsequently agreed by the Parliament and the Council in November 2000 - requiring dominant operators to provide third parties with unbundled access to their local loops from 2 Jan 2001.

The Lisbon European Council called in March 2000 for these legislative measures to be agreed as soon as possible in 2001 in the context of the wider *e*Europe initiative. Negotiations are now under way in both the Parliament and the Council, and the new regulatory framework for electronic communications is expected to enter into force around 1 January 2003.

On satellite services the Commission is working closely with industry to remove regulatory hurdles and solve problems without necessarily introducing new measures. Specifically, the Commission has been participating in CEPT projects working to harmonise the authorisation of satellite services across Europe. A good example is the One-Stop-Shop (OSS) for satellite licences which has been developed and is housed by the European Telecommunications Office (ETO) in Copenhagen. It allows applicants to use one single form as opposed to applying for licences individually in each country, which can be a lengthy, burdensome process. The shop became operational in October 2000 and the arrangements will increase in effectiveness as more and more Administrations commit to the OSS arrangements. Other satellite harmonisation initiatives are also being pursued vigorously aiming among other things at a harmonised approach to frequency management and co-ordination across Europe consistent with ITU regulations.

INTERNATIONAL STANDARDISATION

Inter-operability is essential to telecommunications and the creation of agreed technical standards is essential to the international development of telecommunications. Such standards also bring great benefits in terms of enlarged markets and thus economies of scale; but their creation needs to be done in a way which is consistent with open and competitive markets. In the past, standards-making was sometimes dominated by monopolistic national public telecommunications operators. In order to promote a more open and dynamic formulation of standards, the UK played an active role in the creation of ETSI (the European Telecommunications Standards Institute), which, since its birth in 1988, has been the forum for the creation of European telecommunications standards. Its membership is now over 780, spread throughout 36 countries, and includes all the main European manufacturers, PTOs and administrations, as well as many smaller operators, manufacturers and users. The UK, through DTI's membership, has played an active role in ETSI and has sought to influence standards-making in such a way as to maximise the possibilities for liberalisation. Examples of its success have been the standards agreed for GSM and PCN. UK network operators, manufacturers and other members comprise over 25% of ETSI total membership and have been active in its standards-making activities. The UK is also in the forefront of the development of a new multi-track production process for standards and specifications to meet the needs of the converging markets. More than 5000 ETSI deliverables have either been published or are in preparation. The UK also participates in standards-making at the global level through its activities in ITU-T and ITU-R, the Standardisation and Radiocommunication Sectors of the International Telecommunications Union.

INTERNATIONAL LIBERALISATION

Telecommunications is at the heart of the modern global economy. The globalisation of national economies and the increasing importance of telecommunications as essential infrastructure to facilitate trade in goods and services have generated enormous growth in international voice and data services. As basic telecommunications has been liberalised and technological developments have provided higher capacities at lower costs, this has increased pressure for reform of the way in which incumbent operators pay each other for the delivery of international calls.

Under the accounting rate regime, when an international call is originated on an operator's network in one country, it must be passed to an operator in the destination country for delivery to the number dialled and a payment made for termination. Typically the negotiated rate for this service (known as the settlement rate) is the same in each direction. Over time the rates charged by monopolies to each other have become inflated and ceased to reflect actual costs.

Following EU liberalisation in 1998 and the 1997 WTO Basic Agreement (see below), new operators in liberalised regimes have used alternative, cheaper methods of terminating calls by self-termination, international simple voice resale (ISVR) and cross-border interconnection, and have been able to pass on the benefits to their customers and this has put severe pressure on the level of accounting rates on liberalised routes. However, on other routes, accounting rates have fallen only slowly and prices charged to consumers have remained relatively high as a result. Further, on non-liberalised routes, there has been growth in a number of alternative ways to by-pass the accounting rate system such as callback services (illegal in some countries) and Internet telephony.

There is resistance to reductions in accounting rates from those countries which receive more calls than they originate and consequentially receive much more money than they pay. These international revenues are for some countries a major source of foreign exchange and have traditionally been used to subsidise domestic calls and network expansion.

The UK continues to support efforts to bring accounting rates into line with costs and to promote the implementation of free market policies internationally whilst at the same time encouraging more appropriate forms of funding for network expansion in the developing world.

The comparative lack of competition in other countries was a problem for the UK while it was forging ahead. As explained above, the UK has sought to exert downward pressure on accounting rates by liberalising international simple resale (ISR), allowing the provision of basic voice and data services to third parties over an international leased line. This has been a spur to competition and reducing tariffs and accounting rates on a number of routes. Now, International Simple Voice Resale (ISVR) providers and PTOs are subject to a "proportionate return" condition which requires them to provide information on request to the Director General of Telecommunications on flows of traffic to non-liberalised countries or territories. The DGT has a safeguard power of applying a ratio of inbound and outgoing traffic on such routes if he deems it necessary.

Now, however, regulatory barriers in telecommunications are coming down all over the world. In Europe full liberalisation of all services took effect from the beginning of 1998. The US has been liberalised for some time. In Japan foreign ownership rules have been relaxed and more competition allowed. In many other Asian and Pacific countries, we are seeing a trend towards deregulation and market liberalisation.

The landmark agreement on 15 February 1997 by 69 members of the World Trade Organisation (WTO) to open their basic telecoms markets to competition marked the successful end of negotiations (under UK chairmanship) to extend the General Agreement for Trade in Services (the "GATS") to basic telecommunication services. The agreement (which came into force on 5 February 1998) not only provided a framework for the gradual liberalisation of market access but also established a framework of basic regulatory principles (such as measures to prevent anti-competitive behaviour and non-discriminatory and timely provision of interconnection at cost-oriented rates) to which the majority of countries also committed themselves.

For those countries at present negotiating accession to the WTO, the agreement gives a clear framework within which to address the reform of their own telecommunications market.

5. LOOKING TO THE FUTURE

CONVERGENCE

It has been recognised for some time that the telecoms, broadcasting and IT industries are converging. Digital media are revolutionising the telecommunications, broadcasting and IT sectors and bringing them together, so that services which used to belong clearly to the one sector are now being delivered by another and vice versa. Thus people now use their TV sets to email, shop from home, access the Internet and devise their own personal viewing schedules. And they are using fixed telephone lines and mobile phones as well as computers to access the Internet. Telecommunications companies want to become broadcasters, while broadcasters increasingly are moving into e-commerce, and Internet Service Providers are offering television channels. The type and range of content available to consumers depends on the competitve environment in this converging sector. At the same time, the type of content that broadcasters carry in turn affects the market itself. This means that economic regulation of the market and regulation of content need to go hand in hand and the regulatory framework needs to consider both the content and the way it is carried to people.

COMMUNICATIONS WHITE PAPER

The Government published a White Paper in mid December 2000 in order to meet the challenge of convergence and update the UK's communications regulatory regime for future technological developments.

The White Paper sets out the Government's proposals for reform of the framework of communications legislation. The Paper covers both infrastructure and content issues and includes proposals for changing the Telecommunications Act 1984, the Broadcasting Act 1996 and the Wireless Telegraphy Act 1949 as a basis for legislation, when Parliamentary time allows. Sector-specific regulation will be based on a new common framework for the regulation of electronic communications networks and services which we are currently negotiating in the European Community (see Chapter 6 under European Communications Measures). This represents a step change in the regulatory approach. The centrepiece of the paper is the creation of a single regulator for the communications industries, the Office of Communications (OFCOM), instead of the present nine regulators covering radio, television and telecommunications.

ROLE OF OFCOM

OFCOM will be an independent regulator, working at arm's length from Government, and will cover both content and communications networks across telecommunications, television and radio. It will promote competition and manage spectrum.

It will preserve the role of public sector broadcasting and media ownership rules designed to prevent undue dominance in broadcasting. Taking full account of the differences between services and people's expectations of them, OFCOM will be responsible for maintaining content standards in the electronic media. It will develop Codes of Practice underpinned by statute for the most pervasive broadcast services, and work with industry to ensure effective co- and self-regulatory approaches to regulating content for other services, such as the Internet, where they are more appropriate.

OFCOM will have a primary duty to protect the interests of consumers and will have powers to take action if the industry does not develop an effective consumer protection regime. A new consumer panel will advise the regulator, and will be able to research consumer views on service delivery, represent these concerns to OFCOM and other relevant bodies, and publish its findings and conclusions. The White Paper challenges the industry itself to draw up an effective code or codes or practice for service delivery, but OFCOM will be empowered to institute consumer protection if the industry fails to satisfy requirements. Complaints about service standards which are not resolved will be handled by an industry-sponsored ombudsman scheme or an equivalent mechanism instituted by OFCOM.

Complaints about content which the content provider fails to resolve are a separate matter and will be handled by the regulator. OFCOM will be required to give due weight to the need for improved access to communications services for people with disabilities.

6. RECENT DEVELOPMENTS IN MARKETS AND SERVICES

By the end of September 2000, since the end of the Duopoly Review the Government had received 823 applications for licences to run new telecommunication systems in the UK and had granted 632 licences. 102 were under consideration. There are now some 140 Public Telecommunications Operators (PTOs) providing domestic and international telecommunication services. Many fixed operator licences were cable licences which have now been consolidated into the operations of two large operators (MSOs). There now exists extensive alternative infrastructure to BT, providing many consumers with a choice of telecommunication services.

Applications cover all types of services, from mobile operators who wish to include fixed links into their systems to proposals to provide full-scale network competition to BT. The proposals have applied many different and novel technologies, including advanced digital-fibre networks, new radio-based systems, satellite systems and intelligent networks. Brief details of applications made and of licences granted are available in the Register of Licence Applications from OFTEL's Research and Intelligence Unit, where copies of issued licences can also be obtained.

Internet access is fast becoming one of the major types of traffic carried over telephone networks. Consumers have been seeking low cost access to the Internet, and the UK was the first country to benefit from subscription-free Internet access, offering dial-up access for consumers for the price of a local call. Further developments came at the end of 1999 when BT announced they would be launching their SurfTime unmetered Internet access package. This package, which was launched in June 2000, offered unmetered Internet access at all, or certain times of the day for a fixed monthly fee.

Many other ISPs offered unmetered packages throughout 2000, with varying degrees of success. Following a request for determination, OFTEL issued a direction requiring BT to make available an unmetered wholesale Internet access product (called Flat Rate Internet Access Call Origination (FRIACO), which allows ISPs to offer unmetered products using a more appropriate business model. Following the initial determination and further industry discussion, OFTEL proposed, in November 2000, further developments to FRIACO to allow even more flexibility in how this wholesale product can be used. A number of ISPs, including AOL, Freeserve and BT Internet have already launched FRIACO-based services, and more are expected to make similar offers soon.

Restrictions on BT and other PTOs from providing broadcast services to homes have been progressively removed since 1998. From 1 January 2001 they have been able to compete in broadcast TV services throughout the country. PTOs and other independent service providers can now plan future services with certainty, while cable companies can continue to finance investment in broadband networks, providing strong competition to BT.

BT has now rolled out Asymmetric Digital Subscriber Line (ADSL) technology to over 600 local exchanges, covering around 40% of the population. As a result, a number of wholesale ADSL products are available from BT to operators and service providers to make services such as high-speed Internet and video-on-demand available to end users. BT intends to cover 70% of the UK's population by the end of 2002. The Government recognises that this represents a significant investment by BT and welcomes this commitment to the provision of broadband access technology.

The Government also wants to encourage other operators to provide further competition in higher bandwidth services. Following a major consultation by OFTEL, BT is now required to offer

unbundled local loops to its competitors. The latter will be able to site their equipment in BT exchanges or, if they prefer, at nearby premises and connect that equipment to BT loops. They will be able to provide higher bandwidth services using DSL technology over those loops, either in conjunction with their own telephony service or independently of BT's telephony service.

Four trial sites are now in operation. BT is in the course of preparing detailed plans and costings to facilitate co-location at several hundred further exchanges and will survey others, as demand occurs. Unbundled loops will be made available at such exchanges as soon as the competitors' equipment has been installed. BT has committed to offering co-location at 600 exchanges by July 2001, subject to receipt of satisfactory orders.

BT is also required to give other operators access to their upgraded system on non-discriminatory terms. The first such "bitstream" services have been available since the summer of 2000 in all exchanges where BT has installed its own DSL equipment. OFTEL is currently investigating whether a greater range of such services should be available to competitors, to complement unbundled loops.

The Government welcomes these developments as an important step towards increasing competition in the area of network provision and increasing the spread of broadband services across the UK. In February 2001 the E-Minister Patricia Hewitt announced a £30 million fund to assist the devolved Scottish, Welsh and Northern Ireland administrations, and Regional Development Agencies, to develop innovative schemes to meet local requirements for extending broadband networks. This should help spread high-speed Internet access to more rural communities over the next three years.

The Government is also committed to other new broadband technologies which can substitute for or compete with DSL, especially in areas where ADSL is not available. This is why the Government recently auctioned spectrum to a number of bidders at 28 GHz for Broadband Fixed Wireless Access in urban and suburban areas, and intends to make available spectrum at 40 GHz, 3.4 GHz and 10 GHz in 2001.

Mobile wireless access is likely to be a further means of spreading broadband services. Network enhancements such as WAP (Wireless Applications Protocol) and GPRS (General Packet Radio System) support higher data rates, and 3rd Generation mobile or UMTS, due to be launched around 2002, will support data rates up to 2Mbits/s.

Cable companies can also offer access speeds comparable to ADSL, by using Cable Modem technology. NTL and Telewest are both rolling out their cable modem offerings priced around £40-£50 per month depending on the operator.

A number of providers offer high-speed Internet access via satellite to consumers. Some services use a traditional dial-up ISP to request information which is then delivered over the satellite network at high speed (typically offering data rates up to 2Mbit/s). Other services offer access solely using the satellite system.

7. THE INFORMATION SOCIETY

ELECTRONIC COMMERCE

The Government aims to make Britain the best place to trade electronically within the next two years. It has produced an Electronic Communications Act in order to facilitate Electronic Commerce in the UK. The Act promotes electronic commerce in three main ways:

- by clarifying the legal position of electronic signatures;
- by building trust in the providers of cryptography services;
- by giving Ministers the power to sweep away obstacles in existing laws which insist on the use of paper.

The Government has also set a target for100% of Government services to be delivered electronically by 2005.

UK ONLINE

In addition to the Electronic Communications Act, The Government's 'UK online' campaign is a cross-Government programme intended to ensure that everyone in the UK, residential end users and businesses alike, will have access to the Internet, and to make sure the UK remains one of the world's leading economies in the Information Age. Specific aims are:

- to make the UK the best environment in the world for e-commerce by 2002;
- to ensure 'universal access' to the Internet by 2005; and
- to have 100% of Government services available online by 2005.

The programme involves Government-funded schemes to promote the use of electronic communications and the Internet at every level of UK society, working with partners in the public, private and voluntary sectors. A key element in this was the creation of an E-envoy position in 1999. He oversees "UK Online" and works closely with the DTI Minister responsible for electronic communications, the E-Minister.

As part of *UK online,* in 2000 the Government announced 3 key packages focusing on:

Getting people online

In 2000 the first 600 UK online centres in deprived areas were named (by DfEE), where anyone can get training in how to use the Internet – the aim is to achieve over 6000 UK online centres by 2005 including all public libraries.

DfEE's Learndirect facility is a telephone helpline set up to help adults with learning and careers queries. Its main role is to provide information on the availability of all UK learning opportunities. LearnDirect is currently moving into the delivery of courses online – available to anyone at home, at work, or in one of the 1000 LearnDirect centres opened in April 2000. By 2002 it will aim to provide

1m courses a year. Further details about Learndirect can be obtained from the DFEE's website at http://www.dfee.gov.uk.

Getting business online

"UK online for business" (DTI) was launched in 2000 as part of "UK online". Built upon the former Information Society Initiative set up in 1996, the programme is backed with £10m and a further £15m over the following 2 years. UK online for business will help companies exploit new technologies by providing help and advice face to face, online or by phone.

Getting Government online

£1bn will be invested in electronic service delivery over the next 3 years with the creation of a UK online citizen portal (Cabinet Office), which has just got off the ground at the time of going to press – in the next few years it will have developed to offer all Government information and services 24 hours a day, seven days a week, 365 days a year.

A new Performance and Innovation Unit report was published in 2000 on e-Government setting out the blueprint to get all Government services online by 2005.

More information about UK online can be obtained from the UK online website at: http://www.ukonline.gov.uk.

UK Online for Business

One important element of UK online is making sure small businesses keep up with the fast- moving nature of e-commerce and embrace the business benefits of trading online. The DTI-led **UK online for business** (formerly known as the Information Society Initiative) has made and continues to make an important contribution in reducing barriers to SMEs accessing new technology by providing a forum to learn and share ideas and best practice.

Working with the Small Business Service (SBS), UK online for business delivers its services through a national network of UK online for business advisers in over 100 centres to whom SMEs can turn for impartial, jargon-free advice in person, online, and through a telephone Infoline.

UK online for business works with a range of organisations in the private and public sector and is facilitated through the Partnership Programme. Major projects include the Technology Means Business programme, an accreditation and support system for all those who give advice to SMEs on the effective use of Information and Communications Technology, and the SBS national website providing online advice.

Extra funding for UK online for business, as announced in the Budget 2000, will support additional advisory capacity through the UK online for business network of advisers, and boost awareness and marketing activities including an upgraded helpline and further development of the multi-channelled Partnership Programme to enhance ways of reaching SMEs.

More information about the various UK online for business initiatives can be obtained from the website at: www.ukonlineforbusiness.gov.uk.

ANNEX 1 - KEY FEATURES OF THE 1984 TELECOMMUNICATIONS ACT

1. DUTIES OF THE SECRETARY OF STATE AND THE DIRECTOR GENERAL OF TELECOMMUNICATIONS

The general duties of the Secretary of State and the Director General of Telecommunications are set out in Section 3 of the Telecommunications Act 1984. These include:

- to secure that all reasonable demand for telecommunication services is satisfied, including emergency services, public call box services, and others;
- to promote the interests of consumers, purchasers, and other users in respect of prices, quality and variety of telecommunication services and apparatus;
- to maintain and promote effective competition in telecommunications;
- to promote efficiency and economy, and
- to promote research and development of new techniques and their use.

The Secretary of State for Trade and Industry also has duties and powers under relevant acts such as the Wireless Telegraphy Acts.

2. FUNCTIONS OF OFTEL

The Telecommunications Act 1984 established the independent regulatory body, the Office of Telecommunications (OFTEL). This is a non-ministerial government department (like the Office of Fair Trading), under a Director General of Telecommunications who, for the duration of his appointment, is independent of ministerial control.

The current Director General is David Edmonds. His staff are drawn from both the public and private sector to provide expertise from a wide range of sources. Around 190 currently work at OFTEL. The cost of OFTEL's activities is funded largely from licence fees, which in the case of the largest PTOs are broadly related to the size of turnover of the licensed business.

OFTEL has sole responsibility for the monitoring and enforcement of all classes and types of telecommunications licences. OFTEL also has responsibility for modifying the terms of existing licences, either by agreement or after a reference to the Monopolies and Mergers Commission.

The Director General is also responsible for the enforcement of competition legislation, in particular the Fair Trading Act 1973 and the Competition Act 1998, in relation to telecommunications.

In addition he has the function of giving advice to the Secretary of State on request or on his own initiative. He can also arrange for the publication of information where he thinks it would be useful.

Finally, the Director General has the duty to investigate complaints and take such action on them, within his functions, as he sees fit.

ANNEX 2 - USEFUL ADDRESSES

OFTEL's address is:

The Office of Telecommunications
50 Ludgate Hill
London
EC4M 7JJ

Tel: 020 7634 8700.
Internet: http://www.oftel.gov.uk

The address of ETSI is:

ETSI
06921, Sophia Antipolis
Cedex
France

Telephone: + 33 92 94 42 00
Fax: + 33 44 93 65 47 16
Internet: http://www.etsi.org

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