Strategic Review of Telecommunications

Phase 2 consultation document

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Five fundamental questions from Phase 1

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5. At varying times since 1984, the case has been made for the structural or operational separation of BT, or the delivery of full functional equivalence. Are these still relevant questions?

Foreword

Telecommunications is an important economic sector in its own right. It also has a growing impact on our lives as individuals, on businesses in terms of efficiency and customer service and on the United Kingdom's competitiveness as a knowledge-based economy.

The telecommunications sector and the communications services we get have been heavily shaped by regulation. In mobile and wireless services, this has been achieved through the allocation of the radio spectrum on which these services depend. That has been a series of regulatory decisions. In fixed line telephony, the 20 year march from a single, state-owned, monopoly towards competitive markets has been enabled – though also sometimes unintentionally diverted – by economic regulation.

The technology behind telecommunications services is at an inflection point. Telecommunications is going from analogue to digital, just as surely as is broadcasting, and probably with even more significant consequences, though they are not as widely recognised or understood. Some of this shift is evident to residential and business consumers, with the growing deployment of broadband, ICT solutions and 3G mobile. Some is less evident, involving the transformation of back office operational support systems and the design of core networks from analogue switched voice, to digital IP-based data. The impact of these changes, on the services we are able to receive and on the economics of the sector will, however, be profound. And while these changes are underway, it will be particularly important to ensure that a safety net of universal service remains available for all.

So Ofcom has undertaken a Strategic Review of the sector with the aim of reassessing the regulatory framework to make it fit-for-purpose against this changing backdrop. In Phase 1 of our Review we posed five questions which the Review would address. These are replicated on the page opposite. We also charted the evolution of regulation and the current state of the market. This Phase 2 Ofcom report builds on that work and sets out our proposals for a future regulatory strategy.

The regulatory framework has developed in three stages since BT Group plc was privatised, as an integrated entity, in 1984. The first stage was based around retail price controls, designed to protect the consumer from monopoly pricing whilst also intended to encourage the company to make increasingly efficient use of assets as nascent competition developed. In the second stage, which followed the last strategic assessment of the sector – the duopoly review in 1991 – the emphasis shifted towards encouraging end-to-end infrastructure competition, with the roll-out of the cable networks. In more recent years, as the limits of end-to-end infrastructure competition were realised and with the emergence in other markets of service-based competition models, the regulatory framework focused increasingly on the provision of access, at the wholesale level, to BT Group plc's network and facilities. And, most recently, the system of detailed market definition and reviews, assessment of

significant market power and detailed remedies, created by the series of European Communications Directives, was transposed into UK legislation.

In that 20 year period, the telecommunications sector has delivered for the residential and business consumer. No longer are there waiting lists for residential lines. UK call prices – local, national and international – are amongst the lowest in the world. Mobile telephony has been a success, developing from a standing start in 1985 to over 80% penetration now. The UK today has over 5 million broadband connections, delivered over DSL or cable networks, with five major retail providers. For businesses, the development of VPNs, LANs and WANs has created bespoke data-based options providing both improved service efficiency and significantly lower call costs.

In terms of competitive market structures, mobile is strong with five competing operators and several more virtual network operators. In almost all aspects, the mobile sector displays the hallmarks of a vigorously competitive market. Its evolution will be conditioned more by developments in wireless spectrum use and availability, which we will address separately in our forthcoming Spectrum Framework and Implementation Plan, than by this Telecommunications Review.

The fixed line market, however, remains fragmented. In terms of revenues, market capitalisation and investment, BT Group plc remains larger than most of its competitors put together. Understandably, fixed infrastructure competition has followed the margin in the system, with competition to BT Group plc (apart from in cabled areas) focused on core and backbone networks. However, the technology shift to IP-based networks requires new investment, to supply what are likely to be products with lower margin than was available in the legacy products and services. There is little appetite for new investment to compete with BT Group plc at the local access level, and in some areas even in backhaul from the Local Exchange to the core network. This is a challenge.

Past regulatory attempts to secure fair access at wholesale level to BT Group plc's networks and facilities have also led to a large and growing range of detailed regulatory interventions, and at times regulatory micro-management of BT Group plc at different points in the value chain, which can set conflicting incentives both for BT Group plc and its competitors and encourage commoditised competition on the basis of regulatory arbitrage.

Faced with the technology shift to digital, it is becoming clear that the current market and regulatory structure is unsustainable. It is that challenge that our Phase 2 proposals seek to address.

This report seeks to address the five key questions that Ofcom posed for the Review. Firstly, in terms of the characteristics of a well functioning competitive market for both residential and business customers, keen prices, wide availability and reliability of basic voice and data services – guaranteed by a choice of suppliers – remain

important. But innovation, range and choice in new services are increasingly prized; and the infrastructure that will support them consequently becomes more important. Purely arbitrage-based services are likely to have a limited life-span. The objective is sustainable competition. The increasing choice of new services and tariffs will also put a premium on effective customer information and the ability to switch easily between providers.

Effective and sustainable competition can be achieved in core and backbone networks, provided careful attention is paid to ensuring a successful migration of today's interconnection regime to the very different topography that IP-based networks imply. In local access and other wholesale access products, efficient and sustainable competition is likely to require some continuing regulation to secure genuine equality of access, right through from product design to customer handover. Such regulation needs to be focused on a more limited range of wholesale products than to date – where there are real bottlenecks that are likely to endure. However, where it is focused, it also needs to be more intensive than hitherto. Such an approach, of much more tightly focused but intensive intervention to guarantee genuine equality of access through key bottlenecks, also creates real scope for a significant withdrawal from sector-specific regulation.

Regulators cannot create investment, nor are they well placed to determine when and how much. That is for the industry and the market. However, the proposals in Ofcom's new regulatory framework will, we believe, encourage investment in scale and reach by BT Group plc's competitors to the deepest possible point of connection with BT Group plc's network. This should ensure that there is an increasing range of services and supply for sustainable competition from last-mile delivery right through to retail services. For BT Group plc's own network investment, Ofcom's framework contains a range of instruments and decisions – such as the review of the Network Charge Control, the valuation of BT Group plc's local loop assets, and the question whether there should be a single weighted cost of capital – to ensure that BT Group plc is able to reap an appropriate rate of return – one which recognises the risks involved in next generation networks.

On the final question posed – whether structural or operational separation of BT Group plc, or full functional equivalence, still remained relevant issues – the answer from the Phase 1 consultation was that, yes, they were still relevant; more so perhaps than we had anticipated. However, the large majority of industry respondents expressed caution about the prolonged uncertainty and disruption to the sector that would be involved in the process which would determinatively answer the structural separation question, namely an Enterprise Act market investigation and subsequent referral to the Competition Commission. If genuine equality of access could be made to work, the overwhelming majority of responses suggested that it would be a far preferable outcome. Equally, however, they shared Ofcom's view that the status quo was unsustainable.

We are at a critical point. There is a genuine opportunity for players in this market, BT Group plc in particular, both to make progress and to benefit the consumer. But

market structure and technology development make it a time-limited opportunity. The response of the key players in the market in the coming months will determine whether the sector generally can take advantage of this opportunity, for the benefit of consumers and citizens, and the UK as a whole.

This then is an important consultation. It will run until 3 February. Ofcom will publish the final statement of its regulatory strategy next spring. If responses to the consultation, and market developments between now and then, support and bear out Ofcom's currently preferred course, then a series of specific regulatory – and deregulatory – actions will follow during 2005. If, on the other hand, we must conclude that a more fundamental examination of the market structure is required, then we will consider making an Enterprise Act reference. We do urge you to let us have your views.

David Currie, Chairman **Stephen A Carter, Chief Executive**

1. Executive summary

1.1 In December 2003, Ofcom (the Office of Communications) announced a Strategic Review of Telecommunications (the 'Telecoms Review'), to take place throughout 2004. The Review is taking a broad look at the workings of the UK telecoms sector. It is assessing the benefits the sector is currently delivering to consumers, the sector's future prospects and the potential impact of alternative regulatory approaches. The outcome of the Review will be a new strategy for telecoms regulation.

1.2 This document is our Phase 2 consultation document, and it sets out our proposals for a future regulatory strategy. We are publishing this document later than we said that we would. The delay reflects our need to consider the large volume of responses to our Phase 1 consultation (we received over 100), the level of interest in the Review among all our stakeholders and the critical importance of this Review.

The telecommunications sector is undergoing very rapid change

1.3 There is a very substantial potential prize for citizens and consumers from the future telecommunications industry. Many respondents to our Phase 1 consultation described an exciting world in which telecommunications underpin radical changes in the way we work, in the way we communicate and the way in which we educate and entertain ourselves. Mobile, wireless and fixed services have the potential to provide a diversity of new services, offering users pervasive, seamless high-speed connectivity. Networks and the information they carry will become more pervasive and ever more central to our economic and social experience in the 21st century.

1.4 The Phase 1 consultation confirmed our view that the telecommunications sector is undergoing a period of very rapid change. The utility-based industry of the past, which delivered largely uniform products, is evolving into an industry characterised by complexity, multiple platforms and ever more diverse products. We are at a critical point of technological change in this evolution. Telecoms operators are currently designing next generation *core networks* (the central infrastructure at the heart of their networks). These next generation core networks will be based on packet-switched technology which will require substantial new investment. The proposed 21st Century Network of BT Group plc (BT[1]) is one such network. Many believe that we are also reaching the point at which higher bandwidth next generation *access networks* (the edge of the network, closest to the customer's premises) will be required.

1.5 At the same time, the telecoms sector is converging rapidly with the media and IT sectors. For example, when telecoms network operators tender for contracts from large business customers they increasingly compete against systems integrators such as IBM and EDS. If an innovative operator wishes to offer a package of broadband, on-demand video and telephony, all

[1] Throughout this document we use 'BT' to mean BT Group plc

delivered over telecoms networks, success would depend not only upon access to the network but also on the availability of content rights.

1.6 In parallel to this technological evolution, the attributes of a well-functioning market are also changing. Residential consumers and businesses are increasingly diverse, and what they require from telecommunications is changing. In the past, the key aims of telecoms regulation were low prices, wide availability and high quality of service for a relatively uniform product. Increasingly, continuous innovation in new services is important too – and many sectors of the industry have been very successful at delivering this. Our research shows that consumers increasingly also want a sufficient choice of suppliers, and they need the information necessary to make effective choices between them. They want it to be easy to switch between multiple services and devices, which implies a range of seamlessly connected alternative networks.

1.7 Many Phase 1 responses also emphasised the increasing importance of timely investment in leading-edge telecoms services to the competitiveness of the UK economy.

The telecommunications industry has delivered good products, choice and value to consumers, but now faces fundamental challenges

1.8 Our Phase 1 analysis showed that in general the telecoms industry today is delivering relatively good products, choice and value to citizens and consumers. Our call prices are among the lowest in the world. The UK has over five million broadband connections, delivered over both DSL and cable, from a range of retail providers. Competition in fixed line telecoms continues to grow, with some 4.2 million lines using carrier pre-selection (CPS) by the end of September 2004. Large businesses in particular have a wide range of telecoms operators competing for their custom. There are nearly 300 service providers using BT's Wholesale Line Rental product to provide business voice services.

1.9 The problem for citizens and consumers is not what the sector is delivering today; it is what it will be able to deliver tomorrow. Our challenge is how the industry's achievements today can be sustained and enhanced in the future.

1.10 In mobile, the prospects look good. There is competition between five network operators, as well as service providers purchasing capacity in the wholesale market. The UK's first commercial 3G service, 3UK, has recently announced that it has over one million active customers in the UK. In addition, Ofcom is working to reduce barriers to entry in the provision of wireless services. We will shortly publish consultation documents explaining our approach to the overall management of spectrum[2], including an implementation plan setting out proposals to open up the market for spectrum and create the scope for further competition. Wireless technologies may in future be used to deliver a much greater range of telecoms services than today; for example, next generation broadband access to some types of consumers.

[2] Ofcom's Spectrum Framework Review will be published shortly

1.11 But the fixed telecommunications industry now faces fundamental challenges. In the 1990s in particular, although almost all of BT's competitors were loss-making, investment funds flowed into the industry in the expectation of increasing demand and high, sustainable margins. Up to now, much of the competitive advantage that BT's competitors have enjoyed – which held the prospect of such margins – has come from four sources. Many of BT's competitors:

- have been able to operate more cost efficiently compared to the once-nationalised incumbent;
- have targeted products, such as international calls, where high margins resulted from a lack of competition;
- built newer networks which often leapfrogged BT's technology, and used higher functionality or lower cost technologies; and
- have exploited arbitrage opportunities brought about by regulation; for example, the requirement for BT to charge geographically-averaged prices, or restrictions on BT's ability to rebalance between calls and line rental.

1.12 Each of these sources of competitive advantage is in decline. BT is becoming more efficient and enjoys greater scale economies than its competitors, competition has eroded margins and BT is now proposing to invest in a state-of-the-art new core network.

1.13 This decline is taking place as the industry is undergoing a significant transition from voice and other narrowband services delivered via the Public Switched Telephone Network (PSTN), to broadband services delivered over new IP networks. The margins generated by these new services seem to be significantly lower than those generated historically by more established services. This transition has major consequences for all market participants including BT; but for BT's competitors, it is bringing into sharp relief the unsustainability of the current situation.

1.14 The status quo is one in which alternative operators to BT are struggling to compete with BT in fixed markets. The Altnet sector has yet to consolidate as many have predicted. The financial challenges faced by many alternative network operators have increased as the equity, debt and bond markets have adjusted their view of the potential of those businesses. Yet just at the time when investment funds are badly needed – by Altnets to invest in new networks to remain competitive with BT, and by the nation itself to remain competitive with other countries – those funds may not be available.

Delivering better outcomes requires a new regulatory approach

1.15 Regulation does not and should not control all the levers necessary for a step change in the fortunes of the sector. For instance, Ofcom can aim for a regulatory regime which rewards operations which have economies of scale, but we cannot determine investment or consolidation in the sector. We can, however, provide a clear framework which addresses the enduring problems of the regulatory regime to date.

1.16 In the early and mid 1990s, regulation aimed principally to promote infrastructure competition, particularly in access. As we noted in Phase 1, this policy was successful in attracting very high levels of investment in telecommunications: £11bn in 2000 for example, more than 10 per cent of total UK capital expenditure. In the mobile sector, this approach proved to be very successful. Yet despite enormous investment in core networks and in cable and metropolitan access networks, the level of fixed infrastructure competition today is more limited than the architects of the original policy a decade ago would have imagined.

1.17 Enduring economic bottlenecks in fixed telecoms networks remain. By this we mean not just parts of the network where BT has significant market power (SMP), but those areas where effective, infrastructure-based competition is unlikely to emerge in the medium term. This may be due to the fundamental economics of building competing infrastructure, or in some cases due to market factors such as barriers to customers switching suppliers.

1.18 From the late 1990s, partly as a result of the adoption of the European framework, telecoms regulation aimed more equally to promote service-based and infrastructure-based competition. But both types of competition proved slow to take root. Infrastructure-based operators continued to struggle to achieve scale, while service providers were frustrated by delays and inadequacies in wholesale access products.

1.19 We believe that UK telecoms regulation has yet to overcome the problems of enduring economic bottlenecks combined with lack of equality of access to these parts of the network. The problem of enduring economic bottlenecks is that the economies of scale and sunk costs of telecoms networks, especially for fixed access networks, are particularly hard for new entrants to overcome. Yet if new entrants do not build their own fixed access or backhaul networks, they are reliant instead on BT to provide wholesale access to its network. They then face the problem of inequality of access. Those who rely on BT to provide such access have experienced twenty years of:

- slow product development;
- inferior quality wholesale products;
- poor transactional processes; and
- a general lack of transparency.

1.20 While individually each issue might seem immaterial, cumulatively they make the reality of competing against a vertically-integrated player an economically unattractive proposition.

1.21 In an attempt to address this, increasingly detailed regulation has been introduced. This has created a regulatory mesh which places a series of obligations on BT at the retail and wholesale levels. While all individually justifiable, the combination of obligations creates additional costs and often conflicting incentives. This is particularly so when competition is promoted at multiple layers of the value chain, using a variety of overlapping regulatory instruments.

1.22 This outcome is not optimal for citizens and consumers, for BT's competitors nor for BT itself. It is restrictive and costly to all parties, and at this stage of network and technology development it is potentially damaging to our long-term competitiveness as a nation. This will become an even more critical issue with the deployment of next generation technologies, where current rules of interconnection and many of the related wholesale products will no longer apply.

1.23 For all of these reasons a continuation of the status quo is neither acceptable nor desirable.

Key regulatory principles

1.24 We believe that a fresh and coherent approach, based upon clear principles, is imperative. Our principal duty under the Communications Act requires that we further the interests of citizens in relation to communications matters, and further the interests of consumers in relevant markets, where appropriate by promoting competition. In addition, we are required to have regard to the principle that regulatory activities should be transparent, accountable, proportionate, consistent and targeted only at cases where action is needed. Taken together, we think it is important to explain how we intend to determine where it is appropriate to promote competition, and what form that promotion of competition should take.

1.25 The principles we propose to guide our actions are:

1. promote competition at the deepest levels of infrastructure where it will be effective and sustainable;
2. focus regulation to deliver equality of access beyond those levels;
3. as soon as competitive conditions allow, withdraw from regulation at other levels;
4. promote a favourable climate for efficient and timely investment and stimulate innovation, in particular by ensuring a consistent and transparent regulatory approach;
5. accommodate varying regulatory solutions for different products and, where appropriate, different geographies;
6. create scope for market entry that could, over time, remove economic bottlenecks; and
7. in the wider communications value chain, unless there are enduring economic bottlenecks, adopt light-touch economic regulation based on competition law and the promotion of interoperability.

1.26 In seeking to meet these principles, Ofcom has identified three options. Option 1 would involve across-the-board deregulation and reliance solely on competition law to police the market. Under Option 2, we would commence a factual and detailed investigation under section 131 of the Enterprise Act to assess whether any feature or combination of features of the market prevented, restricted or distorted competition in a way which requires remedies going beyond Ofcom's powers under the Communications Act or the Competition Act. Option 3 would focus regulation on enduring economic bottlenecks, and tackle the problem of inequality of access head-on.

Option 1: Deregulation

1.27 We stated in Phase 1 that the first consideration for the Review would be 'why regulate at all'? We have considered whether there is a case for the immediate, across-the-board withdrawal of sector-specific regulation in some or all of the market.

1.28 Coherent arguments can be made in favour of such an approach. First, regulation is not a cost-free or risk-free activity. It imposes significant direct and indirect costs on the industry and consumers. There are significant practical problems associated with the effective execution of regulation, for example information asymmetries, where regulated companies enjoy superior knowledge of their businesses than the regulator. There is a danger that the law of unintended consequences can apply to well-meaning regulatory initiatives. But while this implies that caution needs to be exercised in applying regulation, it does not of itself demonstrate that citizens and consumers would be better off without any regulation.

1.29 Second, it can be argued that regulation could actually prevent competition emerging rather than promote it. In particular, actions by regulators to force down the high prices of a regulated company may have the consequence of deterring other companies from entering the market. The weight of this argument depends on the realistic scope for further entry into different parts of the market. In markets characterised by high levels of innovation and low barriers to entry, we believe that there should be a strong presumption against regulatory interference. However, in fixed telecommunications there is a core set of enduring economic bottlenecks with little immediate prospect of their being removed by further market entry or innovation.

1.30 Nonetheless, it could be argued that even if there were such enduring sources of market power, Ofcom should withdraw from sector-specific regulation and rely on the Competition Act alone. The arguments against such an approach are that competition law may not allow for the precision or speed of intervention that is necessary to give all parties – including companies who have market power – the confidence to plan their businesses and undertake investments. Experience in other countries suggests a risk of key decisions becoming embroiled in lengthy and complex litigation. In addition, competition law is not the best tool for addressing excessive prices, and is hard to use when remedies require ongoing monitoring, such as compliance with the detailed technical requirements involved in local loop unbundling.

1.31 While the option of an across-the-board withdrawal of regulation is attractive, we believe there are significant practical problems with pursuing an approach of this kind. Such an approach may be constrained by the current European framework; we believe it would also be difficult to reconcile with our functions and duties. We welcome responses to this view.

Option 2: Reference under the Enterprise Act

1.32 Many commentators, and indeed some respondents to our Phase 1 consultation, have claimed that the regulatory problems of the telecommunications sector are so fundamental that they cannot be

addressed using our existing powers. They argue that the problems stem from the underlying market structure. Section 131 of the Enterprise Act 2002 includes powers for regulators to make referrals to the Competition Commission of markets where there are reasonable grounds for suspecting:

"….that any feature, or combination of features of a market in the UK for goods or services prevents, restricts or distorts competition in connection with the supply or acquisition of any goods or services in the UK or part of the UK."

1.33 Such an investigation would be wide-ranging. The Competition Commission would be able to impose structural remedies. It could, for instance, examine whether the only solution to the problem of inequality of access would be the separation of BT's wholesale network operations and its retail service provision. In our view structural separation of the network infrastructure would be a complex and difficult task, nor would it eliminate the need for regulation. It would represent a seismic change to the UK industry structure, but it may unlock value and improve customer service, innovation and competition in the mid to long term.

1.34 The majority of respondents indicated in our Phase 1 consultation that they would prefer a solution to the problem of inequality of access based on a combination of equivalence at the product level, and behavioural change by BT. We share that view. However, should this approach not deliver real equality of access, a reference under the Enterprise Act, which would no doubt lead to the issue of structural separation being actively considered, might be the only viable option.

Option 3: Real equality of access

1.35 Central to the application of our proposed principles is the need to tackle the problem of inequality of access head-on. We believe that this can be achieved without the disruption and costs associated with a move towards the structural separation of BT. Delivery of equality of access in this way has two components: equivalence at the product level, and clear behavioural changes by BT.

1.36 At the product level, equality of access implies that BT's wholesale customers should have access to:

- the same or a similar set of regulated wholesale products as BT's own retail activities;
- at the same prices as BT's own retail activities; and
- using the same or similar transactional processes as BT's own retail activities.

1.37 This is our definition of what is often called *equivalence*. There are different models of equivalence. For all *new* regulated wholesale products and some key existing ones, we believe that a strong model is needed in which BT is required to offer exactly the same wholesale products to its wholesale customers as to its own retail activities. For *existing* products, we propose to assess each case on its merits. It may be that for some products, the costs of product and process redesign required by this type of equivalence would

not be merited given their limited lifespan. In these cases, BT should be required to offer similar but not identical products and processes.

1.38 In addition to changes at the product level, substantial behavioural changes by BT are also fundamental to solving the problem of inequality of access. We recognise that BT currently applies significant resources to regulatory compliance; for example, to date it has put over 50,000 employees through a compliance course. Yet continued complaints from BT's wholesale customers raise concerns that some types of behaviour by BT – such as inappropriate information sharing, inferior processes, and lack of priority for wholesale customers' product development – are both unfair and commonplace. The way that BT conducts its internal business creates both the incentive and the means for unfair treatment of this nature. Even where individual allegations are not proven, it is clear from the views of BT's wholesale customers that the current systems do not deliver the transparency and confidence that BT's customers require. Achieving equality of access would require:

- a significant shift in BT's behaviour at an organisational level in support of equivalence at the product level;
- changes in management structures, incentives and business processes, which today remain as a consequence of BT's historic structure as a vertically-integrated operator;
- information flows within BT which mirror the information flows between BT and its wholesale customers, so that its customers are able to influence BT to the same extent that different parts of BT can influence each other; and
- that this level of equivalence within the organisation can be demonstrated through transparency.

1.39 We look to the management of BT to provide prompt and clear proposals which will achieve such a change.

1.40 Past experience in other sectors shows that regulation designed to remove the scope for discrimination may sometimes lead to voluntary structural separation because the costs of compliance are so great, and many benefits of vertical integration are effectively removed. While any future decision on structure is, of course, a matter for BT and its shareholders, we believe our proposals to apply equality of access should not impose disproportionate costs on BT. We therefore do not consider that delivering equality of access would lead inevitably to the separation of BT.

1.41 This option would constitute a significant change in approach. It could unlock a package of other measures which would move the market towards more flexible and less intrusive regulation. At the moment there is regulation in many retail markets, as well as a complex mesh of regulation at different wholesale levels, illustrated in Figure 1.

Figure 1: Summary of major markets where BT is subject to market-specific interventions due to its significant market power (SMP)

Retail markets
Residential analogue exchange line services
Residential ISDN2 exchange line services
Business analogue exchange line services
Business ISDN2 exchange line services
Business ISDN30 exchange line services
Residential local calls
Residential national calls
Residential calls to mobiles
Residential operator assisted calls
Residential IDD category A calls
Residential IDD category B calls (route-by-route)
Business local calls
Business national calls
Business calls to mobiles
Business operator assisted calls
Retail low bandwidth leased lines

Wholesale markets
Call origination
Local tandem conveyance and transit
Inter-tandem conveyance and transit
Single transit
Termination
Exchange line services
Wholesale IDD
Local access
Asymmetric broadband origination
Asymmetric broadband conveyance
Traditional interface leased line origination <8 Mbit/s
Traditional interface leased line origination 8-155 Mbit/s
Alternative interface leased line origination
Leased Lines - trunk segments

1.42 We are proposing to introduce more effective regulation, focused on enduring economic bottlenecks. Then, when BT has delivered equality of access in these areas, we are proposing to withdraw many additional layers of regulation from wholesale and retail markets. Regulation of many retail markets may become unnecessary because effective wholesale regulation will enable them to become competitive. The regulated wholesale network access products which ultimately will be required will be significantly fewer in number (the principal ones are listed in Figure 2 below), because they will be focused on enduring economic bottlenecks.

Figure 2: Principal future regulatory interventions in fixed telecoms markets

Local loop unbundling
DataStream
Wholesale leased lines (traditional interface); e.g. partial private circuits
Wholesale leased lines (alternative interface); e.g. wholesale LAN extension service, backhaul extension service
Wholesale line rental
Carrier pre-selection
Interconnection (including interconnection circuits) and call termination
Migration products

1.43 We believe there is a case for what would in effect be a new *regulatory contract* with BT; this is not a real contract but a settlement between Ofcom and the industry. Effective competition is in prospect in many parts of the core network. If BT delivers equality of access, and if the access and interconnection arrangements for its proposed 21st Century Network do not limit competition, there would be strong prospects for competition in these parts of the network. This would imply that regulation controlling the wholesale price of interconnection to BT's core network, for example Network Charge Controls, could increasingly be relaxed; competition could be expected to achieve a similar objective. Conversely, there is much less prospect of effective competition to BT's access network. Therefore for this part of the network, regulation of the returns that BT is permitted to make on its assets is the principal means of consumer protection. Ofcom is reviewing this area and will shortly publish a separate consultation on the valuation of BT's copper local loop which will consider the merits of the different methodologies for future regulatory calculations.

1.44 Option 3 – real equality of access – is our preferred option, provided that BT can deliver the necessary changes. We believe it offers the prospect of fair competition alongside a substantial reduction in the current complex mesh of regulation. We have therefore set out in some detail the implications of this option for consumer protection and for economic regulation in a number of key markets.

Increased importance of consumer protection

1.45 Withdrawal of regulation at the retail level would imply that consumers would increasingly be protected by competition, not directly by regulation. Therefore it is critical that competition is effective in delivering the outcomes which consumers require, and that there is an enduring safety net of protection for vulnerable consumers.

1.46 For competition to be effective in delivering these outcomes, it is essential that consumers have access to clear and reliable information which enables them to make informed choices between suppliers. Should they wish to switch supplier, it must be straightforward for them to do so. Our consumer research indicates that for some consumers, and for some telecoms products, this is not currently the case. We are proposing a number of

options for improving consumers' awareness of alternative suppliers and their means of choosing between them. They are:

- **Leave provision of information to the market**. However, we are sceptical that the market, left entirely to its own devices, will provide enough information for consumers in a sufficiently comparable format;
- **Ofcom to provide comparable pricing information**. Although consistent with the practices of other sector regulators, this would be resource-intensive for Ofcom and might be offered more creatively and at lower cost by third parties;
- **Promote provision of basic information and the role of intermediaries**. This would include initiatives such as an extension of Ofcom's current PASS scheme (a scheme for accrediting third party comparison internet sites). It would be important to ensure that operators co-operated with these initiatives;
- **Encourage a responsible approach to service comparisons in advertising**. This would involve working closely with the Advertising Standards Authority (ASA);
- **Restrict the range of tariff packages and structures in the market**. Though this could in principle simplify consumers' choices, the costs in terms of stifled innovation would be likely to be very considerable; and
- **Bill formats**. Service providers may be able to make changes to make their bills easier to understand and to facilitate comparisons; for example through greater use of plain English.

1.47 In addition, we are consulting on a number of options for simplifying the process of switching supplier. These include:

- **Regulating retail switching costs**. Ofcom could continue Oftel's approach of ensuring that excessive charges for switching processes do not deter customers from switching supplier;
- **Positively encouraging switching**. Ofcom could advise customers to shop around and switch in order to benefit from competition;
- **Encouraging migration between tariff plans**. For example, Ofcom could encourage or even require operators proactively to inform their customers of cheaper tariffs that they offered; and
- **Encouraging providers to reduce the complexity of switching processes**, to ease the complexity that consumers sometimes face when changing suppliers.

1.48 We are actively seeking advice on the options we have proposed from a range of bodies, and in particular from Ofcom's independent Consumer Panel.

1.49 Universal service regulation provides the safety net for vulnerable consumers. We believe that the mechanisms for funding and provision of universal service may need to change as the telecoms market evolves. The current mechanism, where Kingston and BT both fund and provide universal services, may at some point constitute an unfair burden on these

operators. At that point, it would be necessary to design new funding and provision mechanisms, for example involving some kind of universal service fund. In future, it may also be appropriate to look at the scope of today's universal services. Although we do not believe that there is a case for extending universal services to include broadband at this point, we do intend to consider how the scope of universal service regulation should evolve over time.

Proposals for key markets

1.50 Our proposed principles have implications for how regulation needs to be applied in a number of key markets. We have looked in particular at current generation broadband, voice, next generation core networks, next generation access networks, and mobile.

1.51 We believe that **current generation broadband** (by which we mean services delivered over today's broadband networks) is the bridge between the telecommunications environment of the past and that of the future.

1.52 This market is now growing rapidly; there were 5.3 million broadband subscribers in the UK in September 2004, representing over one third of all internet households. In future we believe that broadband will be key to effective competition in voice services, because as Voice over Internet Protocol (VoIP) enters the mass market, the access products put in place for data services will be used also to provide voice. In addition, effective competition in next generation broadband services is contingent on there being strong competitors earning returns from today's broadband services.

1.53 In current generation broadband we believe there to be a number of promising alternative access infrastructures that could compete with DSL and cable. However, their roll-outs may be restricted to certain locations, and their business plans are insufficiently proven at this point for us to base our regulatory strategy, even in part, upon their roll-out. For this reason, we propose to continue the strategy set out in the statements that we made earlier this year on broadband policy, of promoting competition in DSL at the deepest level of infrastructure where competition will be effective and sustainable. In higher customer densities this will be based on access to the local loop through local loop unbundling (LLU); in other areas it may be that competition will be based on access to backhaul or core networks.

1.54 The actions taken earlier in the year by Ofcom, the Independent Telecommunications Adjudicator and BT have already had a significant impact on plans for LLU, and operators including NTL and Cable & Wireless have announced plans to invest. However, further steps may be necessary to ensure that LLU is ultimately as successful as we believe it can be and to achieve the target of operational capability for a million unbundled lines per year.

1.55 In **voice**, we believe that technological change may offer the prospect of more competition through the emergence of converged voice and data services, and potentially greater competition between fixed and mobile platforms. In June 2004, and taking the fixed and mobile voice markets as a whole, BT had a 38 per cent share of total voice call volumes, and other fixed operators and mobile operators each had a 31 per cent share. These

trends may reduce the need first for PSTN-specific regulation, and ultimately for voice-specific regulation.

1.56 We are proposing a staged withdrawal from such regulation, with each stage contingent on particular competitive outcomes being met by the market, tested by objective criteria.

- **Stage 1** (ongoing) is the development of a fit-for-purpose Wholesale Line Rental (WLR) product, reflecting the bottleneck asset of local access lines. Before we can commence deregulation, the basic building blocks necessary for competition in today's voice market need to be in place;
- **Stage 2** (2005) will commence once WLR has been introduced and is proven to be effective. It will then be possible to review the withdrawal from much regulation of fixed retail voice markets;
- **Stage 3** (2005), which will take place in parallel to Stage 2, will review the withdrawal of regulation in certain wholesale markets, such as wholesale international direct dial markets, where competition is increasing;
- **Stage 4** (2008-2010) will review the evolution of remaining fixed wholesale voice markets. As BT's new 21st Century Network evolves, regulation will need to evolve in response. There is an opportunity for access products designed for data, such as LLU and DataStream, to provide the mechanism for wholesale competition in voice; and
- **Stage 5** (on-going monitoring, review by 2008) we will assess whether there is a case for the definition of an inter-platform voice market, which includes both fixed and mobile. We do not believe that the conditions are yet close to being met for this to be defined today, but as 3G networks are rolled out and consumers' behaviour continues to evolve, it may be appropriate to do so in the future. Effective competition could emerge as a result at both the retail and wholesale levels. If this does occur, it offers the prospect of the end of regulation in voice-specific services, save for continuing universal service provisions.

1.57 The transition to **next generation core networks** based on packet-switched technology implies a need for regulation also to evolve. This is a once-in-a-generation opportunity to ensure that the fundamental network and regulatory structures are aligned to ensure opportunities for fair competition in future. We will shortly be issuing a consultation on the key policy issues involved in the access and interconnection arrangements for BT's proposed 21st Century Network, to ensure that these arrangements adhere to our proposed regulatory principles.

1.58 We believe that development of **next generation access networks** also offers the opportunity to find a way to avoid the regulatory battles of the last twenty years. These are networks which go beyond the capabilities of the copper, co-axial cable and wireless public networks that exist today, allowing much higher bandwidth services to be delivered to customers. There is enormous interest among many stakeholders in the potential timescale and scope of deployment in the UK of such networks, which could have powerful economic and social effects.

1.59 The market already provides services to larger business users using next generation access networks. But the prize for both industry and nation would be to see the mass-market deployment of such networks to residential consumers and small to medium sized enterprises (SMEs). Because these networks are not yet in place in any scale, it is very important that regulation does not disincentivise their timely and efficient deployment. In principle, the simplest way to achieve this would be to forbear from any regulation of such new networks for a defined period of time. But such forbearance would not be appropriate if only BT, in practice, was in a position to make such an investment. Therefore one possible approach would be to make such time-limited forbearance contingent on the investment opportunity being contestable by other operators. But the means of achieving contestability – opening access to BT's ducts and external plant – is likely to be fraught with practical difficulty.

1.60 If for these reasons forbearance was inappropriate, an alternative option would be to apply the principles of equality of access to BT's future next generation access infrastructure. But even were BT's allowable rate of return adjusted for the risk involved in rolling this out, such a policy might disincentivise timely investment. A final option would be to plan now for the ring-fencing of a separate entity to provide next generation access, based upon the shared access model pioneered in some other businesses. We invite responses to each of these approaches.

1.61 The UK's **mobile** market is much more competitive than fixed markets, and therefore subject to less regulation. However, economic regulation remains in call termination, and in this area it is complex and intrusive. We would like to explore any proposals the industry may have for alternative arrangements, whether these be different structures for call termination, or market-based solutions possible under next generation mobile networks.

A critical consultation

1.62 If our proposed regulatory approach is implemented successfully, the prize for UK consumers would be both substantial and attainable. This approach offers the prospect of more choice, faster innovation, and vigorous competition in price, service levels and other product features. For citizens, we believe it can deliver a telecoms infrastructure to allow the UK economy the best opportunity to compete with its global competitors.

1.63 We believe that there is a valuable prize for industry too; one through which the delivery of fair competition creates the opportunity for deregulation. We have proposed a regulatory strategy where the fulfilment of specific conditions would allow deregulation to take place. The delivery of real equality of access at the wholesale level will trigger deregulation at the retail level. The development of competitors of scale in fixed telecoms offers the longer term prospect of deregulation at the wholesale level too.

1.64 Our proposals are fundamental to the future of the UK's telecoms sector and we very much hope you will give us your views, by responding to this consultation or by participating in any of the workshops and events that we will be organising through the consultation period.

2. Responding to this consultation document

This consultation

2.1 This document is the Phase 2 consultation document in Ofcom's Strategic Review of Telecoms. It seeks views on the future prospects for the UK telecoms sector. In preparing this document, Ofcom has taken into account inputs from telecoms operators and service providers, financial institutions, consumer organisations and others.

2.2 This consultation document is addressed to all organisations and individuals who have an interest in the telecoms industry in the UK. This includes, among others:

- businesses participating in the telecoms sector, including infrastructure-based operators and service providers, and manufacturers of telecoms equipment;
- others with a commercial or employment interest in the sector, such as trades unions;
- consumers of telecoms services, either as businesses or as individuals, and organisations representing consumers;
- individuals or organisations concerned with the impact of telecoms on particular groups of citizens, or on the economy as a whole; and
- Government departments.

2.3 Shortly into the consultation period, we will be publishing a summary document directed at smaller organisations or individuals who do not have time to read this full document. The summary version will have a Crystal Mark for clarity from the Plain English Campaign.

2.4 Electronic copies of this document are available on Ofcom's website: www.ofcom.org.uk.

How to respond

2.5 Ofcom invites written views and comments on the issues raised in this document, to be submitted by 5pm on 3 February 2005.

2.6 Ofcom strongly prefers to receive responses as email attachments, in Microsoft Word format, as this helps us to process the responses quickly and efficiently. We would also be grateful if you could assist us by completing a response cover sheet (attached as Annex C), among other things to indicate whether or not there are confidentiality issues. The cover sheet can be downloaded from the 'Consultations' section of our website.

2.7 Please send your response to: dougal.scott@ofcom.org.uk, marked 'Strategic Review of Telecoms – consultation response'.

2.8 Responses can alternatively be posted or faxed to the address below.

Dougal Scott
Ofcom
Riverside House
2a Southwark Bridge Road
London SE1 9HA

Email: dougal.scott@ofcom.org.uk
Fax: 020 7981 3333

2.9 Please note that we do not need a hard copy in addition to an electronic version. We do not routinely acknowledge receipt of responses.

2.10 It would be helpful if your response could include direct answers to the questions asked in this document. These questions are listed together in Annex B. Ofcom would also be interested to receive comments on any other aspects of issues raised in this document. It would be helpful if you outline why you hold your views, and how Ofcom's proposals would impact on you.

Further information

2.11 If you have any questions about the issues raised in this consultation, or need advice on the appropriate form of response, please contact Dougal Scott on 020 7783 4305. This consultation is being led by Alex Blowers, Head of Policy Development at Ofcom, who is project director of the Telecoms Review. The Telecoms Review is the overall responsibility of Ed Richards, Senior Partner at Ofcom, who can also be contacted in relation to the issues raised in this consultation document.

2.12 Please note that you can register to receive automatic notifications of when Ofcom documents are published, at http://www.ofcom.org.uk

Confidentiality

2.13 Ofcom thinks it is important for everyone interested in an issue to see the views expressed by consultation respondents. We will therefore usually publish all responses on our website, www.ofcom.org.uk. We will do this on receipt of responses, unless respondents request otherwise on their response cover sheet.

2.14 All comments will be treated as non-confidential unless respondents specify that part or all of the response is confidential and should not be disclosed. Please place any confidential parts of a response in a separate annex, so that non-confidential parts may be published along with the respondent's identity.

2.15 Ofcom reserves its power to disclose any information it receives where this is required to carry out its functions. Ofcom will exercise due regard to the confidentiality of information supplied.

2.16 Please also note that copyright and all other intellectual property in responses will be assumed to be licensed to Ofcom to use, in order to meet

all its legal requirements. Ofcom's approach on intellectual property rights is explained further on its website, at www.ofcom.org.uk/about_ofcom/gov_accountability/disclaimer.

Ofcom's consultation processes

2.17 Ofcom is keen to make responding to consultations easy, and has published some consultation principles (listed in Annex A) which it seeks to follow, including on the length of consultations.

2.18 If you have any comments or suggestions on how Ofcom conducts its consultations, please call our consultation helpdesk on 020 7981 3003 or email us at consult@ofcom.org.uk. We would particularly welcome thoughts on how Ofcom could more effectively seek the views of those groups or individuals, such as small businesses or particular types of residential consumers, whose views are less likely to be obtained in a formal consultation.

2.19 If you would like to discuss these issues, or Ofcom's consultation processes more generally, you can alternatively contact Philip Rutnam, Partner, Competition and Strategic Resources, who is Ofcom's consultation champion:

Philip Rutnam
Partner, Competition and Strategic Resources
Ofcom
Riverside House
2a Southwark Bridge Road
London SE1 9HA

Email: philip.rutnam@ofcom.org.uk
Telephone: 020 7981 3585

3. Introduction

3.1 On 12 December 2003, Ofcom announced that it would be consulting throughout 2004 on a Strategic Review of Telecommunications ('the Telecoms Review').

3.2 The Review is intended to assess the options for enhancing value and choice in the UK telecoms sector. It has a particular focus on assessing the prospects for maintaining and developing effective competition in UK telecoms markets, while also considering investment and innovation. This assessment will in turn shape the strategy through which Ofcom will promote competition or take other regulatory action to further the interests of consumers and citizens in the UK. The full rationale for the Review is outlined in the Terms of Reference for the Review, which we have reproduced in Annex D.

3.3 The Review is in three phases:

- Phase 1: the current position and prospects for the telecoms sector;
- Phase 2: the options for Ofcom's strategic approach to telecoms regulation; and
- Phase 3: Ofcom's approach to telecoms regulation.

3.4 Phase 1 is now complete. This Phase 2 document sets out some specific options for future regulatory action. The final output of the Review will be a statement from Ofcom which will set out a new strategy for telecoms regulation. We anticipate publishing this statement in spring 2005.

The Phase 1 consultation

3.5 Ofcom published its Phase 1 consultation document in April 2004, to elicit views on the current position and prospects for the sector. Our aim was, by gaining an accurate and forward-looking view of the development of the sector, to be able to then design the most appropriate regulatory framework from now to the end of the decade and beyond.

3.6 We received over 100 responses from a very wide range of stakeholders. These responses were supplemented by a large number of face-to-face meetings with key stakeholders and a series of seminars, lunches and regional roadshow events. We are grateful for the effort put in by all the respondents. In general, stakeholders genuinely engaged with important medium term issues rather than merely rehearsing current concerns or grievances. Much of the discussion of future prospects for the sector was necessarily speculative. Having said this, a number of key themes were strongly evident in many responses, and are firmly reflected in the proposals in this document.

3.7 In the Phase 1 consultation, we set out five key questions which were fundamental to the outcome of the Review. The responses are summarised below. A fuller summary of responses is provided in Annex N.

Question 1: In relation to the interests of citizen-consumers, what are the key attributes of a well-functioning telecoms market?

3.8 Several key themes emerged in answers to this question, and we explore the attributes of a well-functioning telecoms market in more detail in Chapter 4.

3.9 There was a strong recognition that telecoms has moved beyond the monopoly utility characteristics which dictated the form of regulation in the period after BT was initially privatised. For the majority of consumers, issues around the availability of innovative new products such as broadband are at least as important now as the issue of call prices. This confirms Ofcom's sense that, while competitive pricing will remain a key measure of success, rapid provision of new services is increasingly important. There is an equally strong interest in the benefits of product innovation, particularly among business users but also among residential consumers who now expect much greater functionality and flexibility from the products they purchase.

3.10 Ofcom was urged to consider the traditional concept of telecoms – the physical network business – as part of a much wider value chain that incorporates the internet, content businesses, IT apparatus and consumer devices. Increasingly, there is competition between companies at different places in this value chain: for instance, telecoms network operators competing for large business contracts may find themselves challenged by systems integration businesses such as EDS and IBM.

3.11 The importance of consumers being able to make informed choices was highlighted by many, including Ofcom's Consumer Panel. Consumers of telecoms services face increasingly complex decisions as services and pricing schemes become increasingly complex. It was suggested that Ofcom would need to do more to ensure that clear, transparent consumer information is available to consumers to enable them to make informed choices.

3.12 Businesses were concerned that their particular interests should be fully reflected in the debate. For businesses, availability of high-quality, keenly priced data services from a range of suppliers was seen as a critical issue.

3.13 Many respondents felt that Ofcom's duties to citizens could be interpreted as a duty to act to promote UK competitiveness. The availability of broadband – and as soon as possible higher speed broadband services – was seen as key to this.

3.14 Finally, it was pointed out that while many would benefit from the new, innovative environment, there was a high probability that these benefits would be shared unevenly between different groups in society. In the future, as now, there would be a need to take concerted action to address the needs of vulnerable groups including those with special needs and the socially excluded, and to ensure that citizens in different parts of the country were not left behind. This confirmed Ofcom's view that setting a strategic framework for the consideration of changes to universal service obligations should be an important component of the Review.

Question 2: Where can effective and sustainable competition be achieved in the UK telecoms market?

3.15 The majority of respondents felt that local access for fixed services would continue to be a bottleneck. BT itself recognised that local access was likely to be a bottleneck for some time to come in many geographic areas. A number of respondents commented that cable networks were unlikely to expand their existing cable TV infrastructure (though the cable companies themselves did not rule this out). While many pointed out promising developments in relation to new wireless services, notably the launch of trial services by UK Broadband, many felt it to be too early to judge the potential of these technologies.

3.16 In contrast, most considered that there was scope for competition in core networks and in some areas in backhaul services (the connections which link core networks to access networks). It was also considered that, while it was unlikely that entirely new local access networks would be constructed, access-based competition based on Local Loop Unbundling was viable, provided that LLU was made available on reasonable terms.

3.17 A minority of respondents considered that all fixed network infrastructure was a natural monopoly, and that the only place where competition was feasible was in service provision over a common infrastructure. At the other end of the spectrum, the view was expressed to Ofcom during the Review that in the long run technological change would erode all natural monopolies including access. According to this perspective, Ofcom's aim should be to facilitate the emergence of such competition, principally by forbearing from regulating existing monopolies, as the resultant monopoly profits would provide the spur to further competitive entry.

Question 3: Is there scope for a significant reduction in regulation, or is the market power of incumbents too entrenched?

3.18 The majority of respondents considered that there would be continued need for regulation of BT's local access network for the foreseeable future. BT also accepted this in its response.

3.19 However, some respondents did raise the prospect of significant reduction in regulation in certain areas. A significant number of respondents considered that the voice market could become effectively competitive through a combination of fixed-mobile substitution and new entry from VoIP providers. Views varied on how quickly this could come about. Some argued that such substitution was some way away, or that mobile companies would be unlikely to reduce their mobile telephony prices, and that VoIP would have a more marginal impact in the UK than in other countries.

3.20 There was widespread acceptance that the current regulatory landscape is unnecessarily complicated and it ought to be possible to reduce the number and complexity of regulatory instruments. Some respondents linked this to their answer to question 5 – if a guarantee of non-discrimination by BT could be built into provision of wholesale services, there would be scope for considerable reduction in regulation in retail markets.

3.21 Finally, the mobile companies argued strongly for the removal of some remaining regulations on their businesses, arguing that the mobile market is effectively competitive. They pointed out how many regulators their activities now caused them to have to deal with, including ICSTIS, DTI, the FSA, and the Office of the Information Commissioner. Conversely, a number of responses, particularly from service providers, argued that mobile companies held considerable market power and should if anything be more tightly regulated.

Question 4: How can Ofcom incentivise efficient and timely investment in next generation networks?

3.22 On this question, opinion divided sharply between respondents who considered it somewhat presumptuous of Ofcom to see its role as 'incentivising' investment (a role best left to the market), and those who considered this to be the single most important issues for consideration in the Review.

3.23 On the rate of adoption of next generation networks, responses distinguished between next generation core networks based on IP standards (like BT's 21st Century Network), and next generation access networks (such as fibre-to-the-home). Investment in the former is already taking place. Many considered that network operators will have strong cost-reduction incentives to deploy such networks. The challenge for the regulator was considered to be to ensure an appropriate access and interconnection framework, encompassing new IP network to IP network interconnection, interconnection of IP networks with legacy PSTN networks, and interoperability of networks, services and content.

3.24 For next generation access networks, the situation was much less clear. Many network operators argued that the case for new investments in access was weak: nearly all the services for which strong demand could already be discerned could be offered over existing access networks (albeit with some incremental investment needed).

3.25 On the other hand, many other stakeholders including equipment manufacturers, content providers, and public interest and consumer groups, believed that there would be powerful benefits from the deployment of next generation broadband networks. These benefits would accrue to the economy as a whole, through development of new services, increased productivity and competitiveness, and to society, through the creation of new social networks and greater access to information and public services. There was felt to be a gap between the private interests of network operators (who for a variety of reasons may not currently wish to make these investments) and the public interest.

Question 5: At varying times since 1984, the case has been made for structural or operational separation of BT, or the delivery of full functional equivalence. Are these still relevant questions?

3.26 Overwhelmingly respondents agreed that these issues should be considered as part of the Review. A strong theme of many responses was that the regulatory regime had failed to deliver on the early promises of full

competition and consequent regulatory withdrawal. Many respondents argued that BT's market power in the fixed market was entrenched, and regulation had proven ineffective in remedying this problem. It was argued that BT's vertically-integrated structure gave it considerable scope to discriminate in favour of its own downstream businesses. Some commentators also considered that regulation had encouraged unsustainable business models on the part of many new entrants, and that this was now being reflected in the increased investor scepticism being encountered by many companies.

3.27 A minority of respondents, including many smaller service providers, argued that in the face of this problem structural separation of BT was appropriate. They felt that such a one-off intervention was justified because it would deliver substantial benefits in terms of creating more vigorous downstream competition, and a lesser need for on-going regulatory intervention.

3.28 However, the majority of respondents did not consider the structural separation of BT to be appropriate at this time. Some argued that it was simply the wrong solution for current market circumstances or would be beset by insuperable practical difficulties in its implementation. Others considered that the benefits of restructuring could be achieved through the introduction of equality of access for third parties buying inputs from BT in competition with downstream BT businesses. This would incorporate so-called equivalence at the product level and (in the view of some respondents) changes to BT's internal operational structure so as to promote behavioural change by BT. But within this group, many argued that structural separation would be appropriate as a last resort if attempts to achieve equality of access failed.

3.29 BT was strongly of the view that structural separation would be an inappropriate and highly damaging intervention. But it agreed that there was scope for greater equivalence in the relationship between BT Wholesale and BT Retail on the one hand, and BT Wholesale and rival downstream businesses on the other.

3.30 It was clear, however, that there were significant differences of interpretation as to what equivalence requirements would be necessary to deliver effective competition.

The Phase 2 consultation

3.31 In preparing this Phase 2 document, we have carried out analysis in a number of areas. For example, we have carried out a large-scale programme of consumer research, we have researched other markets and other sectors, and we have commissioned academic work in specific areas including consumer choice, equivalence, call termination and effective competition.

3.32 In this document, we build on the outcome of the Phase 1 consultation and the various workstreams conducted by Ofcom to date, and set out three options for the future regulation of the sector. These options build on the main themes which emerged in response to the five key questions.

3.33 In **Chapter 4**, we discuss the evolution of the telecoms sector to date, and the prospects for its future evolution. We discuss the drivers for change in telecoms, and why we believe we are at a critical point in the sector's evolution. We discuss how it is necessary increasingly to understand the wider telecoms value chain, of which networks are just a part. Our consumer research reveals that what citizens and consumers want from a well-functioning telecoms market has changed over time; we discuss what a successful approach would deliver in future, and what the prize will be if we are successful. We discuss how the aims and methods of telecoms regulation have altered over time, and identify what we believe to be the enduring problems encountered by telecoms regulation. Finally, we look at what two decades of telecoms regulation have delivered, and recap our Phase 1 analysis on the state of the UK telecoms market today.

3.34 In **Chapter 5**, we outline our proposed principles for future regulation of telecoms. We set out three options for the approach that regulation could take in achieving these principles; deregulation, a referral under the Enterprise Act, and delivering real equality of access.

3.35 Delivering real equality of access is our preferred option. In Chapters 6-10 we describe this option more fully. Securing equality of access in the supply of enduring bottleneck assets is key to this option, and in **Chapter 6** we outline our proposals for this. We believe that there needs to be a new regulatory 'contract' with BT and we set this out in **Chapter 7**. In **Chapter 8** we then explain why we believe current generation broadband to be the bridge between the old telecoms sector and the new, and we outline our proposals for its regulation. We then outline our regulatory proposals for each of a number of other key parts of the telecoms market: voice, narrowband data, next generation core networks, next generation access networks, services for large business customers, and mobile. In **Chapter 9** we discuss the need for consumers to be able to make well-informed choices and to switch easily between suppliers in order for the market to function effectively, and set out some possible policy approaches. In **Chapter 10** we then discuss why universal service will be even more important in future to establish a floor of affordable services for all citizens.

3.36 **Annexes A to E** cover the process of the Telecoms Review. They provide Ofcom's consultation principles, the consultation response cover sheet, the terms of reference to the Telecoms Review and a glossary. All of these annexes are bound together with this document.

3.37 **Annexes F to L** provide more detail on our underlying analysis of regulatory options and provide further detail of how our preferred option – delivering real equality of access – could be introduced in a number of specific areas. These annexes are bound under separate cover.

3.38 In addition, we have produced a number of annexes outlining some of the research that Ofcom has carried out in compiling this Review. This includes the outcome of our consumer research. The consumer research annex (Annex M) is bound separately, and the remaining annexes are published only in electronic format; they are available from Ofcom's website.

Next steps

3.39 This consultation will run for eleven weeks, to the beginning of February 2005.

3.40 During the consultation we will be exploring with stakeholders the three regulatory options that we have set out in this document. We will be hosting a seminar on these options in December 2004. In addition, we will be hosting a number of events with industry, consumer groups and other stakeholders to progress the detail of our proposals in particular areas; for example voice deregulation, equivalence and consumer information. Finally, we will be hosting events in the Nations and the English Regions to discuss the particular implications of our regulatory options in those areas.

3.41 We will use the debate during the consultation period, and a careful consideration of the responses to this Phase 2 consultation, to help us determine which of the three regulatory options should be pursued. We will also have regard to the progress that BT has made in setting out detailed proposals in areas including equality of access, and the access and interconnection conditions for the 21st Century Network.

3.42 Once we have determined which regulatory option it is appropriate to pursue, Phase 3 will involve detailed implementation planning. The precise activities involved in implementing our requlatory framework will depend upon which option is adopted. For example, they could involve market reviews, adjustment of remedies, guidelines on key regulatory provisions, interpretation of regulatory instruments such as non-discrimination conditions, and conceivably (if Option 2 is pursued) an Enterprise Act referral. In Annex L, we briefly discuss the legal implementation processes that would be required for each of the three regulatory options we have proposed.

3.43 We will be publishing a statement on our regulatory strategy at the end of Phase 3, in spring 2005.

4. Evolution of the telecommunications sector

4.1 Our starting point for this Review, and much of the focus of Phase 1, was how the telecoms sector was likely to evolve. It is, of course, not Ofcom's role to specify how the sector should evolve. However, the logical starting point for a review of long-term regulatory strategy is to form as good a picture as possible of the environment in which the regulation is likely to be applied. This is particularly important when, as in telecoms, regulation itself can have powerful effects on the shape of the market. There would be a danger that we continue to regulate for a market structure which is obsolete; or worse, we could actually prevent the development of the market in a more competitive direction.

4.2 Our conclusion is that the evolution of telecoms necessitates a new regulatory strategy for the sector. In this chapter we explain the reasons for this. We look at a number of different aspects of the evolution of the sector:

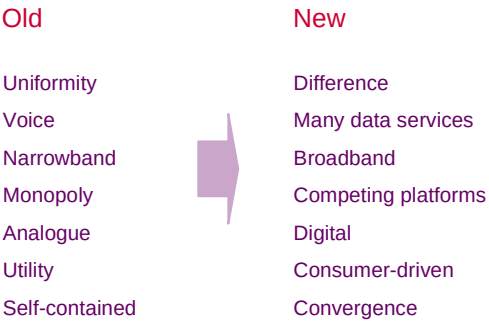
- the technological and other factors that are driving change in telecoms;
- the convergence of telecoms with the media and IT sectors;
- the evolving attributes of a well-functioning market, from the point of view of citizens and consumers; and
- the evolution of telecoms regulation in the UK.

4.3 Finally, we look at the telecommunications sector today and the challenges it is facing.

Drivers for change in telecommunications

4.4 Many Phase 1 respondents described how they believed the telecoms sector to be changing. In broadcasting (which is changing rapidly too) there is a core event – digital switchover – around which these changes can be understood. But our analysis of these responses suggests that telecoms are different. The sector is undergoing very many changes in parallel, and the only real common element is an evolution from the relative simplicity of the past towards the considerable complexity of the future. Figure 3 shows some of the ways that we believe the telecoms sector to be evolving.

Figure 3: Evolution of the telecoms sector



4.5 In our Phase 1 document we suggested that there were a number of technological trends and trends in consumer behaviour which were driving this evolution. We suggested that the over-riding technological trend was increasing performance and declining costs. The trend of increasing computer processing power is well known, but performance increases can be seen to a greater or lesser extent in areas such as fibre-optic bandwidth, spectrum exploitation, compression technologies, power efficiency and battery performance.

4.6 We suggested that a number of changes in consumers' behaviour have arisen as a result of these technology changes (because what were latent demands can now be met) and in turn are now driving further technology change. One of the most important is consumers' demand for always-on connectivity. Our research showed how consumers are demanding connectivity any time, anywhere. Driven partly by changes in lifestyle, consumers increasingly have the expectation of being able to access any aspect of their life at any time. They use a variety of networks and devices, and expect these devices to work together in a seamless manner.

4.7 Ofcom believes that telecommunications is about to undergo a critical transformation. This is because there are a number of technological trends about which commercial and regulatory decisions need to be made soon, and which will fundamentally affect the future shape of the telecoms sector. These trends include:

- **circuit-switched to packet-switched networks**. Many network operators are currently designing next generation core networks (NGNs). For example, BT has announced that its 21st Century Network will be deployed to the majority of its customers by 2008. These networks have the potential to simplify regulation, because a single set of rules on access may be used for many different services (as compared to the service-specific regulation we have today). These networks also have the potential to enhance competition in service provision and application design, if they use open rather than proprietary standards. However, the rules on access to these networks, which need to be developed very soon, will have profound consequences for the extent to which these pro-competitive benefits are realised;
- **increasing intelligence at the edge of networks**. The increasing processing power of devices connected to telecoms networks offers a greater opportunity for software running on these devices to deliver innovative new services. Voice over IP (VoIP) software running on PCs,

such as Skype, is one example. As service providers and others increasingly innovate in this way, it will be critical that the standards environment in telecoms networks allows the benefits of this kind of innovation to be realised by consumers; and

- **demand for higher access bandwidths**. Many Phase 1 respondents pointed out that at some point (many believed in the very near future) the physical bandwidth limitations of the copper local loop would be reached. At this point, other technologies, such as fibre laid beyond the exchange, would need to be widely deployed. The regulation and competitive environment today are likely heavily to influence how rapidly such higher access speeds are available to consumers, and the extent of competition in these next generation access networks.

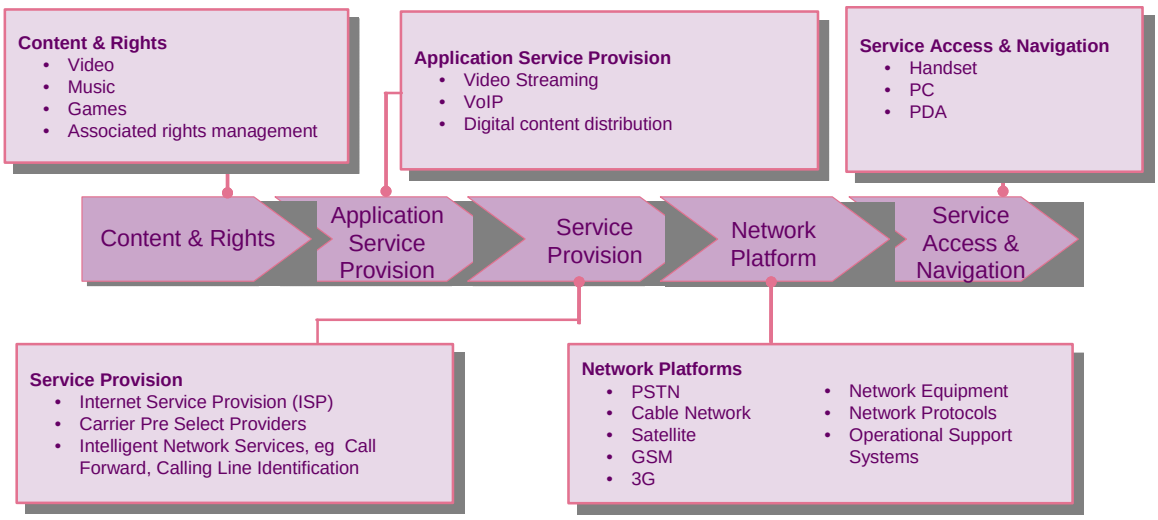
4.8 These fundamental changes in technology and the associated proliferation in new data services are not fully reflected in the existing business models of many in the industry. Revenues for voice services currently substantially exceed revenues for data services, for both mobile and fixed network operators. We believe that earnings from voice services exceed those from data services even more overwhelmingly. So as the telecoms industry advances towards the complex future we describe, we believe that a fundamental change in industry business models is in prospect.

Convergence and the telecoms sector value chain

4.9 Many responses to Phase 1 pointed out that not only is telecoms (in the sense that we traditionally think of it) changing, but that the telecoms sector is also increasingly converging with both the media and IT sectors. It is important that the regulatory strategy that comes out of our Review recognises this convergence, and does not artificially constrain it.

4.10 The telecoms sector value chain, which historically was relatively uncomplicated, is now much more complex. It now involves many activities which would not previously have been thought of as telecoms. There are many ways to represent the telecoms value chain, but Figure 4 shows one possible representation.

Figure 4: Telecommunications value chain



4.11 Network platforms are the part of this value chain which has traditionally been considered telecoms and which has been the focus of regulation. Though handsets and network equipment (for example) have always been essential to delivery of telecoms services, other than in the very earliest period of liberalisation, they have been of little direct interest to regulators.

4.12 Today's telecoms services involve suppliers up and down this wider value chain. For example, consider a music video. A record label, like EMI, would control the content rights. An application service provider, like Real Networks, would provide the application by which the end user accesses the content. A service provider, like Wanadoo, would market and bill for the service. It would be delivered over a network platform that may involve several suppliers. Finally, consumers would access the service using a device such as a PC or a mobile phone.

4.13 Therefore it is no longer appropriate for telecoms regulation to look at the network part of the value chain in isolation. This is for two reasons, which we discuss below:

- networks themselves may decline in importance in this wider value chain; and
- sources of market power may emerge elsewhere in this wider value chain.

Declining importance of telecoms networks in the wider value chain

4.14 Telecoms services – by definition – require a physical network to deliver them, and market dominance in that physical network could always enable the supplier to raise prices to an inefficient level. But historically, control over the physical network was necessary for delivering many other aspects of the service too. This was because the intelligence required to deliver, for example, a videoconferencing service, was embedded within the network itself. Therefore control over the network gave operators a strong position in many other parts of the value chain, such as service provision, application design and systems integration.

4.15 Developments such as open standards and distributed architectures will in principle reduce the ability of network operators to leverage their position across other parts of the value chain. For example, using an open transport standard such as IP and an open session set-up protocol such as SIP, systems integrators and service providers can build very sophisticated network solutions for their customers, purchasing quite basic network components from network suppliers.

4.16 The physical network may not become commoditised. Network operators may be able to differentiate themselves strongly on the basis of reliability, security or latency, for example. But in principle, these trends mean that the physical network should in future represent a smaller proportion of the total value chain than at present. However, caution is needed before drawing the conclusion that regulation of the physical network business will be rendered redundant. There may still be scope to exploit market power in this area,

even in the long term, although the materiality of this effect relative to other competition problems may decline.

4.17 In the longer term, some form of regulation may also be required to facilitate the emergence of competition across this wider value chain. As we discussed in Phase 1, telecoms regulation in future may be as much about ensuring open standards, and fair access to proprietary standards, as about the cost of accessing network elements.

Emerging sources of market power elsewhere in the wider telecoms value chain

4.18 There may also be emerging sources of market power elsewhere which make the analysis and the appropriate regulatory response more complex.

Content

4.19 As the telecoms and media industries converge, the kinds of competition concerns that have arisen in media industries, such as in pay TV, may also become a feature of telecoms markets. Broadband services are already being used to distribute both linear and on-demand video services, and this trend is likely to accelerate. The development of new content services will provide all sorts of important consumer benefits and is strongly to be welcomed. But in pay TV, the combination of exclusive premium rights and a significant customer base within a vertically integrated operator have proven to be a powerful and enduring source of market power. It will be important to ensure that such accumulations of market power are not used to stifle competition.

Application service provision

4.20 Suppliers may emerge who control the applications through which services, such as streaming video or music downloads, are delivered. For example, the majority of users may in future use the same application for streaming audio, just as many people use Adobe Acrobat to upload and download text documents on the internet.

Network equipment

4.21 One component of the telecoms network part of the value chain is supply of network equipment. As standards-setting in telecoms networks increasingly follows the IT industry in being driven by vendors, not network operators, these vendors have the potential to exert market power. For example, a vendor with a strong market position in both network equipment and routers on customer premises could have the potential to leverage any intellectual property in this equipment which is essential for delivery of particular services.

Service access

4.22 Suppliers may emerge who are able to gain market power in many different aspects of service access. These include:

- **operating systems**. Consumers have increasing expectations that multiple devices, running on different networks, are able to interact with one another seamlessly. Control over the software environment in which they do this can confer a very considerable source of market power. Standards battles for the operating system are taking place in games consoles, mobile phones, set top boxes, PDAs and other devices;
- **middleware**. Control over the middleware which controls devices' interaction with telecoms networks may in future be a very significant source of market power. If a device is connected to multiple networks and could use many alternative service providers, this middleware controls which of these it uses. So control over the middleware could allow a supplier to exert considerable leverage over these service providers; and
- **devices**. Suppliers with large market shares in devices such as mobile handsets and PCs could have the potential to leverage their position in determining the operating system used, the applications and bookmarks pre-loaded, and in some cases the service providers (such as ISPs) they recommend.

4.23 In summary, the wider communications value chain may contain a number of possible sources of market power. Ofcom's regulatory approach will recognise this fact. These new potential sources of market power do not necessarily require any specific regulation in addition to the normal application of competition law. But it is important, in determining the appropriate regulation for physical network businesses, that we have regard for the consequences that this regulation could have on the evolution of this wider value chain, and vice versa. Regulation in the wider telecoms value chain is discussed in more detail in Annex J.

4.24 Our examination of the wider value chain has not suggested any dramatic developments which are likely to remove BT's market power in fixed telecoms at a stroke. The local loop assets which confer market power on BT will remain. But the scope for competitive forces to be unleashed throughout the extended value chain makes fixing the core problem of access to bottleneck assets even more critically important.

Attributes of a well-functioning telecoms market

4.25 In the last twenty years, the main focus of telecoms regulation has been to deliver a basic telecoms service – fixed voice telephony – at a competitive price, with guaranteed quality of service, and with the widest possible availability. But Ofcom's consumer research and many of the responses to our Phase 1 consultation suggest that the attributes of a well-functioning telecoms market are themselves changing. This implies a further imperative for telecoms regulation: not only does it need to reflect the technological and competitive evolution of the telecoms sector, but its objectives need to evolve to reflect the changing attributes of a 'good' outcome.

4.26 In this section we discuss what our consumer research and the Phase 1 responses suggest are the attributes of a well-functioning telecoms market going forwards. We divide these attributes into three; we look separately at the interests of citizens and of consumers in general, then we discuss the particular needs of large business customers.

The interests of citizens

4.27 We consider that telecoms regulation has a citizen dimension to it in four areas, which are:

- the impact of telecoms on UK productivity and competitiveness;
- the impact of telecoms on the delivery of public services;
- the need for affordable and widely available basic telecoms services; and
- the need for regulation to reflect the particular requirements of the Nations and English Regions.

4.28 We discuss each of these below.

UK productivity and competitiveness

4.29 A number of Phase 1 respondents argued that telecoms are centrally important to the UK's competitiveness. The direct benefits of an appropriate telecoms policy include lower prices, higher quality, choice for consumers and correct incentives for services innovation. But many argued that the indirect benefits could also be very significant; for example in terms of improvements in the UK's productivity. The CBI made this point when it wrote in its response that:

"*UK businesses of many kinds are facing intensifying international competition and have to add ever more value to their products and services through increasing customisation. To do this, they require highly dynamic and innovative electronic communications networks and services, based on convergence of a mix of telecoms, computer software and database, and content assets*."

A strong communications market also encourages inward investment.

4.30 Our Phase 1 consultation document suggested that at the level of the economy as a whole, there is some academic evidence that take-up of information and communications technologies (ICT) is an important contributor to economic growth. While it is not yet possible to quantify this contribution accurately in Western European countries, research by the Centre for Economic and Business Research has estimated that, due to the growth in the number of broadband connections, annual UK GDP could be up to £21.9 bn higher than it otherwise would have been by 2015[3]. A recent

[3] CEBR (Centre for Economics and Business Research Ltd) report for the Broadband Industry Group, *The Economic Impact of a Competitive Market for Broadband*, November 2003.

survey for British Chambers of Commerce showed that 84 per cent of SMEs identified some benefits from broadband adoption, 46.4 per cent thought that they had benefited from improved productivity, 45.3 per cent from reduced costs and 13.4 per cent from increased sales [4] [5].

4.31 There are many examples of how the adoption of information technology which uses advanced telecoms services has enabled both large and small companies to be more efficient and to provide better services to their customers. Figure 5 gives a case study of these benefits.

Figure 5: Case study: T-Plan's efficiency gains from information technologies using advanced telecoms services[6]

T-Plan is an SME based in Cornwall that provides software test management solutions to a range of clients around the world. The availability of broadband in Cornwall enabled T-Plan to relocate out of the south east to take advantage of lower costs and the improved lifestyle available in Cornwall, thereby creating valuable jobs in a rural location. T-Plan has a dozen virtual offices across the UK with all staff connected using broadband. Broadband has enabled T-Plan to reduce its turn-around time on projects from five to 1.5 days, and enables faster, more effective research and easier competitor analysis. It is also being used to transform client training operations, eliminating the need to run expensive courses at physical locations.

4.32 The example highlights that companies and consumers largely internalise the benefits from adopting telecom services that enhance their productivity. That is, they recognise the benefits which accrue directly to themselves from the adoption of technology and broadband, and grasp the opportunity to do so. This is an important point, because there is evidence that the same is not necessarily true of other factors which contribute to improved productivity. But for companies and consumers to have the opportunity to internalise these benefits, it is necessary to have a healthy and competitive market structure.

4.33 A number of Phase 1 responses suggested that future economic growth will be particularly dependent on the rate at which the UK can move towards widespread availability and take-up of higher bandwidth, next generation access services. They pointed out that the UK is already lagging behind some of its peers in the roll-out of this infrastructure, and suggested that a critical objective for telecoms regulation is to ensure efficient and timely investment in such infrastructure.

4.34 Some respondents also emphasised the wider societal benefits that modern communications can bring. For example, trends such as teleworking could generate environmental benefits in terms of reduced traffic congestion, and improved career opportunities for disadvantaged segments of society.

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[4] *Business Broadband: a BCC Survey*, BCC in association with Cisco Systems and Oracle.

[5] See also Roeller and Waverman, *Telecoms Infrastructure and Economic Growth*, AER September 2001, which looked at the impact of telecoms infrastructure on economic growth in 21 OECD countries between 1970 and 1990 and identified a strong causal link

[6] Source: Intellect

Marconi, in its response to Phase 1, said:

"*as with previous generations of communications advances - canals, railways, phones, motorways – [a vibrant knowledge-based economy supported by broadband communications infrastructure] will stimulate economic growth and deliver social and economic benefits in a wide range of diverse areas such as; efficiency gains for commerce and Government, workforce mobility, transport relief, business model innovation, customer reach*".

Delivery of public services

4.35 The power of ICT and broadband can also be used to deliver public services more efficiently, as the Broadband Stakeholders' Group set out in its consultation response. This aspect of telecoms policy is likely to become even more important following the publication of Sir Peter Gershon's review of public sector efficiency, given the very challenging targets that the review proposes [7].

4.36 These benefits have the potential to be realised across the public sector; for example in education, health, taxation and benefits, and law and order. For example, NHS patient records could be available instantly at any hospital or doctor's surgery in the UK. School curricula, particularly in remote areas, could be supplemented by extra subjects taught by video conference. Figure 6 gives a case study of how advanced telecoms services have already contributed to better public services at a school in Trafford.

[7] *Releasing Resources for the Frontline: Independent Review of Public Sector Efficiency*, HM Treasury, July 2004

Figure 6: Case study: Jeff Joseph School's use of advanced telecoms services[8]

Levels of attainment were historically low at the Jeff Joseph School in Trafford, but the introduction of broadband has helped to promote enthusiasm for research and learning. Jeff Joseph School installed a broadband connection in 1995, long before the Government had made it a priority, enabling the school to participate in a 2 Mbit/s cable modem trial link. The school decided to use its community budget to install new landlines which would give two local primary schools the benefits of its network and connections. The addition of an email server gave all pupils at the school an email address and facilitated communication among students and teachers, while an e-mentoring project enabled students to email a website and get help with course work.

In 2000 the Government stepped up funding, and the school was able to expand its broadband link to a 10 Mbit/s connection. The increased bandwidth enabled the school and the LEA to set up a link in a nearby house on a deprived council estate. The school's wireless network also helps teachers to combat truancy by registering pupils anywhere in the school, at the beginning and end of every day and in every lesson. It will also be made available to parents so that they can see their children's attendance records. Before the school introduced broadband, Jeff Joseph was a failing school, and was losing an average of 90 pupils each year. Since gaining Specialist School Status however, the school has 250 new pupils each year and a waiting list.

4.37 Telecoms also play a critical role in responding to disasters or attacks, and in national security. One feature of a well-functioning telecoms market is that it should be resilient in the event of such emergencies.

Affordable and widely available basic telecoms services

4.38 Whatever services are available for sophisticated telecoms consumers, many responses to our Phase 1 consultation emphasised the importance of certain basic services being available to all. ICSTIS argued in its Phase 1 response that, "no member of any community should be disadvantaged by an absence of an essential service, which telephony is". The benefits of inclusivity via social, cultural and network externality effects are large. However, there are a number of reasons why individuals' need for basic access may not be met by competitive forces. These include:

- affordability: individuals may have difficulty affording basic telecoms services;
- geography: without intervention, even basic telecoms services may not be provided in some areas; and
- special needs: for example, blind and deaf people need special services that enable them to make use of basic telecoms services.

4.39 Some responses also suggested that the services that should be considered basic should evolve over time to reflect changes in the market;

[8] Source: Department for Education and Science

for example to include broadband. For instance, Mason Communications argued that, "there must now be a further argument for including broadband (the definition of which may well increase with time) within the USO [Universal Service Obligation]".

4.40 In October, the Prime Minister also made a significant personal commitment at the Labour Party Conference in relation to broadband. The Prime Minister stated he intended that the Government would "…bring the benefits of broadband technology to every home that wants it by 2008". This highlights that the social benefits of access to broadband are increasingly recognised at the highest levels of Government.

The Nations and Regions

4.41 Another important component of our 'citizenship' duty is to ensure that our policies reflect the interests of the UK as a whole by recognising the particular needs of the Nations and Regions. During the Phase 1 consultation, Ofcom met a range of stakeholders from Scotland, Wales, Northern Ireland and the English Regions, and from these interactions we drew a number of conclusions.

4.42 Whereas two years ago, the principal concern of many in the Nations and Regions was the lack of availability of broadband, that concern has diminished in many areas, as a result of the efforts of BT to extend its roll-out programme, and as a result of direct interventions by devolved and other local democratic institutions. However, the fact remains that a small minority of rural areas remain outside of the reach of BT's programme. These rural areas often also suffer from poor TV and mobile phone reception as well. We believe that further targeted public intervention to provide broadband access for these communities may be the only viable approach in the medium term.

4.43 Even if the immediate problem of roll-out has been addressed, we were struck by the perception of many we met that (with some important exceptions such as Thus in Scotland) BT was the only private sector company willing and able to address consumers' needs in the Nations and Regions. Although companies such as NTL, Thus and Cable & Wireless do have a strong regional presence, we noted the danger of a gap developing between an overall regulatory approach based on promoting competition, and a perception that little competitive activity is actually taking place within these parts of the UK. Ofcom will be examining this specific problem in more detail in 2005, and before that we will be examining ways to produce more detailed consumer research and information about suppliers within the Nations and Regions. With this firm evidence base, we will look at barriers to competition and identify any changes or adjustments to our regulatory approach that are required.

4.44 Many respondents also noted that radio spectrum is an important resource which can be very powerful in promoting regional solutions to particular technology opportunities or problems. Ofcom recognises the importance of this point and will take account of it as we develop our strategic approach to spectrum management.

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4.45 In this section, we have explored four ways in which our interests as citizens provide an important foundation for Ofcom's work. Our policies will be designed to maximise the economic benefits to the UK from extensive and competitive telecoms markets, and to ensure that the resultant benefits are enjoyed by all in society including the vulnerable, and throughout the Nations and Regions.

The interests of consumers

4.46 As well as the evolving citizen interest in a well-functioning telecoms market, the consumer interest is also changing. We use the word 'consumer' to mean any telecoms user, and in this section we distinguish between three different types of consumer; residential consumers, SMEs and large businesses.

4.47 We have two main sources of evidence on what attributes a well-functioning telecoms market would deliver for consumers; the responses to our Phase 1 consultation, and the extensive programme of consumer research which Ofcom has carried out. More details of this research programme are provided in Annex M.

4.48 These two sources suggest that a well-functioning telecoms market would provide:

- **choice**: this has a number of dimensions including:
  - different solutions for an increasingly diverse set of consumers;
  - high levels of innovation;
  - ability to simplify purchasing;
  - a range of services from a diverse set of sustainable suppliers;
- **price**: quality services at competitive prices;
- **information**: informed consumers who are able to make well-informed choices; and
- **low switching barriers**: ease of switching between suppliers.

4.49 We discuss each of these in turn below.

Different solutions for an increasingly diverse set of consumers

4.50 As the range of available telecoms services expands, so does the diversity of consumers in the market. Consumers vary enormously in the sophistication of the services that they consume and in the way that they interact with the market. Large businesses have always been very sophisticated purchasers of telecoms, and obviously have very different requirements to residential consumers. But even within residential consumers, sophisticated consumers may purchase broadband and mobile services as well as fixed telephony, and be comfortable shopping around for the best deal. Others may buy only fixed telephony, and be very unlikely to shop around for the best deal. Others yet may have very particular requirements, for example on account of a disability.

4.51 A well-functioning market would be flexible enough deliver appropriate solutions to all of these diverse groups. Yet it may be impossible to deliver all things to everyone, because of the differing priorities across groups. Sophisticated early adopters of telecoms are likely to care most about the rate of innovation for new services and the level of choice available. Less sophisticated users are likely to care more about lower prices, and may actively resent any changes to the way they consume basic telecoms services. Our consumer research sought to understand the requirements of these different types of consumers, by segmenting residential and SME consumers into a number of different groups.

Innovation

4.52 Many Phase 1 consultation responses suggested that early access to innovation in telecoms services is more important now than it has ever been. Many made the point, discussed above in the context of the citizen interest, that innovation was particularly important to the UK's economic performance. But there is a consumer dimension to innovation too. For example, many of the mobile operators pointed out how successful the mobile market had been at delivering innovative new services to consumers, and how consumers had benefited by adopting new services like text messaging and pre-pay packages.

4.53 What conditions are conducive to such innovation? BT pointed out that investment in innovation is risky for suppliers and that in a well-functioning market "high rates of return (as a result of successful innovations) and services which never recover their costs will both be seen". Most respondents identified effective competition as the bedrock of innovation – in other words, healthy and sustainable competition was the best means of achieving innovation that met customers' needs. Some alternative network operators suggested that infrastructure competition was a necessary pre-condition for a truly innovative market. For example, C&W argued that:

"the ability of BT to weaken network competitors' ability to construct fit-for-purpose, fast-to-market innovative products for their customers means that retail operators are limited typically to competing primarily on price rather than innovation in services".

Equally, many service providers pointed out the importance of retail competition for innovation.

4.54 More generally, there was a sentiment among all types of telecoms operator that where there is a trade-off between low prices today, and faster introduction of new products and services in future, the latter was increasingly important. As Orange, Equant and Wanadoo put it:

"*Ofcom must take a longer term view to regulation based on the benefits that truly sustainable competition can bring, rather than focusing on short term price cuts achieved through regulatory intervention or regulated arbitrage".*

Ability to simplify purchasing

4.55 Many telecoms consumers now buy a greater range of communications services than ever before, due for example to the increasing take up of mobile phones, internet and digital TV. Our research shows that simplifying the purchasing process by making consolidated purchases of multiple services from one supplier is an attractive option for some consumers. A well-functioning market would allow consumers to do this should they want to – but not if they don't.

4.56 There is some evidence that the higher involvement residential consumer segments have a desire for bundled purchasing options. In total, a quarter of customers currently purchase at least two of their telecoms services (phone, internet or multi-channel TV), from the same supplier and most are satisfied with this purchasing behaviour.

4.57 A desire to simplify purchasing is particularly prevalent among SME consumers. 82 per cent of SMEs cited bundling as an important attribute when selecting a supplier, compared with less than 5 per cent of residential consumers in the fixed line, mobile and internet markets. 16 per cent of SMEs claim to have reduced the number of telecoms suppliers they use, and around three in ten purchase a higher proportion of services in bundles than previously [9].

Range of services and suppliers

4.58 The importance of choice in a well-functioning market was a key feature of many responses. For example, Centrica wrote that:

"a key attribute of a well-functioning market is… the availability of consumer choice, that is a broad spectrum of services and products available from a variety of providers, at a range of price points, which meet the various consumer requirements".

4.59 Many respondents to the consultation also emphasised the need for the level of competition to be sustainable. The responses sent a clear signal that some degree of consolidation in the market was likely, and indeed necessary for the long term health of the sector. For example, C&W argued that "the level of investment required for NGNs can only be generated by a smaller number of strong competitors", and that "it is also important that the regulator takes care not to artificially prop up competition where it is neither sustainable nor efficient". BT pointed out that business failures were a feature of well-functioning markets. It said that:

"in a well functioning market there will be many unsuccessful as well as successful new services. Innovations may fail as either demand does not materialise or the technological challenges prove far harder, and more costly to solve, than anticipated".

Ofcom, it argues, should not intervene to keep unsustainable business models alive artificially.

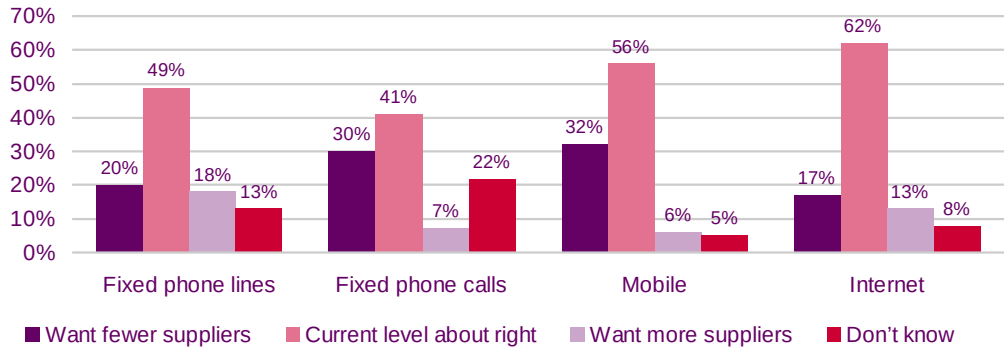
[9] Oftel residential research, November 2003

4.60 From the consumer's point of view, some responses suggested that though choice is important, a wide choice combined with a lack of understanding among consumers created confusion. Connect and CWU argued that, "in some sectors of the market consumers feel bewildered by the range of choice and the complexity of tariff structures".

4.61 Ofcom's residential consumer research bears this out. Consumers have different levels of choice available to them depending, for example, on where they live. But for consumers to consider using alternative suppliers, they need first to be aware of them. Current awareness of alternative suppliers is highest in the mobile market and lowest for fixed calls. Just over four in ten (44 per cent) mobile decision-makers are aware of four or more networks or service providers, whereas over six in ten (63 per cent) of fixed telephony decision-makers were unable to name a single supplier of fixed calls other than their own.

4.62 Residential consumers are generally satisfied with the amount of supplier choice that they have, especially in the mobile and internet markets where around six in ten stated that the current level of choice is sufficient. Comparatively few consumers (in all cases less than one in five) wanted more choice in any of the telecoms markets, and a significant number (for example, one in three in the fixed calls and mobile markets) wanted less. Residential consumers' opinions on the level of choice largely reflect their level of interest in different services. Those with a greater interest in particular services want more choice, while those with a low interest in telecoms want less choice. Figure 7 summarises the results of our research.

Figure 7: Opinions on the current amount of supplier choice in each telecoms market, residential consumers[10]



Quality services at competitive prices

4.63 Low prices have long been the benchmark by which telecoms markets, and by extension the success of regulation, have been judged. Almost all of the Phase 1 consultation responses mentioned low prices as a critical feature of a well-functioning market.

[10] Source: May-June 2004, MORI survey: 1586 UK fixed line decision-makers, 1030 UK mobile decision-makers, 715 UK internet decision-makers

4.64 However, a number of telecoms operators suggested that other desirable features of the market could suffer from a blind focus by Ofcom on lowering prices. They emphasised that prices needed to be sustainable; i.e. they had to be at such a level that delivering the service was profitable for suppliers.

4.65 Many telecoms operators suggested that the best way to achieve such conditions would be for regulation to focus on creating well-functioning wholesale markets, allowing retail markets to be governed by the normal forces of competition. For example, Centrica wrote that:

"a well-functioning retail market should have an active wholesale market supporting it, competitive in those areas where it is economic and efficient for services to be provided by multiple players, non-competitive and tightly regulated where it is not economic to do so".

4.66 Ofcom's consumer research confirms that for many consumers, price remains a principal determinant of choice. However, price is rarely a factor that is considered in isolation. Around half of residential decision-makers cite price-related issues as the primary consideration in their choice of telecoms supplier for each of fixed, mobile and internet, and around one fifth stated quality of service. While price is similarly important across all residential consumer segments, quality of service is of relatively greater importance among consumers with a higher level of interest in telecoms. SMEs typically place more importance on quality of service – generally as much emphasis as on price.

Consumer information to enable informed choices

4.67 Many responses highlighted that a well-functioning telecoms market needs to supply consumers with the tools that they need in order to manage the choices available to them. The National Consumer Council argued that:

"consumers need the opportunity to benefit from a well-functioning market. To do this individuals need easy access to clear and comprehensible information about what choices are available to them, and which choice best suits their individual requirements, in terms of price, quality and range of services offered".

4.68 Ofcom's Consumer Panel argued that:

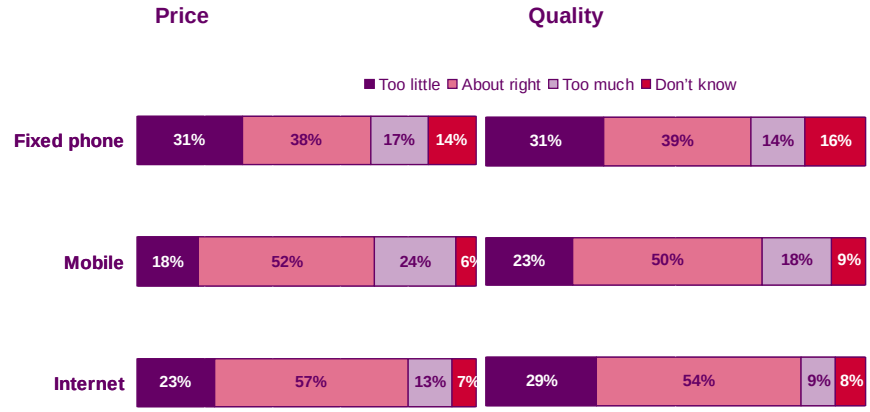
"the information available to consumers in this complex and fast-changing market is often confusing or patchy. This is a situation that is deeply unsatisfactory for consumers and one that in the end will be damaging for the industry's relationship with its customers".

4.69 While all stakeholders agreed that clear and impartial information was an important feature of a well-functioning market, some stakeholders argued strongly that the market already provided this sufficiently to those consumers who wanted it. T-Mobile argued that:

"it is not in [mobile operators'] interests to confuse customers over price, choice or quality of service… Ofcom should avoid intervening here to correct this perceived consumer confusion as there is sufficient indication that the market will continue to respond to this phenomenon".

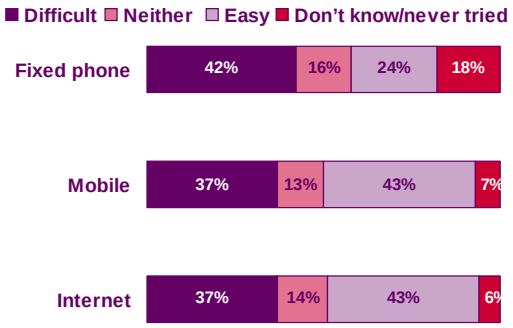
4.70 Ofcom's research suggests that many consumers think that the amount of reliable information available is often about right. As Figure 8 shows, this varies by market and with the type of information. Around one in three residential consumers would like to see more reliable information about the price and quality of fixed telecoms services. A similar proportion would like to see additional information comparing the quality of service of different internet suppliers, such as comparisons of alternative services and speeds available.

Figure 8: Perceptions on amount of reliable information currently available, residential consumers[11]



4.71 While many residential consumers are content with the amount of reliable information available comparing suppliers and services, a significant proportion nonetheless finds it difficult to compare prices. As Figure 9 shows, around two in five residential consumers in each market found it difficult to compare the prices of telecoms services and suppliers. In the fixed line market, just one in five said that they found it easy to compare prices.

Figure 9: Ease of making price comparisons, residential consumers[12]



[11] Base: 1) All those with fixed line phone at home and decision-maker (1,586); 2) All those who personally use a mobile and decision-maker (1,303); 3) All with access to the internet at home and decision-maker (715)

[12] Base: 1) All those with fixed line phone at home and decision-maker (1,586); 2) All those who personally use a mobile and decision-maker (1,303); 3) All with access to the internet at home and decision-maker (715)

4.72 In all telecoms markets, there is a slightly greater demand among SMEs than among residential consumers for more reliable information to be available. But the proportion of SMEs who found it difficult to make price comparisons is significantly higher than for residential consumers, particularly for fixed and mobile telephony. This suggests that for many SMEs it is not the availability and reliability of information which is the problem, but its clarity and the ease of making comparisons.

4.73 Large businesses report even greater difficulties comparing price and quality of services across markets, in common with the highest spending SME segments. This is likely to be related to their need for more complex products and their desire to make more sophisticated and robust comparisons than residential consumers and lower spending SME segments.

Ease of switching

4.74 The need for simple and easy switching between suppliers was a feature of many responses. The Association of Communications Service Providers noted that “effective competition must be supported by a smooth switching experience between suppliers that does not introduce an unfair competitive advantage to a dominant provider”. This partly follows the concerns raised about availability of information. If consumers believe that there is insufficient information available they will necessarily find switching a relatively difficult and uncertain experience.

4.75 Ofcom believes that a well-functioning market should make switching supplier very straightforward. For example, it is important that consumers are able easily to bring their number with them should they wish to change supplier. With impediments to switching, consumers will not fully benefit from competition.

4.76 Our research indicates that there is a perception by some consumers that switching involves too high transaction costs – by which we mean the time, energy and financial costs of switching. These were mentioned by around one in five of those who have never switched. As discussed above, awareness of suppliers in the fixed calls market is significantly lower than that in the mobile and internet markets. This may partly explain the lower switching levels in the fixed market in comparison to both other telecoms markets.

4.77 Throughout the switching process consumers assess various trade-offs between the effort required to switch, and the expected benefits of doing so. The amount of time consumers are prepared to invest in order to achieve savings varies both by consumer segment and by market; for example, residential consumers say they are prepared to spend longer searching for a better internet deal than in fixed or mobile markets. The expected monetary benefits from switching also vary by market type, with the highest level of savings desired in the fixed line market. Figure 10 shows the results of our research.

Figure 10: Average desired savings and time prepared to spend to achieve these[13]

	Average monthly desired savings	Desired savings as per cent of average spend	Average time (hours) prepared to spend[14]
Fixed line	£15	58%	0.5
Mobile	£8	31%	0.5
Internet narrowband	£3	21%	0.5
Internet broadband	£8	32%	2

4.78 The majority of residential consumers have never switched supplier for their fixed line (77 per cent), mobile (67 per cent) or internet (69 per cent), mainly because they do not perceive a need to do so. This is consistent with overall satisfaction levels within each market, which have been stable at around 90 per cent for the past few years.

4.79 The situation in SME segments is similar. The majority of SMEs have never switched supplier for their fixed line (68 per cent), mobile (62 per cent) or internet (69 per cent), again mainly because they do not perceive a need to do so, followed by the transaction costs of switching. There are indications that these transaction costs are more of an issue for higher spending organisations, perhaps due to the more complicated nature of the products and services that these businesses are buying.

4.80 Transaction costs and disruption are as much a problem for large business consumers as for small businesses and residential consumers. Our research found that many large businesses had such complex telecoms requirements that changing supplier was perceived to be a major upheaval. The transaction costs of running full, formal tendering processes could also be very significant for large businesses. Some were also concerned about the migration processes involved in switching between suppliers; for instance, in downtime between dropping one service and the next being available, or the need for an engineer to visit.

4.81 Ofcom agrees with many respondents that ease of switching is essential to a well-functioning market. But our consumer research indicates that there is no great desire among consumers to switch. Most would rather avoid the transaction costs involved, and place high requirements on the benefits they would need to get from switching to motivate them to do so. As switching confers benefits on all (because the discipline it exerts on firms' behaviour benefits all who purchase services, even if they don't themselves choose to switch) if very few consumers can face the transaction costs of switching, this implies a problem in the market which could have a negative impact on all of us.

*

[13] Source: May-June '04, MORI survey: based on median savings/mean spend. Base of 1586 UK fixed decision-makers, 1030 UK mobile decision-makers, 715 UK internet decision-makers

[14] Source: May-June '04, MORI survey: 569 UK fixed decision-makers willing to spend time, 627 UK mobile decision-makers willing to spend time, 287 UK internet decision-makers willing to spend time

4.82 The outcome of the Phase 1 consultation and our consumer research highlight the value that consumers place on innovation as well as keen pricing. But they also highlight the difficulties that consumers face when exercising effective choice. Both of these conclusions have important implications for our policy approach.

Evolution of the large business market

4.83 As previously noted, a wide range of low-priced telecoms services is critical to the health of the UK economy. This is particularly true of those telecoms services sold into the business market. While some of the economic benefits claimed for residential broadband are somewhat speculative, there is already a body of evidence about about the transformative effects of new telecoms technologies on companies' internal business processes, and on the way in which companies work together. It has been recognised for several years that business-to-business ('B2B') services are likely to lead the way in relation to the deployment of new technologies, with business-to-consumer ('B2C') services following.

4.84 Our approach to regulation needs to take account of a number of important trends in relation to the types of services sold to the business market, and the way in which these are sold:

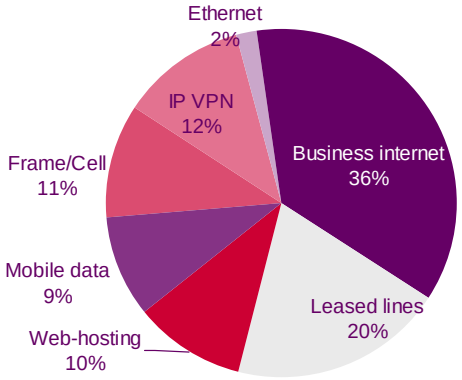
- **operational outsourcing**. Companies are making an increased use of operational outsourcing, across a wide range of business processes. Such companies wish to purchase complete telecoms solutions; for example, to purchase Virtual Private Networks (VPNs) or Managed Data Services rather than individual leased lines;
- **convergence of ICT and telecoms**. These complete solutions tend to encompass Local Area Network (LAN) as well as Wide Area Network (WAN) applications. As discussed earlier in this chapter, this results in traditional telecoms suppliers competing against systems integrators such as IBM and EDS in a broader IT and telecoms market;
- **diverse access requirements**. The extent to which the access bottleneck constrains competition varies substantially across the business market, and can even vary substantially within a single supply contract. There may be several competing access infrastructures for a large head office in central London, but most suppliers are likely to be dependent on BT for access to branch offices or retail outlets. Suppliers need to be able to offer a complete solution, encompassing all these forms of access;
- **countervailing purchasing power**. At the top end of the business market, large corporate customers have substantial purchasing power, and may be able to exploit this in the way they run tenders; and
- **the international dimension**. The largest corporate customers may be purchasing services on a global basis, not just in the UK. In such circumstances UK-based operators may be competing with international suppliers to provide services spanning a number of different national markets. The relative availability of wholesale access services in different markets is a key issue in their ability to compete for such contracts.

4.85 We also need to take account of the impact of technology trends on the business market. Many of the relevant trends are the same for the business market as for the residential market. However, as already noted, the business market does tend to lead the deployment of new technologies, for example:

- **fibre deployment**. There has been an extensive deployment of fibre networks to serve business sites. Many major business centres now have several competing sources of fibre infrastructure;
- **the move to IP networks**. Many large businesses are using their private managed networks to deliver voice services – with voice being just another application carried over the network. This sector leads the way in the adoption of voice over IP solutions; and
- **increased bandwidth**. The trend towards increased bandwidth applies just as much in the business market as the residential market, but the starting point is different, as are the commercial drivers. For example, the bandwidth requirements of hosting centres are forcing a migration from traditional Synchronous Digital Hierarchy (SDH) leased lines to new technologies such as Gigabit and 10-Gigabit Ethernet. These technologies will often use existing fibre, but deliver much lower cost per unit bandwidth.

4.86 Figure 11 shows how these trends are reflected in the current make-up of corporate consumers' spending on data services.

Figure 11: Corporate data services technology share of revenues[15]



Evolution of telecoms regulation in the UK

4.87 So far in this chapter we have discussed the changes to the market which may necessitate a change of emphasis or approach in regulation. But we believe that there is one more reason why there needs to be a new strategy for telecoms regulation in the UK. This is that two decades of telecoms

[15] Source: IDC (from research commissioned by Ofcom)

regulation in the UK has (with the benefit of hindsight) failed to find a satisfactory means of addressing the problems of lack of equality of access and enduring economic bottlenecks.

4.88 In Phase 1, we set out in some detail the decisions that have been made in the past on the trade-offs inherent in telecoms regulation. It is possible to divide the history of UK telecoms regulation into a number of different phases:

- **the duopoly years** (1984-1991). In this period, there were regulated duopolies in both fixed telecoms (BT and Mercury) and in mobile (Cellnet and Vodafone). In fixed telecoms, the privatisation of BT in 1984 had created a private sector monopolist, and the imperative was to reduce the prices of a relatively homogeneous product: fixed voice telephony (mobile was then a relatively niche service). It was hoped to achieve this through a combination of price controls and emerging competition from Mercury (now C&W). Mercury was not required or expected to build an alternative access network, and relied upon continued regulation of BT in consequence to support its business;
- **post duopoly market and infrastructure competition** (1991-1997). In this period, regulation aimed principally to promote infrastructure competition, particularly in access. In mobile, the policy was successful. The two additional network operators (Orange and One2One, now T-Mobile) proved sustainable, stimulated price competition and service innovation in the market, and eventually were able to provide a real competitive threat to the two incumbents. In fixed telecoms, there was a wave of investment in different types of infrastructure; access infrastructure (such as the cable operators and COLT's metropolitan access business), and core networks (such as Energis). However, these new infrastructure-based operations were slow to win market share from BT and to achieve sufficient scale to threaten BT's market power; and
- **services competition (1997 onwards)**. In this period, partly as a result of the implementation of the 1997 EU Directives, regulation aimed to promote more equally service-based and infrastructure-based competition in fixed telecoms. For example, service providers and infrastructure operators were treated more equally in interconnection arrangements. But both types of competition proved slow to take root. Infrastructure-based operators continued to struggle to achieve scale, while network-based operators and service providers were frustrated by delays and inadequacies in wholesale access products such as indirect access, carrier pre-selection and wholesale line rental.

4.89 What lessons should we draw from this? We believe that UK telecoms regulation has yet to overcome the problems of enduring economic bottlenecks and lack of equality of access to these bottlenecks.

4.90 By an enduring economic bottleneck we mean a part of the network where not only does one operator have significant market power (SMP), but where effective, infrastructure-based competition is unlikely to emerge in the medium term. In many markets it has proved to be very hard for such competitors to overcome incumbency advantages. Often this is due to the cost economics of building competing infrastructure. In some cases, it may also be due to other features of the market, such as barriers to customers

switching suppliers in numbers sufficient to make competitive provision economic.

4.91 Such bottlenecks were less important in the provision of mobile services, where the fact that massive market expansion came after the new entrants were in the market, combined with the lower minimum efficient scale of mobile networks, meant that competitive entry proved sustainable and entry barriers lower than in the fixed sector.

4.92 The problem of enduring economic bottlenecks has proved more problematic for fixed telecoms operators who compete on the basis of their own access infrastructure than for those that compete in core networks. Cable networks have made an important and valuable contribution to competition in the access provision. But unlike certain other countries, cable has never become the default distribution platform for pay TV in the UK, and its geographic spread remains limited. The unlikelihood of further cable network build in the near term was highlighted recently when NTL announced its intention to commence an expansion strategy based on unbundling BT's local loop.

4.93 Of course, many companies other than cable operators have entered the UK fixed telecoms market in competition with BT. But any fixed operator not owning its own access infrastructure has faced a second problem: lack of equality of access. In practice any such operator who does not have its own access network relies upon BT's access network, purchased from BT at wholesale rates. The problem of lack of equality of access is that regulation has so far allowed BT to provide that access on different terms to its wholesale customers and to its own retail activities. Those who rely on BT to provide such access have experienced twenty years of slow product development, inferior quality, poor transactional processes, and a general lack of transparency. Such customers of wholesale access from BT have consistently claimed, therefore, that they are disadvantaged in competing with BT in the retail market.

4.94 Ofcom believes that a new regulatory strategy needs to address these problems head-on. We believe that there is an opportunity to work with the grain of technological change in telecoms to promote effective and sustainable competition. We lay out the options for such a regulatory strategy in the following chapters.

The UK telecommunications sector today

4.95 It is very important that our proposals for a regulatory strategy to promote competition in telecoms are practical given where the industry is today. So in the final part of this chapter, we briefly reiterate our Phase 1 analysis of the state of the UK telecoms market.

4.96 Figure 12 replicates the analysis that we published in our Phase 1 report in April, and measures the benefits to the consumer from the UK's telecoms sector. The scores were intended to be illustrative only. The table assessed the sector's performance based both on comparative measures (for example, is there more competition in the UK than abroad?) and absolute measures (for example, how much competition is there in the supply of mobile voice telephony?).

4.97 In terms of benefits to consumers, we believe that the UK's telecoms sector is generally performing quite well, with some exceptions. In fact, since this analysis in April we believe that there are prospects for improvements in some areas. Service providers using carrier pre-selection have continued to grow market share, and now offer services over 4.2 million lines [16]. The price cuts to LLU services that BT announced in May offer the prospect of LLU-based competition which could significantly increase the service choice and level of competition in internet access.

Figure 12: Performance measures of benefits to the consumer from the UK's telecoms sector (as published in Phase 1 of our Review)

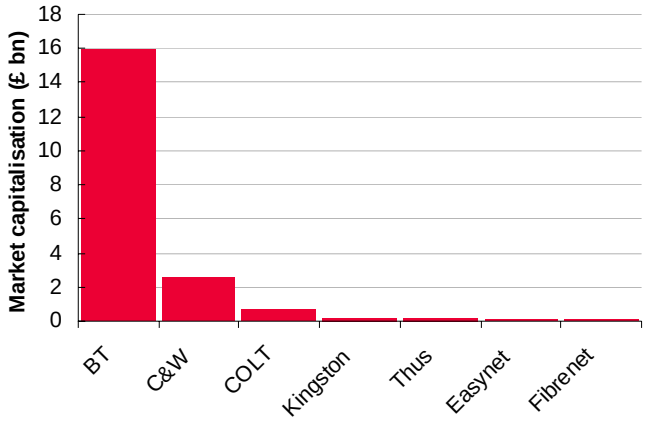
	Price	Quality of service and customer satisfaction	Service choice	Access to services	Competition
Fixed voice telephony	UK residential prices compare well with other countries; business prices above average	Very high levels of SME and residential consumer satisfaction; declining incidence of faults	Wide range of tariff structures and bundling options	Near ubiquitous take-up, only 1 per cent of households do not own either a fixed or a mobile phone	More competition in calls and access lines than other countries. Much of the call competition is from service providers, using alternative long-distance networks. BT still provides most access infrastructure
Internet	Narrowband and entry level broadband prices compare well with comparable markets; higher speed broadband more expensive	High satisfaction with broadband, lower satisfaction with connection speeds of narrowband	Full range of narrowband price structures. Some choice of broadband connection speeds, contention ratios, but flexibility in price structures only just emerging	Ubiquitous availability of narrowband. Broadband only available recently in many areas. Other areas need a 'trigger' level of demand in an exchange, and some households and exchanges not DSL enabled	Many service providers, but none with market shares over 30 per cent. Infrastructure provision largely provided by BT and cable companies. Almost all DSL lines use BT's access infrastructure
Mobile	Prices for pre-pay are lower than many other markets, and the UK is also relatively competitive in post-pay pricing	High overall satisfaction, although less satisfaction on cost and value for money. Incidence of dropped calls improving	3G services starting to become available but slow roll-out by incumbent operators. A full range of 2G and 2.5G tariff packages and devices is available	Mature networks cover almost all population and all except remote areas. Near-ubiquitous take-up amongst younger consumers; voice and text message usage increasing	High (licensing) barriers to entry at the network level, but the least concentrated market in Europe. Some new service provider competition, but many existing service providers now bought by network operators
Corporate network services	Published leased line prices are above European average	High levels of overall satisfaction with suppliers and reliability of service; less so for value for money and customer service	These services are the key focus of many Altnets. Competition has encouraged development of bespoke and tailored solutions	Most large corporate businesses are using some form of data network service. They may be reliant on BT infrastructure for some services	At least six players with significant market share although BT still retains around half the market; more for lower capacity leased lines

Key: ● Good ○ Poor

[16] Source: Ofcom market intelligence, September 2004

4.98 Though it may be delivering benefits to consumers in many areas, not all is healthy in the UK telecoms sector. As we noted in Phase 1, BT continues to have market power in most fixed telecoms markets despite twenty years of competition. And the degree of competitive pressure exerted on BT by alternative carriers and service providers today may even diminish in the medium term if the regulatory status quo is maintained. Much of the competition that has emerged has done so because of the existence of high prices resulting from BT's historic monopoly position. Competitors have been able to enter the market and make returns by competing against those high prices. But as prices fall, the inherent advantages accruing to BT as a result of its scale and its ability to exploit its vertical integration will become increasingly important. This problem has been compounded by entry focusing on short-term arbitrage opportunities which result from the structure of pricing (e.g. geographic averaging, or constraints on the rebalancing of call and line rental prices). As prices fall and arbitrage opportunities diminish, entrants must develop the scale to compete with BT and the ability to overcome the inherent advantages of vertical integration. At the moment, neither of these conditions exist in the market, which we believe is one reason why so many of BT's competitors are currently experiencing very difficult trading conditions. Figure 13 shows how BT's market capitalisation continues to dwarf those of other fixed telecoms operators listed in the UK.

Figure 13: Market capitalisation of UK-listed fixed telecoms operators, November 2004[17]



4.99 The fragmentary nature of competition and consequent lack of scale partly results from past regulatory decisions. For instance, as a consequence of changes and emphasis in regulation since 1984, BT's competitors are located up and down the value chain; they have very different business models, and those with networks have deployed them to very different scales. This in turn fuels demands for multiple forms of regulatory intervention, with the inevitable problem that these interventions may be mutually contradictory in effect.

[17] Source: Reuters

4.100 Meanwhile, the problem of inequality of access has continued to prove difficult to address. For example, carrier pre-selection took five years before a fit-for-purpose wholesale product became available. A fit-for-purpose Wholesale Line Rental product is still in development. The 2001 LLU process was beset by serious problems, which are only now being addressed.

4.101 It would be wrong to conclude that regulation alone is responsible for the ills of the sector, or indeed that the regulator has control of all the necessary levers to effect a positive transformation of the fortunes of the sector. For instance, we can aim for a regulatory regime which rewards operations with economies of scale, but we cannot ourselves make consolidation in the sector occur. We can however, provide a clear framework which addresses some of the internal contradictions of the current regulatory regime and some of its enduring problems. In the following chapters, we set out our principles and the options for a future regulatory strategy.

5. Regulatory principles and approaches

5.1 In Chapter 4, we discussed how the telecoms sector is evolving, and why telecoms regulation also needs to change. We believe that a coherent and forward-looking approach to telecoms regulation is required, based upon a number of clear principles.

5.2 In this chapter we set out the principles which are intended to provide coherence and clarity to telecoms regulatory policy. We then describe three options for regulatory approaches to achieve these principles.

Regulatory principles

5.3 We propose seven principles for telecoms regulation. They are that Ofcom should:

1. promote competition at the deepest levels of infrastructure where it will be effective and sustainable;
2. focus regulation to deliver equality of access beyond those levels;
3. as soon as competitive conditions allow, withdraw from regulation at other levels;
4. promote a favourable climate for efficient and timely investment and stimulate innovation, in particular by ensuring a consistent and transparent regulatory approach;
5. accommodate varying regulatory solutions for different products and where appropriate, different geographies;
6. create scope for market entry that could, over time, remove economic bottlenecks; and
7. in the wider communications value chain, unless there are enduring bottlenecks, adopt light-touch economic regulation based on competition law and the promotion of interoperability.

5.4 The first two of these principles address the problems of enduring economic bottlenecks and lack of equality of access. We believe there are substantial benefits from competition based on infrastructure, but recognise that, for some types of network, in some geographies and customer densities, it may not be economically feasible for competitors to roll out infrastructure all the way to the customer. Where this is the case, we believe it is essential that alternative network operators are able to secure equality of access to customers, and accountability on the part of the owner of the bottleneck asset for providing such access.

5.5 In practice, these first two principles relate more to wired (i.e. fixed) networks than to wireless networks. There is already competition between five mobile networks, all of which provide end-to-end services over their own infrastructure, and which (as discussed in Chapter 4) do not show the same problems as fixed networks in terms of economic bottlenecks. Of

course, some persistent regulatory problems, notably call termination, may require continued intervention. As we discuss in Chapter 8, there is also a case for retaining the ability to conduct periodic market reviews in mobile markets. Nonetheless, much of this document (and the bulk of telecoms regulation today) relates to fixed, wire-based networks.

5.6 The first three principles relate to the depth within the network at which we believe that regulatory intervention should be focused. This depth has two dimensions. Geographically, depth means roll-out as close to the customer as possible. In terms of network layers[18], it means a focus on wholesale products at the deepest level in the network possible.

5.7 These deep levels in the network are not the only points at which we envisage competition taking place. On the contrary, we believe that regulation targeted at the right level will allow competition to unfold at other levels in the value chain too; based on commercial relationships rather than on regulation. The wholesale market for unmetered narrowband internet provides a good model of this. Oftel's regulation of the access bottleneck (through the introduction of Flat Rate Internet Access Call Origination, or FRIACO) encouraged companies to compete to offer the requisite infrastructure services to internet service providers.

5.8 The third principle addresses the need to ensure that regulation is withdrawn quickly where it is no longer required, for example because competitive conditions have changed or technology has moved on. To provide predictability, where possible we will set out the indicators that would prompt a review of regulation in this way. These indicators may be forward-looking.

5.9 The fourth principle, to promote a favourable climate for efficient and timely investment and innovation, relates to the issues we raised in Phase 1 concerning the 'contract' between the regulator and regulated companies, in particular where we intervene directly to set charges. It applies particularly to our approach to regulating next generation core and access networks. We discuss in Chapter 7 our views about the need for the evolution of this regulatory contract.

5.10 The fifth principle recognises that, as telecoms markets and as regulatory solutions develop, different geographical areas may experience different competitive conditions. Some areas already have a higher concentration of alternative infrastructure than others. In some areas, it is much more costly to supply customers than in others. In Annex F we discuss the circumstances in which it would be appropriate to define different markets in different geographies, or apply different remedies to different areas within a nationally-defined market. We note that these could not be markets included within the scope of universal service, where a geographically averaged price is a requirement of the universal service order.

5.11 While our policy recognises that there are enduring economic bottlenecks in telecommunications today, the sixth principle recognises the potential for new technologies, many of them wireless, to change the traditional economics and competitive conditions of telecoms networks. Ofcom is

[18] For example, dark fibre is a deeper layer of the network than a fully managed service.

working to reduce the barriers to entry in the provision of wireless services. We will shortly publish consultation documents on our Spectrum Framework Review, which will include an implementation plan of forthcoming proposals to open up the market for spectrum and create scope for further competition.

5.12 In Chapter 4 we also discussed the increasing importance of the wider value chain to the regulation of telecoms. Competitors elsewhere in the value chain could be an additional source of competitive pressure working to erode existing bottlenecks, but there could also be competition problems which arise in that part of the value chain itself. The seventh principle is that, for the wider value chain, unless there are enduring economic bottlenecks, we will be a light-touch regulator. We will predominantly seek to address issues of market power using competition law, not sector-specific regulation. Where appropriate, we will seek to promote open standards and interoperability. In Annex J we discuss the regulation of this wider value chain in more detail.

5.13 We believe that a coherent and forward-looking approach to telecoms regulation is required, which reflects the changes taking place in the telecoms sector and the evolving attributes of a well-functioning telecoms market. We believe our proposed principles address this need. We are putting forward three options for regulatory approaches that could be adopted to reflect these principles. In developing these options, we have considered a whole range of different types of competition in telecoms, and a range of regulatory instruments that could be applied. We provide a discussion of these theoretical considerations in Annex F.

5.14 We set out these options in the rest of this chapter. They are:

- **Option 1: Deregulation:** remove sector-specific regulation and rely on using the Competition Act to address any remaining problems;
- **Option 2: Reference under the Enterprise Act:** assess whether any feature or combination of features of a market prevented, restricted or distorted competition in a way which requires remedies going beyond Ofcom's powers under the Communications Act and the Competition Act; and consider making a reference under section 131.
- **Option 3: Real equality of access:** focus regulation on enduring economic bottlenecks, and tackle the problem of inequality of access head-on.

Question 1.	*Do you agree with Ofcom's proposed principles for regulation of telecoms markets?*
1 a)	*What regulatory role should Ofcom play in the wider telecoms value chain?*
1 b)	*How should Ofcom reflect differences in competitive characteristics in different geographic areas?*[19]

19 More detailed questions on this issue are listed in Annex F.

Option 1: Deregulation

5.15 We stated in Phase 1 that the first consideration for the Review would be 'why regulate at all'? We have considered whether there is a case for the immediate, across-the-board withdrawal of sector regulation in some or all of the market. Coherent arguments can be made in favour of such an approach.

5.16 First, regulation is not a cost-free or risk-free activity. It imposes significant direct and indirect costs on the industry and consumers. There are significant practical problems associated with the effective execution of regulation, for instance problems of regulation lagging the market and information asymmetries. And there is a real danger that the law of unintended consequences applies to regulation, with well-meaning interventions having unfortunate consequences. However, these arguments, while highlighting the inherent problems of regulation, would be convincing only if we considered that what would happen in the absence of regulation would not be substantially worse for consumers.

5.17 Second, some argue that regulation actually gets in the way of competition rather than promoting it. In particular actions by regulators to force down high prices or claw back supernormal profits from a regulated company may have the consequence of deterring other companies from entering the market. This suggests that regulators should get out of the way and allow the market mechanism to fix these problems itself.

5.18 Assessing this theoretical argument depends on the realistic scope for further entry into different parts of the market. In markets characterised by high levels of innovation and low barriers to entry, we believe that there is a strong presumption in favour of letting the market work. For most of the telecoms value chain, as we have said, this is exactly what we see emerging. But on the evidence available to us, our conclusion is that there is a core set of enduring economic bottlenecks in telecoms which it is very unlikely in the short to medium term will be eroded by further competitive activity. If we simply stepped out of regulation as far as these bottlenecks are concerned, there would be no competitive constraint on monopolistic behaviour and consumers would suffer in consequence.

5.19 However, it could be argued that even if there are residual problems of market power, Ofcom should withdraw from sector-specific regulation and rely on the Competition Act alone to police these problems. The arguments against such an approach are that competition law may not allow for the clarity, certainty and precision of intervention that is necessary to give all parties – including companies who have market power – the confidence to plan their businesses and make significant investments. There is a danger that key decisions become embroiled in lengthy and complex litigation. We discuss these arguments in more detail in Annex F.

5.20 While the option of an across-the-board withdrawal of regulation is very attractive, we believe there are significant practical problems with pursuing an approach of this kind. We welcome views on this.

Question 2. *Where and to what extent should Ofcom rely on ex post competition law rather than ex ante regulatory conditions?*

Option 2: Reference under the Enterprise Act

5.21 Many commentators, and indeed some respondents to our Phase 1 consultation, have claimed that the regulatory problems of the telecommunications sector are so fundamental that they cannot be addressed using our existing powers. They argue that the problems stem from the underlying market structure. The Enterprise Act 2002 includes powers for regulators to make referrals to the Competition Commission of markets where there are reasonable grounds for suspecting:

"….that any feature, or combination of features of a market in the UK for goods or services prevents, restricts or distorts competition in connection with the supply or acquisition of any goods or services in the UK or part of the UK."

5.22 Such an investigation would be wide-ranging. The Competition Commission would be able to impose structural remedies. It could, for instance, examine whether the only solution to the problem of inequality of access is the separation of BT's wholesale network operations and its retail service provision.

5.23 Given the persistence of problems of lack of equality of access after twenty years of intensive regulation, it is perhaps not surprising that the issue of structural separation of BT continues to be discussed. The theoretical arguments for separation are that it would remove not only the means for BT to discriminate in favour of its own downstream operations but also the motive for BT to do so, as legally separated wholesale and retail entities would have no common interest beyond those of a purchaser and supplier. One form of separation would place enduring bottleneck assets in a separate business unit which would be subject to significant ongoing regulation. The non-monopoly parts of the BT business could then be subject to a much less intensive regulatory regime, as the scope for discrimination would be much diminished.

5.24 On the other hand, BT has argued that there are a number of benefits to its vertically integrated structure. For example, it argues that it is better able to co-ordinate investments, because it in effect has an anchor customer for new developments. Others have argued against this, pointing out that other complex industries which are not vertically integrated (such as aircraft manufacture and airlines) co-ordinate investment and innovation successfully. BT also argues that its integrated structure allows it to secure a lower cost of capital when raising finance.

5.25 There are also significant practical issues associated with separation. One of these is whether the boundary between the business units and activities to be separated can be clearly identified at a time of rapid technological change. It may not be clear exactly what the bottleneck elements of BT's business are, because new technology might render what is currently monopolistic competitive or vice versa. In that case, a division of the business runs the risk of either making the cut in the wrong place, or rapidly being revisited in the light of events.

5.26 Finally, both BT and its competitors have raised concerns about the cost of structural separation and the distraction that it would cause to regulator and the industry. Figure 14 summarises some of the arguments for and against structural separation.

Figure 14: Summary of arguments for and against structural separation of BT

Arguments in favour	Arguments against
Removes incentive and means for inequality of access	Costly to achieve, disruptive to industry and the regulator
Prevents leverage of market power in bottleneck network elements into related markets	Embeds market power in access; could reduce the incentive for alternative access deployment
Allows significant deregulation in parts of the value chain which are not natural monopolies	Could delay or divert investment in the short term; may be risk of poor investment co-ordination
Allows investment co-ordination between all players and their network bottleneck supplier; not just between BT's retail and wholesale activities – could improve investment and innovation across the industry as a result	Hard to determine appropriate line of cleavage; may change over time
	Risk to innovation by BT if it is unable to realise benefits at retail as well as wholesale level
Provides a solution for promoting competition in next generation broadband	May be easier for BT to attract investment funds due to lower cost of capital of an integrated entity

5.27 In our view, the economic arguments for and against separation are finely balanced, but there are strong practical arguments for avoiding the costs and disruption involved in a protracted break-up process if at all possible. However, for the separation issue to be finally laid to rest, it will be necessary to see real evidence of progress towards a regime which guarantees real equality of access. Only where all stakeholders see real evidence of this is it realistic to expect demands for break-up to subside. In common with the majority of respondents to our Phase 1 consultation, we would prefer a solution which delivered equality of access without the disruption and costs of BT's structural separation. However, should such an approach not deliver the results required of it, structural separation may in the long term be the only viable option.

Question 3. *In what circumstances would it be appropriate for Ofcom to make a reference under Section 131 of the Enterprise Act?*

Option 3: Real equality of access

5.28 Central to the application of our proposed principles is the need to tackle the problem of inequality of access head-on. Many responses to our Phase 1 consultation, including those of BT and most of its larger competitors, argued that it was possible to achieve this while retaining BT's vertical integration.

5.29 This option involves the application of Ofcom's proposed principles for telecoms regulation to the current system of *ex ante* conduct regulation. Such regulation would need to be focused on enduring economic bottlenecks – i.e. it would need to be more tightly focused on promoting competition at the deepest levels of infrastructure at which competition will be effective and sustainable. As we discuss above, these levels may vary by product and by geography.

5.30 Equality of access would require significant changes in two areas. At the product level, this option involves the adoption of remedies in markets where BT has SMP which ensure that there is equivalence in the provision of products by BT to its wholesale customers, and to its own retail activities. But we also believe that certain changes to BT's behaviour are necessary to diminish the incentive, and any means, to treat wholesale customers unfairly, and to increase the transparency of its treatment of its own retail activities.

5.31 We are aware that past experience in other sectors shows that regulation designed to remove the scope for discrimination may lead to voluntary structural separation because the costs of compliance are so great, and many benefits of vertical integration are effectively removed. While any future decision on structure is of course a matter for BT and its shareholders, it is worth stating that we believe our proposals to apply equality of access should not impose disproportionate costs on BT. We therefore do not consider that delivering equality of access would lead inevitably to the separation of BT.

5.32 This option forms a package. Regulation of enduring economic bottlenecks would be made more effective. But regulation would also be targeted more precisely on these bottlenecks, and effective regulation at these levels will enable withdrawal of regulation at other levels. For example, if regulation is effective in delivering equivalence in wholesale call origination, it will be possible to withdraw regulation from retail voice markets.

5.33 Because it addresses the problem of inequality of access without the cost and disruption of the structural separation of BT, this is our preferred option. In order to stimulate the most constructive debate possible through the consultation period, the rest of this document sets out in some detail what this option would imply for particular areas of regulation:

- **achieving equality of access**. In **Chapter 6**, we discuss how we believe real equality of access to regulated wholesale products can be achieved through a combination of changes at the product level, and behavioural changes by BT;

- **the regulatory contract**. In **Chapter 7**, we discuss the implications of our approach for the regulated returns that BT is permitted to earn from interconnection to its core and access networks;
- **regulation of key markets**. In **Chapter 8**, we outline our specific proposals for current generation broadband, voice and other narrowband services, next generation core networks, next generation access networks, access products for business customers, and mobile;
- **exercising consumer choice**: Our proposed principles are designed to promote effective and sustainable competition in telecoms. An efficient market requires both that suppliers can compete with each other and that consumers can make effective choices between suppliers. This may require greater focus on measures to promote transparency of pricing and other information, and in **Chapter 9** we discuss how this could be achieved; and
- **universal service**: As competition develops, it will be increasingly important that consumers are able to access a basic level of affordable services. Both the definition of USO, and the way that it is funded, may need to change over time. We discuss this evolution in **Chapter 10**.

5.34 We provide further detail of specific areas of regulation in Annexes F to L.

Question 4. *Should Ofcom adopt a broad approach of focusing regulation on enduring economic bottlenecks while tackling the problem of inequality of access head-on?*

6. Achieving equality of access

6.1 If Ofcom is to be successful in promoting effective and sustainable competition, we believe that we need to ensure that equality of access is provided to bottleneck assets, and that the owner of the assets is accountable for providing such access. We discussed the problem of lack of equality of access to bottleneck network elements in Chapter 4.

6.2 The economics of wired (i.e. fixed) networks are such that it is hard to compete against the incumbents' economies of scale, in particular in deploying the last mile access networks which connect all the way to customers. Yet if operators do not control this link to the customer, they are reliant on the incumbent to provide such access on wholesale terms, usually at the insistence of the regulator. Without regulation to ensure equality of access, the incumbent has an incentive to provide this link on inferior terms compared with the service it provides to its own retail activities, disadvantaging its competitors in the retail market. In the UK this is particularly so because price controls on wholesale access to BT's network limit the returns BT can make at the wholesale level. As such, BT has few incentives to respond to the demands of other wholesale customers, and strong incentives to undermine competition at the retail level by restricting the ability of retail operators to compete on a fair basis.

6.3 Competition has delivered very substantial benefits to consumers in the last twenty years; for example, in terms of much lower prices and enhanced choice. But the clear consensus of the responses to Phase 1 was that even though substantial effort has been focused on it over the last twenty years, the problem of lack of equality of access has yet to be resolved. For example, C&W argued that:

"In the world of broadband, BT was allowed to create an LLU product which was prohibitively expensive, not industrialised and not fit-for-purpose, which meant that it was entirely unsuitable for mass-market take-up. The result is that there is currently virtually no competition in broadband based on LLU."

We believe that similar stories could be told about carrier pre-selection, wholesale line rental, partial private circuits, and indirect access in their early days.

6.4 If effective and sustainable competition is to be achieved in fixed networks, this problem has to be solved. As well as promoting competition, solving the problem of lack of equality of access to bottlenecks holds the key to further relaxation of regulation in the sector. If equality of access is achieved at the wholesale level where BT holds SMP, and if effective competition is achieved as a result, it could be appropriate for Ofcom to adopt a more light-touch approach and withdraw from regulation in many other areas of the market. For example, controls on voice services retail pricing could be relaxed.

6.5 We acknowledge that the problem of equality of access has proved to be the most intractable problem of telecoms regulation to date. But many responses to Phase 1 pointed out that it is very timely for Ofcom to be looking at how it might be solved. This is because BT is currently in the

process of designing its 21st Century Network. There is therefore a one-off opportunity to build the principles of equality of access into the network and the operational support systems (OSS) around it.

6.6 We believe that equality of access can be achieved without the structural separation of BT, and this chapter discusses how this might be achieved. We believe it involves both changes at the product level, and behavioural change by BT. We discuss each of these below. Equality of access is an area where it is important that we define our proposals in some detail, and we provide this detailed discussion and some more specific questions in Annex G.

Change at product level

6.7 A core element in achieving equality of access is that BT's wholesale customers should have access to the same or a similar set of wholesale products, at the same prices and using the same or similar transactional processes, as BT's own retail activities. We refer to this concept as equivalence.

6.8 Equivalence has a number of dimensions. The three key areas are:

- **product:** including the features, functionality and quality of service of the wholesale product;
- **process:** including the processes for forecasting, ordering, provisioning and fault repair of the wholesale product, as well as the systems they depend upon; and
- **price:** covering the price of the various aspects of the wholesale product.

6.9 These are not static requirements. It is also important that there is equivalence throughout the product development process and product life cycle. Equivalence implies that all BT's wholesale customers (rival operators as well as BT's own retail activities) have the same ability to introduce changes or have problems addressed; for example in provisioning, fault management and billing.

6.10 There are two models of equivalence, which we have called equivalence of outcome and equivalence of input. Equivalence of outcome implies that the wholesale products that BT offers to its wholesale customers should be comparable to those that it offers to its own retail activities, but the product and processes need not be exactly the same so long as any differences are not material. This type of equivalence can be applied with different levels of rigour.

6.11 Oftel's approach might be characterised as accepting certain differences of outcome which arise from the existence of asymmetrical inputs for BT's downstream businesses and those of third parties, provided these were not material, or deliberately or perversely created by BT to impede competition. Oftel worked to ensure that wholesale products specifically designed by BT under regulatory pressure were as close to being fit-for-purpose as possible. But clearly this approach has not resolved the continuing

problems of lack of equality of access in a number of areas. Firstly, BT faces weak incentives to comply, and as a result the achievement of fit-for-purpose products which BT itself has no interest in using or selling has required a high degree of regulatory intervention. Secondly, the process permits differences between the treatment of BT's wholesale customers and its own retail activities which, while relatively insignificant in isolation, constitute significant disadvantage when taken in combination.

6.12 We believe that a more rigorous version of equivalence of outcome could be put in place through a combination of requiring wholesale products to be re-engineered, setting clearer definitions and enforcing SMP conditions (such as those on undue discrimination) in a way which guaranteed equivalence of outcome.

6.13 The second type of equivalence is equivalence of input. Under this approach, BT's wholesale customers would be able to use exactly the same set of regulated wholesale products, at the same prices and using the same systems and transactional processes, as BT's own retail activities. In principle, equivalence of input delivers many advantages over equivalence of outcome. It generates better incentives to BT to improve the products it offers to its competitors, it increases transparency, it is easier to monitor compliance, and it would require less on-going intervention by Ofcom. It therefore offers greater potential to solve the problem of inequality of access in a sustainable fashion. However, it may be costly to introduce for some existing products.

6.14 Ofcom is proposing a number of principles as to how these types of equivalence should be applied to products in SMP markets, consistent with the main regulatory principles set out in Chapter 5:

- equivalence of input should be enforced when the cost is proportionate, such as for all new wholesale products, processes and systems;
- when the cost is significant, equivalence of input should be used at specific levels in the value chain; and in this case equivalence of input should be introduced at the deepest levels in the network at which competition will be effective and sustainable going forwards;
- although the points at which competition will be effective sustainable may change, the points at which equivalence of input should be applied should nonetheless be clear, simple, and provide certainty; and
- if it is inappropriate to enforce equivalence of input, equivalence of outcome should be required.

6.15 Ofcom's initial review of the existing products to which equivalence could be applied is shown in Figure 15.

Figure 15: Applying equivalence to existing regulated wholesale products

Product	Rationale (based on the principles set out above)
Local loop unbundling	LLU is likely to be a key regulated wholesale product (as described in Chapter 8) and it is critical to achieve equality of access.
DataStream	Will be the key broadband access product in areas where LLU is not viable but is likely to be superseded by a next generation bitstream product.
Wholesale leased lines (TISBO[20]) (e.g. PPCs)	Critical access product today for operators serving business customers. For equivalence of input to be applied substantial product re-engineering would be required and products such as PPCs may have a relatively limited life as demand moves towards Ethernet-type products. This might limit the justification for major re-engineering to deliver equivalence of input.
Wholesale leased lines (AISBO[21]) (e.g. wholesale LES, backhaul extension service)	These products will be critical going forward both for LLU operators and also for operators serving the business market.
Wholesale line rental	Product is critical for competition in voice telephony which can be carried through under the 21st Century Network. Current product is not fit-for-purpose, but product design lends itself to equivalence of inputs.
Carrier pre-selection	Product now provides reasonable level of equivalence.
FRIACO	Product for unmetered internet access increasingly superceded by broadband access products, with declining usage.
Indirect access	Product increasingly superceded by Carrier Pre Selection.

6.16 In addition, there are many products that BT does not use itself such as interconnection circuits and migration products. Neither model of equivalence described above will help achieve the principle of equality in these cases. Ofcom would consider a number of alternative approaches to address these products including product re-engineering, setting service standards, imposing price equivalence and proactively identifying where issues may arise.

Question 5. *How can real equality of access be achieved at the product level?* [22]

[20] Traditional Interface Symmetric Broadband Origination
[21] Alternative Interface Symmetric Broadband Origination
[22] More detailed questions on this issue are listed in Annex G

Behavioural change

6.17 Change at the product level will go some way to delivering real equality of access, but we believe that it will not by itself be sufficient. Ofcom believes that in addition certain behavioural changes in the way BT conducts its internal business are necessary to reduce or remove the incentive to restrict equality of access.

6.18 A number of specific examples of unfair treatment of BT's wholesale customers have been highlighted to us by respondents during the course of the Review. These include:

- **preferential knowledge of product innovation.** For example, through group activities such as those led by the Chief Broadband Officer, or through management or board meetings, BT's retail activities could access earlier information on major developments such as product feature changes, technical information and price changes than wholesale customers are able to access;
- **influencing wholesale product and process investment priorities**. BT's retail activities could be able to exert more influence than its other wholesale customers over product development and process changes. This is magnified by what wholesale customers often perceive as an ineffective consultation process during the planning and development of new products. BT's retail activities could be able to secure faster product development as a result;
- **better quality processes**. For example, in some months this year over 40 per cent of BT engineer WLR appointments have been missed;
- **more retail competitor intelligence**. BT's retail activities could become aware, via staff or systems common with its wholesale activities, of the activities of its retail competitors; and
- **cost allocation**. BT has the incentive to load costs at the wholesale level away from a product where BT has a high retail market share, towards products where it has a low market share.

6.19 We recognise that BT currently applies significant resources to regulatory compliance. For example, to date it has put over 50,000 team members through a compliance course. Yet BT's wholesale customers tell Ofcom that unfair treatment along the lines outlined above does in fact regularly occur. Ofcom believes that however much resource BT puts into compliance, the root of the problem is that the in which way BT conducts its internal business creates both the incentive and the means for unfair treatment of this nature.

6.20 At this stage we do not wish to propose any specific solution to this problem and it is not Ofcom's role to design BT's internal organisation. Rather, we believe as a first step BT should develop rapidly a set of proposals which address the root causes of industry concern in this area. Responses to Phase 1 of this Review suggested an array of solutions which BT could adopt. They broadly fall into two categories; removing inappropriate incentives, and providing transparency.

6.21 Removing inappropriate incentives could be achieved through remedies such as changes to the location of certain functions within BT's organisation, separate management groups for BT's different businesses, reducing the role of group activities, different staff locations and discrete internal IT systems – and this partitioning would need to be closely aligned with the points at which equivalence was applied. Providing transparency is necessary to show that there is no unfair treatment, and to aid monitoring and enforcement. Particular solutions could include more transparent accounting information, and a commitment to external verification of internal policies and procedures.

6.22 In general, we do not believe that BT's different divisions should be prevented from collaborating to the benefit of citizens and consumers. But we do believe that all BT's wholesale customers should have the same ability to collaborate with BT in designing and implementing wholesale products and processes as the opportunities afforded to managers responsible for BT's retail activities.

6.23 Achieving equality of access is the critical problem for regulation of telecoms. Behavioural change by BT is key to this; it provides the incentives and the means, and it makes BT accountable for providing equality of access. We discuss this in more detail in Annex G.

Question 6. *What behavioural changes by BT do you believe would be necessary to achieve real equality of access?*

7. The regulatory contract

7.1 The last chapter discussed how achieving equality of access would have different implications at different parts of the network: regulation would be more focused on achieving equality of access to enduring economic bottlenecks, and this would allow deregulation elsewhere.

7.2 It is very important that in setting the regulated returns that BT is permitted to make from wholesale access to its network, Ofcom reflects the varying competitive characteristics of the different parts of BT's network. These regulated returns need to give the right incentives to BT. This is particularly important now, given the major changes to BT's business that are in prospect; delivery of equality of access, investment in the 21st Century Network, and investment in next generation access networks.

7.3 We refer to the process of setting the regulated returns that BT is permitted to earn from wholesale access to its network as the regulatory contract; this is not a real contract but a settlement between Ofcom and the industry. Such a 'contract' needs to reflect the proposed regulatory principle that we set out in Chapter 5 that Ofcom should take a consistent and transparent approach to regulation, so as to promote efficient and timely investment. In this chapter we discuss how this regulatory contract would need to evolve should Ofcom pursue the option of focusing regulation on delivering real equality of access.

The regulatory contract

7.4 In utility industries, it is often the case that the regulator intervenes to set retail and wholesale prices. This can involve a complex calculation of acceptable rates of return, likely rate of investment, and the careful identification of the parts of the business to which these calculations apply (the 'regulatory asset base'). In setting, for instance, forward-looking price caps the regulator aims to give clarity as to the approach that will be taken on these issues for a given period – an explicit regulatory contract with the regulated company. This allows for the regulated business and the wider market to plan with greater certainty, given a predictable regulatory environment for the period in question.

7.5 We believe that three core considerations should affect the regulated return that BT should be permitted to make from providing wholesale access to different parts of its network. There are sometimes trade-offs to be made between these considerations. The considerations are:

- **relative importance of incentives for BT to invest**. Where investments are risky, it is important that regulated returns reflect the degree of risk that BT faces at the time that it makes the investment, in order to provide incentives to invest. It is also important that we should specify our expected approach for a significant period of time so as to provide BT and others with a degree of planning certainty;
- **scope for investment by competing network providers**. Regulating the returns that BT may make from parts of its network may discourage

investment by others in competing infrastructure. If effective competition as a result of such alternative infrastructure is in prospect, it is important that regulation does not harm such prospects; and

- **the need to protect the consumers from excessive charging** for services provided in parts of the network which are enduring economic bottlenecks. If there is no prospect of consumers being protected through effective and sustainable competition, there is a greater need for regulation directly to protect consumers from excessive pricing. In terms of setting wholesale prices for the use of such bottleneck assets, the relevant principle is that prices should be set at a level that allows a reasonable return on an appropriate valuation of these assets.

7.6 These considerations apply very differently between the different parts of BT's network. There is scope for effective and sustainable competition in many parts of the core network. Because of the scope for innovation and competition, regulation of BT's returns is less important to protecting consumers. Similarly, as network operators consider making substantial investments in next generation core networks, it is particularly important that regulation allows sufficient incentives to make efficient investment.

7.7 However, in current generation access networks, there is much less scope for effective and sustainable competition. Therefore, regulating BT's returns is the principal method of consumer protection for this part of the network. Until the investment is made in next generation access networks, the main asset on which a return needs to be provided is the copper access network, which is already in the ground

7.8 In the remainder of this chapter, we discuss the assessment of the regulated returns that BT should be permitted to make in three parts of its network; the core network, current generation access networks and next generation access networks.

The core network

7.9 In the core network, the most significant way in which Ofcom continues to set charges and effectively determine BT's returns is through Network Charge Controls (NCCs). NCCs are a set of rules governing the prices that BT can charge for access and interconnection services in a number of narrowband markets where it has SMP. The current set of charge controls come to an end in September 2005. We will be consulting formally on the next controls early in 2005, and have already begun discussions with stakeholders. Ofcom's website contains further information and questions on NCC issues[23].

7.10 The next controls will apply to a period of transition. BT will be migrating to its new 21st Century Network. BT has stated that the principal reason for making this investment is the cost savings it will lead to, by allowing traffic for a range of different services to be carried over a single core network.

[23] Further information on the issues covered by that project is available on Ofcom's website at http://www.ofcom.org.uk/ind_groups/ind_groups/telecommunications/netchacon/. This web address includes details of how you can contact the project team to ask questions or to contribute your views to our consultation process.

Therefore, the NCCs that are appropriate constitute a trade-off: the higher the regulated return, the less risk that regulation will disincentivise efficient investment by BT; the lower the regulated return, the more the benefits from these cost savings can be passed on to consumers.

7.11 The appropriate position that Ofcom should take on this trade-off depends upon the core considerations that we discuss above. These were:

- **relative importance of incentives for BT to invest**. The 21st Century Network investment involves three main types of risk for BT; a technology risk, a cost risk and a market risk. The technology of BT's 21st Century Network is unproven in some respects. The costs of the investment are uncertain. BT also faces a number of competitors in core network provision, and therefore there is a risk to its market share should the implementation be problematic, or should the expected cost savings not be forthcoming. But the market risk to BT would diminish if the access and interconnection arrangements for BT's 21st Century Network limited competition in core network provision; and
- **scope for investment by competing network providers,** and **need to protect consumers from excessive charging.** There is a prospect of effective and sustainable competition in many parts of core network provision. This would imply, as noted above, less need to intervene directly to force down prices for consumers. But many Phase 1 responses highlight the sensitivity of the level of competition to the design of BT's 21st Century Network. So the contestability of the market would also diminish if the access and interconnection arrangements for BT's 21st Century Network limited competition in core network provision.

7.12 These two considerations imply that the regulated returns that BT should be permitted to earn should be dependent on the access and interconnection arrangements for its 21st Century Network not foreclosing the market; in particular by ensuring equality of access as discussed in Chapter 6. The principles upon which access is provided to the 21st Century Network are therefore critical. As a result of this and other issues, we are issuing a consultation in parallel with this Phase of the Telecoms Review on the key policy issues involved in access and interconnection to the 21st Century Network.

7.13 If access and interconnection to the 21 Century Network was pro-competitive, it would be appropriate for the network charge controls to reflect the degree of risk and the contestable nature of the market. In principle, there are three ways that this could be achieved:

- through reflecting risks in the projected cashflows that BT would generate from its core network;
- through disaggregating BT's regulated rate of return, and using a different rate of return to reflect the varying risks attached to particular investments; and
- through allowing BT to retain cost savings in excess of its cost of capital.

7.14 As well as incentivising efficient network build and appropriately securing benefits to consumers, we consider that the next charge control regime

(and interconnection regulation more generally) should also have the following incentive properties:

- **speed of migration to next generation networks.** We believe that regulation should not create artificial incentives for BT or for other operators to migrate to NGNs inefficiently (whether too fast or too slowly). One way to facilitate this might be if network charge controls were technology-neutral: that is, the same charge would apply to a given existing interconnection service, irrespective of the network over which BT decided to deliver it. New interconnection and access services would then be subject to a separate assessment and, if necessary, separate charge controls as and when they appear; and
- **regulatory certainty during the migration**. We believe that all parties should be able to plan some time ahead, in the certain knowledge of the future prices of interconnection services. This is a good argument for using a four-year period for the next NCC regime, mitigating many of the risks associated with PSTN-to-NGN migration uncertainty by use of the technology-neutral approach and by limiting the services covered by the control to existing PSTN services (regardless of the mode of delivery). However, we acknowledge that many of the interconnecting operators are uncertain as to the rate of traffic migration to NGNs and it may therefore be appropriate to consider a shorter charge control period during this time.

The current generation access network

7.15 The considerations concerning the regulated returns that BT should be permitted to earn from its current access network are very different from those concerning the core network.

7.16 The relative importance of incentives to invest is low. It is important that BT is not disincentivised from investing in next generation access networks, and we consider this below. But the current generation copper access network is already in the ground, and little new investment beyond incremental investment for new-build properties is in prospect.

7.17 Much of the copper access network is not contestable by competing network providers, and as a result there is a strong need for direct consumer protection. The market reviews completed by Oftel and Ofcom found that competition in access networks from mobile and cable does not constitute effective competition to BT in many markets. Therefore in these markets, direct regulation on the return that BT is permitted to make on its assets is the principal means of consumer protection.

7.18 These considerations imply that it is appropriate to look again at the value of BT's current copper access network. Ofcom is reviewing this area and will shortly publish a separate consultation on the valuation of BT's copper local loop which will consider the merits of the different methodologies for future regulatory calculations. By considering this issue in an open and transparent way, we hope to provide the certainty required by the industry consistent with an implicit regulatory contract.

Next generation access networks

7.19 The considerations concerning the returns that BT should be permitted to earn from any investments in next generation access networks are different again. These networks do not yet exist on any scale and the first priority may be to ensure that regulation does not disincentivise efficient investment. Therefore a very different approach to the regulation of BT's investments may be appropriate. We discuss regulation of next generation access networks in more detail in Chapter 8.

Question 7. *How should Ofcom reflect the competing considerations of efficient investment and consumer protection in determining the regulated returns that BT may earn from its network?*

8. Regulation in key markets

8.1 In this Chapter we discuss the implications of our preferred regulatory approach – delivering real equality of access – for regulation in a number of key markets. We look at the following areas of regulation in turn:

- **current generation broadband services**. We believe that current generation broadband provides a bridge between the past telecoms environment and that of the future. Vigorous competition in current generation broadband is likely to facilitate competition in voice and in the next generation of broadband services. Therefore, competition in current generation broadband is our top priority market;
- **voice and other narrowband services**. In voice markets, we believe that technology may provide an opportunity to withdraw initially from PSTN-specific regulation and, in time, from voice-specific regulation. We have developed some specific proposals for the conditions which would have to apply for a staged withdrawal from such regulation;
- **next generation core networks**. As core networks are upgraded to NGNs, it is important that the regulatory rules for access and migration to NGNs are defined. In this section we briefly discuss the regulatory issues around access to NGNs, and the importance of the arrangements for access and interconnection for NGNs conforming to our proposed regulatory principles;
- **next generation access networks**. Next generation access networks pose a different set of imperatives and opportunities to the regulation of existing infrastructure. It is important that regulation does not delay efficient and timely investment in these networks. At the same time, the deployment of a new access infrastructure offers the opportunity to develop competitive structures that avoid the regulatory battles of the last twenty years;
- **access products for business consumers**. The specific, regulated wholesale products which are used to serve business users will need to evolve as the underlying technology changes. In time, there may be scope for greater deregulation for the very largest corporate customers in certain geographies, for whom there may be sufficient end-to-end competition between different providers; and
- **mobile**. Since there is much greater competition in access infrastructure in mobile networks than in fixed, mobile has been subject to much less economic regulation. However, detailed and intrusive regulation of mobile call termination is enduring. In this section, we discuss whether there may be alternatives to the current regulatory structure for call termination.

Current Generation Broadband

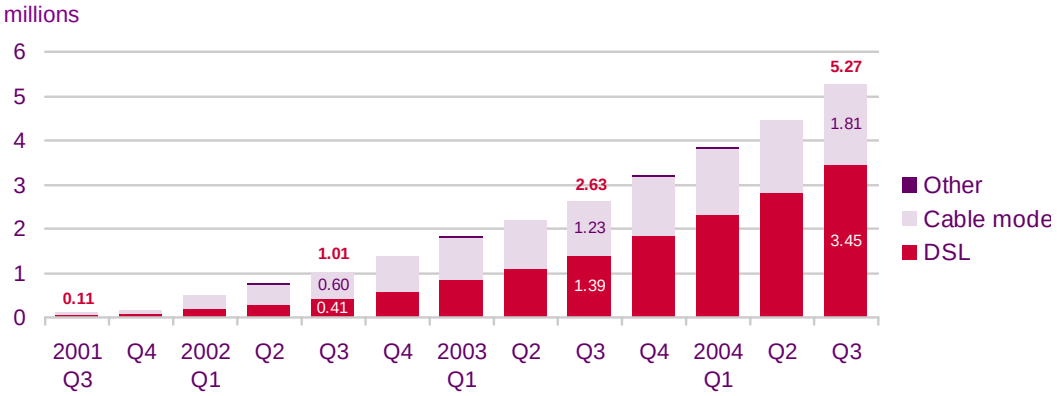
8.2 The regulatory principles we proposed in Chapter 5 emphasise the importance of targeting regulation where it will have the greatest effect. Ofcom believes that current generation broadband represents the bridge between the past telecoms environment and the possibility of effective and

sustainable competition in future across many types of service, based on deployment of infrastructure. Achieving effective competition here is therefore a high priority for Ofcom. When we refer to current generation broadband we are not attempting to define a precise economic market; in essence, we mean the set of services that could be delivered over the existing copper and cable networks without substantial further upgrades, or over wireless networks with similar performance characteristics.

8.3 Current generation broadband is a bridge in this way for a number of reasons. As we discuss later in this chapter, what we currently think of as discrete services offered over their own dedicated infrastructure will increasingly be offered as one of many applications contained within a broadband service. This will include voice services as voice over IP offered over broadband becomes increasingly prevalent. Current generation broadband may also hold the key to rapid and competitive deployment of next generation access networks. As was clear from the Phase 1 responses, at present BT's competitors lack the scale and profitability to contemplate a major investment in new access infrastructure. However, an appropriate regulatory regime in current generation broadband could facilitate the emergence of stronger scale players who are able to access the funds to mount a serious challenge in the next generation of access infrastructure.

8.4 Take-up of current generation broadband is currently growing strongly in the UK. Broadband now accounts for one-third of all internet connections in the UK, and take-up is growing by 50,000 subscribers per month. Figure 16 shows the growth of broadband in the UK.

Figure 16: UK broadband internet connections[24]



Prospects for competition

8.5 BT will have rolled out DSL to nearly all of its exchanges across the UK by the end of 2005. There is competition to DSL from cable in around 50 per cent of households, as well as pockets of competition from fixed wireless networks. There are promising access technologies, many of them wireless, which offer the prospect of further competition in current generation

[24] Source: Ofcom, operators

broadband, particularly in certain geographies and for certain consumer types.

8.6 However, the evidence presented to us suggests that these technologies are not yet mature and/or their business plans are not yet sufficiently proven to attract the funding necessary for mass roll-out. Many of them are likely to serve only particular consumer segments in the short to medium term. We review some of these emerging access technologies in Annex Q.

8.7 3G networks could also provide some competitive constraint to fixed broadband networks. 3G provides lower speeds than many fixed network technologies, and has higher costs per byte. However, 3G has the advantage of mobility. Customers have been prepared to pay a premium for this in the voice market, and it is possible they may also be willing to do so in relation to data services in future. Mobile operators have been very effective at selling service packages rather than raw connectivity. As a result 3G may provide a substitute in some segments of the fixed broadband market, but is likely to be a weak substitute for fixed networks overall all as far as broadband services are concerned.

8.8 For these reasons we do not believe that we can base regulatory policy on the expectation that there will be new mass-market access networks providing effective competition to the existing copper/DSL and cable networks between now and the end of the decade. We need to complement competition from these alternative networks with regulation which allows third party access to the existing BT infrastructure where this is a bottleneck.

8.9 Even if end-to-end competition is not feasible, it may still be possible to aim for competition at all levels of the network except the local loop. This would imply that, as Ofcom has previously set out in the statements on broadband policy that we published in spring 2004, a major focus of regulation would be on ensuring that equality of access to the local loop (via LLU) is offered by BT.

8.10 However, the depth within the network at which competing provision of infrastructure is sustainable may vary by geography. For example, in areas of high customer density, competition is likely to be sustainable in services using LLU and in some cases in backhaul. In areas of lower customer density, competition may be sustainable only in core networks.

Ofcom's policy approach

8.11 We propose to continue the strategy, set out in our earlier statements on broadband policy, of promoting competition within DSL at the deepest level of infrastructure where it will be effective and sustainable. This could involve regulation which promotes competition at different levels of the value chain for different geographies. For example, whereas in dense customer geographies it could promote LLU, it would make access products available further back in the network for geographies with lower customer densities. The actions taken earlier in the year by Ofcom, the Independent Telecommunications Adjudicator and BT have already had a significant impact on plans for LLU, and operators including NTL and Cable & Wireless have announced plans to invest. However, further steps may be necessary

to ensure that LLU is ultimately as successful as we believe it can be, and to achieve the target of operational capability for a million unbundled lines per year.

8.12 As take-up of DSL becomes more widespread, and is increasingly used to offer Voice over Broadband services, it may no longer be sensible for consumers to pay a PSTN line rental as well as a broadband subscription. Providers wishing to provide Voice over Broadband services would need to able to rent access lines from BT on cost-based terms, the cost of which excluded costs specific to the PSTN network, but included the cost of the copper loop. (This service is sometimes referred to as 'naked DSL' .)

8.13 It may be appropriate for Ofcom to require BT to offer such a wholesale broadband access product. A particularly important (and complex) issue that arises is how those costs that are common to PSTN and broadband networks would be recovered. At present, PSTN revenues tend to cover most of the common costs associated with the BT network. As these revenues are eroded, BT will need to recover its common costs elsewhere, and the charges for naked DSL would have to reflect this.

8.14 We believe that some refinements to regulation may be required when BT deploys its 21st Century Network. One of the features of the 21st Century Network is that BT will deploy Multiple Service Access Nodes (MSANs) in place of the current DSL Access Modules (DSLAMs) in local exchanges. BT's stated target is to ensure that, by 2009, broadband dialtone is instantly available to most BT customers in the UK. Consumers will be able to plug a broadband device into their phone line, and immediately be able to subscribe to BT's broadband service just as they can turn on select services today. This will be achieved by migrating all existing narrowband customers onto these MSANs, which will be capable of simultaneously supporting narrowband and broadband services.

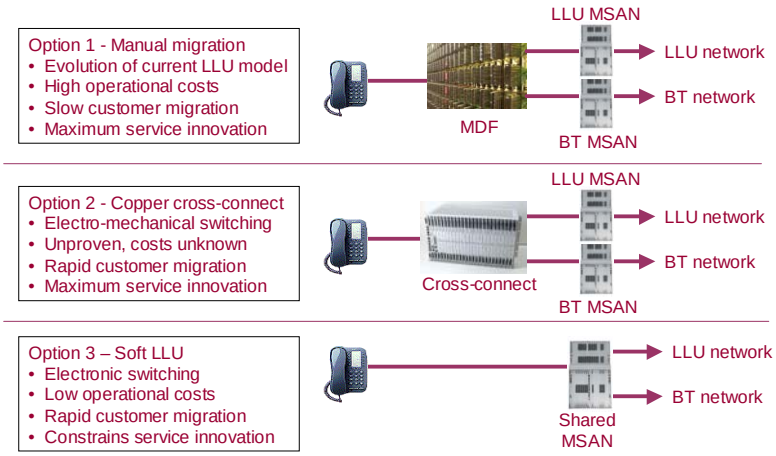
8.15 While seamless migration from narrowband to broadband is clearly beneficial for consumers, it creates a major challenge for LLU-based operators. We suggested in Chapter 6 that LLU is one of the key bottleneck wholesale services, and the migration and provisioning processes for LLU must support the principle of equivalence. However, at the heart of current generation LLU is a manual migration process. Equivalence might be possible as long as BT is also using a manual migration process, but it will be a challenge for BT to design a manual migration process that will continue to provide equivalence once broadband dialtone is widely available. Ofcom believes BT's 21st Century Network must not undermine the principle of equivalence, and that BT should provide a next generation LLU product which addresses this requirement. Possible options, illustrated in Figure 17 below, might include:

- re-engineering the current manual migration process to reduce provisioning timescales. This is likely to be the simplest option, and may deliver near-equivalence, but provisioning timescales are likely to be a few days at best. This could be combined with strict price equivalence (through pooling and spreading of costs);
- replacing the current manual migration process by an automated process using a copper cross-connect in front of the MSAN (probably some form of electro-mechanical switch). This would address the

migration issue, while retaining the key benefit of LLU (an ability to innovate by deploying a separate MSAN); and

- replacing the current manual process by a form of 'soft LLU', under which LLU operators do not deploy their own MSANs, but instead take over a BT line by taking control of the associated line card in BT's MSAN. LLU operators would then pick up the associated transport stream using some form of bitstream interconnection.

Figure 17: Approaches to next generation local loop unbundling



8.16 The migration to the 21st Century Network may also have implications for DataStream. As core networks are upgraded to NGNs, the current ATM-based DataStream product is likely to have to evolve to a service with similar characteristics, but based on Multi Protocol Label Switching (MPLS) technology running over IP.

Question 8.	*Do you agree with Ofcom's proposed approach to current generation broadband?*
8 a)	*What should Ofcom's approach be to naked DSL?*
8 b)	*Should there be different regulated wholesale products for current generation broadband in different locations?*
8 c)	*How should the potential lack of equivalence faced by LLU operators in a 21st Century network environment be addressed?*

Voice services

8.17 We noted in Chapter 4 that voice services are currently critically important to today's telecoms sector; they provide much of its revenues, and most of its margins. We believe that technological change may offer the prospect of more competition in voice services through the emergence of converged voice and data services, which may reduce the need for PSTN-specific regulation. We are proposing a regulatory strategy for voice which is consistent with our proposed principles for telecoms regulation. We propose to promote competition in voice based on the deepest level of infrastructure

where it is likely to be sustainable, and we will ensure equality of access where this is necessary for effective competition.

8.18 In order to stimulate productive debate during the consultation period, we have outlined our proposals in some detail. Annex H contains much of this detail and some specific questions, and we summarise our proposals here.

Prospects for competition

8.19 Competition in voice services is likely to come in future from five sources. They are:

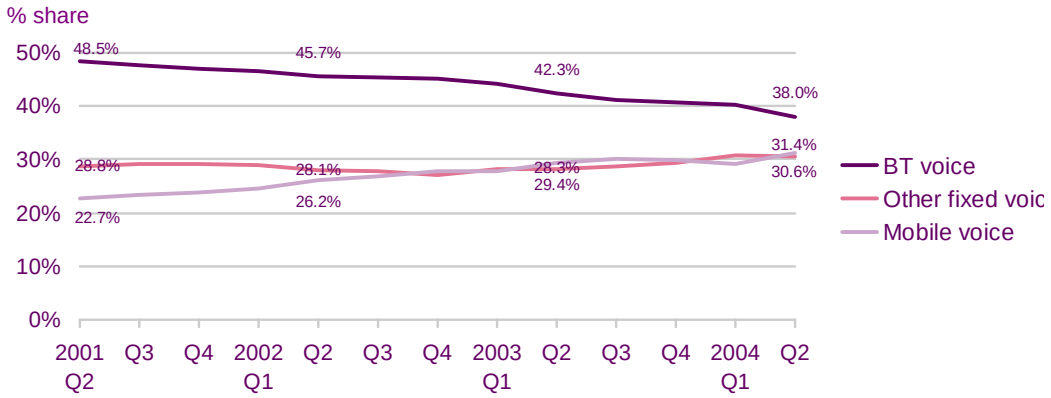
- **service providers using wholesale voice products.** Recently, service providers using carrier pre-selection have been very successful. They now have more than 4.2 million lines [25], and the different types of indirect access supplier have a 20 per cent share of fixed call volumes[26]. We believe that competition from these service providers is likely to continue apace, particularly when a fit-for-purpose wholesale line rental product is available;
- **cable**. Over half of UK homes currently have access to cable, and cable operators have an overall share of 14 per cent of fixed call minutes. The resolution of the financing problems of the cable industry may create scope for competition from cable operators to intensify;
- **mobile.** Mobile voice traffic has grown dramatically in recent years, while fixed voice traffic is now declining. Our consumer research (contained in Annex M) examined the extent to which consumers treated the two services as substitutes. It found that 42 per cent of individuals said that they sometimes used their mobile phone to make a call instead of their fixed phone. However, to date our research suggests that this trend is the result of a behavioural change by a proportion of consumers who particularly value the mobility of the service and/or the functionality of the handset. In future, we believe that there may be some prospects for greater price-driven substitution. For example, 3G networks may give mobile operators capacity for growth which to date has been unavailable, and 3G may be a cheaper technology for delivering voice traffic than 2G;
- **unmanaged voice over IP**. A number of voice over IP providers are currently providing voice services to residential and small business broadband users. These types of operators have been very successful in other countries, such as the USA and Japan. Ofcom wishes to encourage this kind of competition, and we published our consultation *New Voice Services* in September 2004. Competition from these types of service provider is likely to increase. However, these service providers have little control of the quality of service that they offer, and should broadband networks become more capacity-constrained, quality levels may decline; and
- **managed voice over IP.** Corporate customers are already leading the way in running voice over IP over their managed networks. In future, these services will be available to consumers and small businesses too.

[25] Source: Ofcom market intelligence, September 2004
[26] Source: Ofcom market intelligence, June 2004

BT's 21st Century Network may deliver such services. Most importantly, operators providing data access using wholesale access products such as LLU or DataStream could offer voice over IP with managed quality of service too. In this way, we believe there is significant scope for regulated converged voice and data services enabling competition in voice services, with operators competing on the basis of their deployment of infrastructure.

8.20 Figure 18 shows the share of total voice call volumes made up by BT, other fixed operators and mobile operators. It shows the continued decline in BT's share of total voice calls.

Figure 18: Share of total retail voice call volumes[27]



8.21 In parallel to increasing competition from the five sources discussed above, we believe that the move to next generation core networks may result in fundamental changes to the tariff structure for voice services. It may be increasingly common for customers to buy large call packages at a flat rate, rather than paying per call. As networks migrate towards using IP, there could also be major changes to termination rate arrangements, as we discuss later in this chapter.

Ofcom's policy approach

8.22 We believe that technological change offers the prospect of increased competition in voice services based upon the deployment of infrastructure. It may also require the evolution of PSTN-specific regulation into regulation for an IP network which would apply across all services. As competition becomes effective, we would expect to relax voice regulation in retail fixed voice markets; in some cases through adjustments to remedies, in others following the completion of market reviews examining the case for regulatory withdrawal [28].

8.23 In parallel to this evolution, we will facilitate inter-platform and other forms of competition in voice wherever possible. For example, we will work with the

[27] Source: Ofcom, operators

[28] Timings of market reviews will be affected by the updating by the European Commission of its *Recommendation on Relevant Markets*. Ofcom will have a legal duty to review markets as soon as possible after the updating of the Recommendation. This could mean that a full market review would need to be conducted in relation to voice services as early as 2006.

industry to look at termination arrangements, should they be hindering competition between platforms. We will ensure that voice over IP services are not artificially impeded as they enter the market, for instance by examining the case for a capacity-based charging regime for termination as opposed to a pence-per-minute regime.

8.24 Our proposed evolution is in five stages (timings given represent our expectations of when the required competitive conditions will be met):

8.25 **Stage 1 (present): fit-for-purpose wholesale line rental.** Before we can commence deregulation, the basic building blocks necessary to achieve competition in today's voice market need to be in place. We will therefore apply the principle of equality of access to Wholesale Line Rental; we are working on this in parallel with the Review. Our specific activities include dealing with issues of functionality and service performance, and re-examining the question of the wholesale margin based on the valuation of BT's copper access network.

8.26 **Stage 2 (2005): withdrawal from regulation of fixed retail voice markets**. When a fit-for-purpose WLR product has been introduced and competition has strengthened as a result, which we expect to be in 2005, we expect to be able to withdraw from price regulation in the fixed voice retail market: moving from an RPI-RPI price cap to a safeguard cap of RPI-zero. It is likely that the primary source of competition to BT in the retail fixed voice market will at that point come from cable and from CPS and WLR-based service providers. We will also consider whether, on the expiry of the safeguard cap, it is possible to exit from any form of retail price control for the majority of consumers.

8.27 The introduction of fit-for-purpose WLR would also allow us to examine the continued need for detailed rules on price publication and non-discrimination in the retail market. If competitors are able to access BT's wholesale products on equivalent terms, such downstream controls may no longer be necessary. Specific candidates for re-examination are discussed in Annex H.

8.28 **Stage 3 (2006): withdrawal of remedies from first tranche of fixed wholesale markets.** Stages 1 and 2 involve an examination of remedies within retail markets where BT still has SMP at the wholesale level. In addition, we have identified a number of wholesale markets where competition is increasing such that it may be appropriate to withdraw SMP findings and associated remedies. Candidates include wholesale IDD markets on certain routes, and (should the competitive conditions of PSTN networks be mirrored in next generation core networks) certain conveyance and transit markets. We propose to conduct a market review to determine whether continued regulation is required.

8.29 **Stage 4 (2008-2010): evolution of remaining fixed wholesale voice markets.** BT plans that the majority of its customers will be connected to the 21st Century Network by 2008. Before that happens, it will be necessary to consider how PSTN-specific wholesale regulation would need to migrate to an IP-based network. We would expect that voice-based service providers (who use CPS and WLR) will need to adapt their business models to the changing network and market environment, as would the regulatory regime. It will therefore be appropriate to review the regulation of fixed

wholesale voice markets. If competition in current generation broadband is successful, and if voice over broadband services is providing a significant competitive restraint on voice-specific services, there is a prospect that fixed voice markets will themselves become competitive at least in some areas, without the need for voice-specific regulation. As we discuss above, access regulation such as LLU and DataStream (as adapted to the IP environment), designed to ensure competition in broadband, may be delivering the same result in wholesale voice services. In areas where these kinds of data access product have not been taken up, and perhaps for customers not buying broadband services, we would need to be sure that competition was sufficiently effective and sustainable before withdrawing regulation.

8.30 Many service providers currently rely on regulated wholesale products in voice, in particular CPS and WLR. One important consideration for the assessment of SMP in these wholesale markets would be whether service providers are able to negotiate commercial wholesale arrangements with a range of platform operators – such as BT, cable operators or Altnets using LLU – as a substitute for the current regulated wholesale access products. If there was indeed effective competition in the wholesale market, we might expect to find a range of platform operators who would provide wholesale access to service providers whose activities strengthened their platform relative to their competitors. There would also need to be relatively low barriers to switching by service providers between such wholesale providers. Such opportunities for supply-side substitution would be an important consideration in any market analysis considering the relaxation of regulation in future.

8.31 The fixed voice market is likely to be much more competitive in some locations than in others, and may provide greater choice for some customers (for example those taking broadband services) than others. The regulation that Ofcom puts in place should aim to ensure that all types of consumers, and consumers in all areas, are able to benefit from competition. Therefore CPS and WLR products, perhaps available only in certain areas and/or to certain customers, are likely still to be required. There are a number of options for what such a wholesale product could look like. One possibility is that the evolution of CPS is an IP origination product, with a quality of service suitable for voice. For WLR, the equivalent in an NGN world is likely to be a bitstream access product with quality of service fit for voice.

8.32 **Stage 5 (ongoing monitoring, review by 2008): definition of an inter-platform voice market**. As we discussed above, there is strong evidence of the increasing displacement of fixed services by mobile networks. But for substitution to develop to the level where mobile companies exert competitive pressure on BT's pricing and vice versa, it would be necessary for the relative difference in prices of voice calls on fixed and mobile networks to decline to a much greater degree. The test used to assess whether these services were in the same market would be the standard market definition assessment.

8.33 We will regularly monitor whether this test has been met, and expect to carry out a formal review by 2008. When and if it becomes appropriate to define fixed and mobile voice markets as the same market, we will assess whether one or more suppliers has SMP in these markets. If no SMP were

found either at the retail or wholesale level, no remedies would be appropriate in this market. Through the emergence of a competitive market in access in this way, Ofcom hopes eventually to withdraw completely from voice-specific regulation, other than the generic conditions of entitlement contained in the General Authorisation and any universal service requirements that remain necessary.

Question 9. *Do you agree with Ofcom's proposed approach to deregulation of voice services?* [29]

Business voice services

8.34 BT has suggested that there is a strong case for Ofcom to examine the market for business voice services, where BT considers that the conditions of competition would already allow for significant regulatory withdrawal. The question of the appropriate regulatory regime for business voice services has been extensively considered by Oftel and then Ofcom. We issued a statement on this issue in May 2004[30]. We concluded that BT retains a position of SMP in relation to business voice services and therefore continued regulation is appropriate. On a specific request from BT that it be granted greater freedom to bundle SMP and non-SMP services and to offer global discounts across SMP and non-SMP services, we considered that if BT provided wholesale inputs to its competitors in a similar manner to its own retail operations (we called this 'replicability'), then such deregulation might be appropriate. Clearly replicability relates closely to the concept of equality of access. So if equality of access was applied to key business voice products, then the deregulation requested by BT would be appropriate.

8.35 BT has also asked for greater freedom in relation to price publication requirements, particularly in relation to tender processes and e-auctions. It is important here to distinguish between freedom from process requirements and freedom from requirements not to engage in discriminatory pricing. More flexibility to offer differential tariffs is linked to the achievement of equality of access, already discussed. If all competing companies had access to the same products on the same terms, then it would be possible to take a more relaxed approach to downstream price discrimination in the retail market.

8.36 It may be appropriate to look again at whether price publication requirements impose unnecessary burdens on BT and its corporate customers. In doing so, however, our starting point would be that the underlying problem of detecting anti-competitive pricing remains, and the question would be whether a more effective mechanism could be found to address this concern.

8.37 BT may wish Ofcom to go further and immediately conduct a new market review of the business market, arguing that there is in fact a significant part of the market which is fully competitive, stratified by size of customer and by geography. Ofcom would of course look specifically at the business market

[29] More detailed questions on this issue are listed in Annex H.
[30] *BT's pricing of services for business customers,* Ofcom, May 2004

when conducting the market reviews described in Stages 3 to 5 of the proposals for voice deregulation, discussed above.

Question 10. *Do you agree with Ofcom's proposals for deregulation of business voice services?*

10 a) *Has the voice market for large business become more competitive since Ofcom issued its large business pricing statement, necessitating the conduct of a new market review?*

10 b) *What wholesale inputs should be provided on an equivalent basis before BT should be granted greater freedom in relation to the pricing of voice services to large businesses?*

Other narrowband services

8.38 The evolution to NGNs and the increased competition in current generation broadband will have implications for the regulation of other narrowband markets too.

8.39 At present, narrowband internet services are provided using Number Translation Services (NTS) and Flat-Rate Internet Access Call Origination (FRIACO). FRIACO was designed before broadband was widely available, to enable service providers to offer unmetered internet access products aimed at high users. We propose to review the continuing need for it at the same time as reviewing the first tranche of wholesale markets, discussed above. Though it is important to withdraw regulation rapidly if it has been superceded by market developments or by technology, as long as a significant market for unmetered narrowband services delivered over the PSTN exists, there will be a requirement to maintain the FRIACO regime. Similarly, the NTS regime supports a wide variety of voice telephony services as well as dial-up narrowband internet access. It is being reviewed separately by Ofcom. In September we published proposals to deal with the problems of the regulatory design built into the NTS regime, in order to make it fit better with commercial realities and consumer interests in future.

8.40 It will be important that an entry level, low cost wholesale internet access product is available from BT's 21st Century Network. However, it is not yet clear what such a product would look like, and we would like to explore this in the course of this consultation.

Question 11. *How should regulation of narrowband internet evolve as networks migrate to NGNs, and how will functional, low bandwidth internet access be provided in future?*

Next generation core networks

8.41 As operators migrate their core networks to next generation networks (NGNs), there is an urgent need to develop the regulatory environment that determines the rules for access and interconnection. Because these networks are being defined now, we have the opportunity now to influence the competitive landscape in telecoms for some time to come. Ofcom will

ensure that the regulation of NGNs adheres to the principles of telecoms regulation which we proposed in Chapter 5. In particular, it is important that regulation of NGNs incorporates the principles of promoting competition based upon the deepest levels of infrastructure where it will be effective and sustainable, and of ensuring equality of access to the economic bottlenecks beyond those points. It is also important that regulation does not obstruct timely and efficient investment in these new core networks.

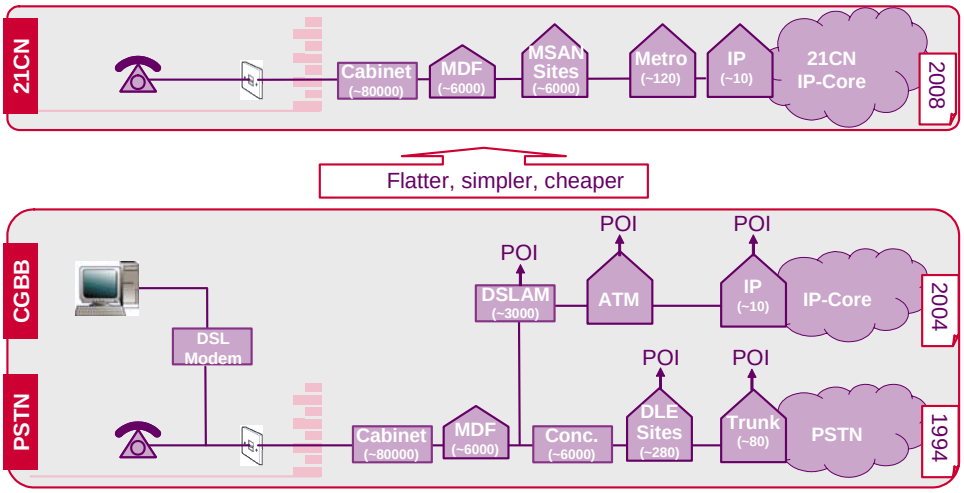
8.42 This issue has been brought into sharp focus by BT's announced plans to deploy its 21st Century Network. We are separately publishing a consultation on the key policy issues involved in access and interconnection to the 21st Century Network which explores these issues in detail. For the purposes of the Telecoms Review, we summarise below the main issues raised. We discuss three issues in particular:

- level of interconnection to next generation networks;
- delivering equality of access in the 21st Century Network; and
- interconnection arrangements.

Levels of interconnection to next generation core networks

8.43 Although in principle the regulatory issues around access to next generation core networks are the same as those for legacy networks, NGNs are flatter in structure – in other words, they have fewer levels of network hierarchy. Figure 19 compares interconnection of the PSTN and NGNs.

Figure 19: Interconnection on next generation networks and legacy networks



Key:

POI	Point of Interconnection	Conc	Concentrator
PSTN	Public Switched Telephone Network	DSLAM	DSL Access Module
CGBB	Current generation broadband	DLE	Digital Local Exchange
21CN	BT's 21st Century Network	MSAN	Multi Service Access Node
MDF	Main distribution frame		

8.44 BT's plans for its next generation of network envisage provision of access to the copper loop (i.e. LLU), and interconnection to the metro nodes.

However, the principle of promoting competition at the deepest level in the network in which competition will be effective and sustainable could imply that there should be interconnection to the MSAN in certain circumstances. Having interconnection only at metro nodes and LLU, and not at MSANs, could reduce significantly the scope for infrastructure investment by some alternative network operators. On the other hand, having multiple forms of regulation in the same geography is inconsistent with our intention to focus regulation on enduring economic bottlenecks only.

Delivering equality of access in the 21st Century Network

8.45 As noted, the advent of the 21st Century Network provides a unique opportunity to build into the system from the outset the equality of access we describe in Chapter 6. However, the detail of how this equality would be achieved is less straightforward. We noted in Chapter 6 the need for the 21st Century Network to include equivalent systems and processes, and earlier in this chapter we pointed out that there could be a fundamental asymmetry in the broadband provisioning processes available to BT and to operators using LLU.

8.46 A linked issue is the degree of control that interconnecting operators will have over service delivery across the 21st Century Network. In general terms, BT will define interfaces which permit a defined degree of access to core network control elements. These could determine, for instance, the extent to which an operator could specify quality of service levels. It will be necessary to ensure that these rules apply in an equivalent fashion to BT's downstream businesses and to those of rival operators. However, there is also an issue of principle about the extent to which these controls effectively confine all innovative activity to BT Wholesale. Some basic ground rules clearly need to be agreed, and it would be unreasonable if there was little scope for service differentiation other than that initiated by BT Wholesale.

8.47 It will also be necessary to identify which of the current regulatory obligations that BT is under to provide service-specific access products needs to be carried over into the 21st Century Network environment. A key question here is the extent to which it is possible to reduce the number of regulatory products required to be provided while still providing sufficiently differentiated inputs to downstream retail markets to provide scope for effective competition.

Interconnection arrangements

8.48 As well as the technical issues around network design and interconnection, it will be necessary for interconnecting operators to agree the associated commercial arrangements. The larger IP-based networks that make up the internet have historically exchanged traffic on a peering basis (i.e. effectively 'bill and keep'). Where charges for data traffic are made, these tend to be either usage-based or capacity-based, though hybrids are becoming increasingly common (such as capacity-based charges up to a specified limit, with additional usage-based charges above that limit). Voice traffic has historically been exchanged using usage-based charging (i.e. pence per minute). Networks exchanging IP voice traffic might adopt any one of these commercial models; peering, usage-based charging, capacity-based charging, or possibly a hybrid model.

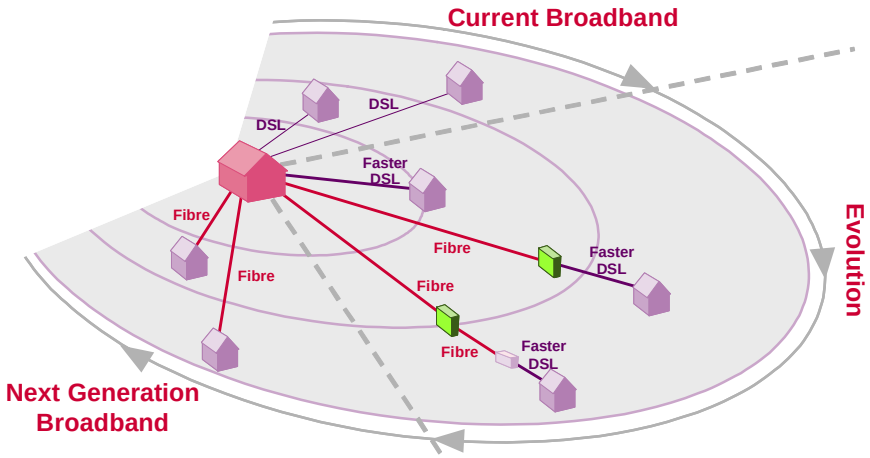
Question 12. *How can the arrangements for access and interconnection to next generation networks best address our proposed regulatory principles?*

Next generation access networks

8.49 We define next generation access networks broadly to be those that go beyond the capabilities of the existing copper, cable and wireless public networks that exist today. They will allow the delivery of much higher bandwidths to consumers, and in consequence the delivery of much richer services. Next generation access networks have not yet been deployed on any scale in the UK, though private networks and dedicated leased lines with similar capabilities are supplied to some high value business customers.

8.50 We understand that operators are likely to take a phased approach to deployment of next generation access networks. This is shown in Figure 20. Initially, operators are likely to deploy improvements to DSL and other current generation technologies which do not require major new network roll-outs. This approach may be restricted by geography, and only available to customers a certain distance from their local exchange. At some point, if operators are to offer increased bandwidths to a reasonable proportion of customers, they will need to roll fibre out beyond the local exchange to the cabinet. Ultimately, fibre may be deployed to the kerb or the premises for some customers.

Figure 20: Upgrade path to next generation access networks



8.51 Some wireless technologies may also be used to provide next generation broadband access. These are likely to use high frequencies, and may use mesh architectures due to the propagation characteristics of these frequencies. Many of these technologies appear very promising, and in Annex Q we summarise the access technologies that we have assessed as part of our analysis. While we will facilitate market entry based on the use of such technologies, we consider that their business cases are too uncertain at present to assume their roll-out when formulating our regulatory strategy.

Definitional problems and issues

8.52 It should be noted that while this definitional approach is sufficient to describe the broad area we are focusing on for the purposes of this discussion, there are some considerable challenges in defining an economic market for next generation broadband access along these lines for regulatory purposes.

8.53 Many of the services which could be provided over a next generation access network would be the same as those which can be provided over the current narrowband and current generation broadband networks. For the purpose of delivering those services, the new network would form part of a broader economic market that also included the legacy networks. But it is likely that there is a set of services which would be delivered only over next generation broadband access networks – for instance, video entertainment and computer games – because they require higher bandwidths of the kind that only a next generation access network could provide. To this extent a narrower market would exist (a logical distinction similar to that which we apply to existing broadband and narrowband services). While a single investment would be made to upgrade the network, it is possible in principle for different regulatory approaches to apply to different services offered over that network.

8.54 Some businesses already receive services over fibre connections. A policy aimed at new investment in the mass market deployment of next generation access would not be intended to apply retrospectively to fibre investments already made providing, for example, leased lines to business customers. On the other hand, many SMEs who currently rely on business services provided over the public network, such as current generation broadband or ISDN, might purchase new services offered over an upgraded public fibre network.

8.55 These considerations suggest that, even if there is a case for applying a new regulatory approach to next generation access networks which is materially different from that which we apply to existing networks and services, the definitional issues will need very careful examination. We note that in the United States, the Federal Communications Commission (FCC) has faced similar challenges in establishing the boundaries of its forbearance policy in relation to access network upgrades. We will return to these implementation issues in Phase 3.

Prospects for roll-out

8.56 In some countries, fibre in the local loop has been or is being deployed extensively. But these countries all have different demographic, competitive or political environments to the UK. For example, the roll-outs of fibre in some countries are the result of public subsidy; other countries have ubiquitous cable networks competing with the PSTN and driving new investment; and for others investment in new fibre networks is the path to entry to a market which has previously had little or no competing infrastructure. We discuss regulation and the roll-out of infrastructure in other countries in Annex O.

8.57 Therefore the extent that these experiences in other countries inform the case for fibre deployment in the local loop in the UK is limited. Though a business case may exist for additional fibre roll-out to business customers in some areas of the UK, the case for widespread fibre deployment in the local access network for residential customers and SMEs is uncertain in the near term. Network operators in the UK have told us that they do not see a case for such a roll-out. The lack of appetite for new fibre deployments is reflected in BT's 21st Century Network announcement which makes clear that fibre will, for the foreseeable future, only be considered for green field building developments. Clearly it will be very important for Ofcom to understand why the market appears to be giving such strong signals about a lack of interest in a new technology which purportedly holds considerable promise for innovation to the benefit of consumers.

8.58 A very high proportion of the roll-out costs of fibre are in the civil infrastructure. Measures taken to improve the civil infrastructure costs, such as use of existing ducting, ducting being laid for new housing, and use of cabinets and other local loop plant ('external plant'), considerably improve the business case. BT has an advantage over many other operators in this regard in that it has an existing duct network, at least in some parts of the network and in some areas. These duct assets can be re-used for fibre deployment, so the cost to BT (and possibly cable operators) of building a new fibre network will be lower than that faced by a new entrant building a fibre network, including ducts, from scratch.

Ofcom's policy approach

8.59 Given the lack of apparent market interest in deployment, it could be considered premature for Ofcom even to start to consider the issues that would arise from next generation access. On the other hand a clear policy statement now could at least reduce some of the regulatory uncertainty around such investments.

8.60 We believe that the deployment of next generation access represents an opportunity for a new competitive structure to emerge which would avoid the regulatory battles of the last twenty years. Next generation access networks also have a slightly different regulatory imperative to today's infrastructure. Because they are not yet in place to any significant degree, there is a strong imperative that regulation does not disincentivise their timely and efficient deployment. As we noted in Chapter 4, there is widespread acceptance among our stakeholders that widely-available broadband is critical to economic competitiveness, and many consider that this effect will become more pronounced with the advent of the more powerful broadband applications which can only be supplied over next generation broadband access networks. This suggests that there is a strong citizen interest in seeing these networks deployed as soon as possible. But this needs to be carefully balanced against our duty to safeguard the interests of consumers, where appropriate by promoting effective competition.

8.61 These are clearly conflicting factors. In seeking to achieve a balance, Ofcom believes we could adopt several broad alternative approaches to regulating next generation access networks. They are:

- A. equality of access from the outset with standard rate of return;
- B. equality of access from the outset with risk-adjusted rate of return;
- C. time-limited forbearance; and
- D. time-limited forbearance combined with contestability.

8.62 Each or any of these models could possibly be combined with a structurally separated vehicle for fibre investments. We discuss this possibility at the end of this section.

Equality of access options (A and B)

8.63 Option A is similar to the current regime for local access but with imposition of equivalence of input in line with our proposals on equivalence for new regulated products. The major issue with this approach is that it may disincentivise efficient investment. Option B differs from option A in that it can allow a rate of return that is consistent with the risk profile for such investments rather than the average cost of capital for BT as a whole. Adjusting the allowable rate of return would allow more efficient investments to be made and thus better meet consumer and citizen needs. While both these options have the benefit of ensuring fair downstream competition and providing certainty for current generation broadband investors they both present the problem of imposing a regulatory burden on a developing market. Even if BT were permitted to earn higher returns for its risky investments, a lack of competition in making the investment might reduce its urgency to invest. In seeking to apply a risk-adjusted rate of return, the definitional problems already referred to would be particularly significant.

Time-limited forbearance (option C)

8.64 In principle, the simplest way to ensure that regulation did not disincentivise efficient investment would be to forbear from regulation altogether for a period of, say, five years. Thereafter regulation would, if appropriate, be applied requiring wholesale access to be offered to other providers based on equivalence of input. BT has in fact urged us to adopt such a policy. However, given the leverage that BT can bring to bear in terms of its existing infrastructure of ducts and other external plant such forbearance would clearly carry a significant risk of BT accumulating a position of market power in this new market. This option also presents problems for downstream competition during the period of forbearance and, if equivalence of input cannot be quickly and effectively delivered, afterwards as well. Any forebearance would of course have to be compatible with the EU regulatory framework.

Time-limited forbearance with contestability (option D)

8.65 Option D would be similar to option C but in this case Ofcom would make forbearance contingent on the investment being contestable to a range of operators besides BT. This approach assumes that, by the time next generation access is being meaningfully deployed, the competitive landscape will have improved as a result of further deep deployment of infrastructure by LLU-based operators (though of course this cannot be

guaranteed). Such operators would have developed their networks as far as the edge of BT's access network. Even given such a starting point however, to achieve contestability it might be necessary to secure open access to the civil infrastructure, principally BT's ducts. This is because BT would otherwise have a significant cost advantage over any rival network. Combined with time-limited forbearance, this would have the advantage of providing a further incentive for all operators to make the investment quickly: if they were not the first to invest, they would be likely to lose a significant first-mover advantage to a rival.

8.66 We believe that it is right to look again at requiring BT to provide open access to its civil infrastructure for this reason. However, when this issue has been looked at in the past, it has been found to present very significant practical problems. We recognise that even with BT's active co-operation, these may be difficult to solve. We explore the options in more detail in Annex I. Again, it is worth noting that any forebearance would need to be consistent with the EU regulatory framework.

Structural options

8.67 One way to avoid some of the problems associated with many of the options would be a structurally separate entity providing next generation local access. Such an entity would still need to be heavily regulated, but the problems of a monopoly local access provider which was vertically integrated with core network and retail operations would be avoided. We suggest that there are five ways that such an entity could come about, each with different ownership structures and sources of assets. They are:

- non-telco or public sector ventures;
- use of alternative civil infrastructures;
- an industry joint venture;
- divestment of dark fibre and duct assets by BT; and
- different structures for new-build housing.

8.68 To be successful, many of these options would require BT to be involved. We would therefore like to explore how such structural options might work, and how they could be made attractive to BT. We briefly discuss each of the options below.

8.69 **Non-telco or public sector ventures**. The Communications Act allows non-telcos, including local authorities and their appointed agents, to build and own their own telecoms infrastructure. The Broadband Stakeholders' Group has made the case for a new type of company building open access ducting for the fibre networks of the future. Such an approach has been successful in other EU countries.

8.70 One problem with this approach in the UK is that there seems to be little appetite at present within the industry to make use of such a facility. This could be because of the cost-advantage that incumbent operators have due to the potential to re-use their existing civil infrastructure for next generation broadband services. It is possible that potential investors have calculated

that building new networks from scratch will be more expensive than leveraging existing civil infrastructure.

8.71 **Use of alternative civil infrastructures**. It may be possible to use other civil infrastructure already in the ground, for instance gas pipes or sewers, as ducting for next generation broadband access. At present we are sceptical that these networks are sufficiently extensive, low cost or fit-for-purpose to provide a ready-made alternative to existing telecoms infrastructure. However, we would welcome views on this point.

8.72 **Industry joint venture.** Under this option, BT and other telcos would invest in a joint venture entity. This entity would secure cost-based access to BT's and the other investors' ducts, roll-out fibre and make that dark fibre available to all of its investors. One alternative would be the creation of regional entities on these lines, opening up the prospect of yardstick competition or efficiency benchmarking between them.

8.73 **Divestment of dark fibre and duct assets by BT**. A further option would be that BT divested its ducts and dark fibre into a separate entity, which then made these available to any wholesale customer. Were this option attractive to BT, the process of divestment would be complex. However, in a way this is the most straightforward option as it requires less co-ordination between multiple players.

8.74 **Different structures for new-build housing.** A final option would be to treat new-build housing differently. One possibility would be to emulate the situation in the gas and electricity industries, where open access infrastructure providers tender to housing developers to build connections to new buildings. These providers would charge a regulated price to any telecoms service provider who wished to use their local access infrastructure, on non-discriminatory terms.

Question 13.	*What should Ofcom's regulatory approach be to next generation access networks?*
13 a)	*In what circumstances should Ofcom forbear from regulating next generation access?*
13 b)	*How important is it that the investment be made contestable; is this achievable?*
13 c)	*How should Ofcom regulate next generation access if market power were to emerge in this market?*
13 d)	*How might structural options help to eliminate the problems of monopoly access assets being owned by vertically integrated operators?*

Promoting competition in business markets

8.75 As noted in Chapter 4, a wide range of access products are purchased by business consumers. These include private circuits as well as products which use the public network. There will continue to be a need for a regulated set of private circuit-type products for the foreseeable future, since these underpin the competitive provision of services such as VPNs

and managed data services on which the business market relies. Some of these products are also used by other telecoms operators, for instance as backhaul circuits linking access networks back to the core network.

8.76 Some of the current product set is likely to be replaced by BT as part of the migration to the 21st Century Network. Currently, BT is required to provide two forms of wholesale cost-based transmission to other carriers: Partial Private Circuits (PPCs) which are based primarily on Synchronous Digital Hierarchy (SDH) technology; and Ethernet products such as Backhaul Extension Service (BES). There are broadly three ways in which these services might evolve:

- BT might be required to continue to provide dedicated transmission capacity, but with a gradual migration to new transmission technologies, notably Ethernet. This would require a significant re-design of the PPC product, due to major differences between SDH and Ethernet technology;
- BT might be required to provide virtual transmission capacity, similar in character to the current ATM-based DataStream service, but probably based on IP/MPLS; or
- BT might be required to provide access to the underlying physical medium, by providing access to dark fibre. Existing fibre might be treated in a different manner to new fibre, since (as discussed above) an obligation to deploy new fibre and make it available at cost-based prices might disincentivise new investment. Any regulatory intervention might be restricted to those geographic areas where there was no alternative supply of dark fibre.

8.77 For smaller business sites, access has traditionally been provided over public networks; for example, analogue PSTN lines (single or multiple) and ISDN. The availability of competing infrastructure tends to be limited, so the promotion of competition tends to rely on the availability of wholesale access from BT, principally in the form of Wholesale Line Rental. However, this may change as an increasing range of services tailored to the needs of business users are provided over broadband.

8.78 Our proposed principle that regulation should recognise variances in the conditions of competition between geographies is relevant here. The kind of regulated access product required to be provided in the future by BT could vary by geography, depending on the level of competitive activity in a particular area and the viability of the solution proposed. This issue is explored in more detail in Annex F.

8.79 A much wider range of voice services are sold into the business market than into the residential market. This includes such services as Centrex and Voice VPNs. These are likely to evolve over the next few years – for example, IP VPNs will increasingly take the place of dedicated voice VPNs. Ofcom expects that, given a suitable range of wholesale access services supplied by BT, competing operators should be able to replicate the full range of business voice services provided by BT without the need for additional voice-specific regulation.

8.80 There are, however, some concerns in relation to the migration process from legacy voice networks to next generation networks. Migration of an individual line often raises complex process issues. However, these are trivial compared to the process issues raised by the migration of a corporate VPN. If the complexity of this migration process prevents corporate customers switching suppliers, then the potential competition benefits associated with the migration to next generation core networks are unlikely to be delivered.

Question 14. *What set of wholesale access services should BT be required to provide in order to promote competition in the business market?*

Question 15. *What can be done to facilitate the migration of complex corporate services (e.g. VPNs) between suppliers?*

Mobile networks

8.81 We noted in Chapter 5 that policies designed to promote infrastructure competition had been much more successful in mobile than in fixed networks. Oftel did not find SMP in mobile call origination when it conducted its market review, and mobile is therefore subject to much less economic regulation than many fixed markets.

8.82 Many of the mobile operators argued in their responses to Phase 1 that the UK mobile market is extremely competitive, and not merely ”prospectively one of the most competitive in Europe”, as we stated in our Phase 1 document. Some mobile companies argued that Ofcom should go further and commence the process, via negotiation with the European Commission, of dismantling the remaining mechanisms for regulating the mobile sector (at least with the single exception of regulation of mobile termination). We believe this goes too far. The mobile market remains highly concentrated in comparison with other industry sectors, and we note many of the comments we received from analysts, investors and others that further consolidation is quite possible. It is appropriate that we retain the ability to conduct future market reviews and by doing so, to invoke remedies to regulate market power across the mobile market (including in origination), should it emerge beyond the time horizon of the existing market reviews, or should there be a significant change in market circumstances.

8.83 The main area where enduring economic regulation does remain in mobile is in call termination. Because of the Calling Party Pays (CPP) arrangements that exist in the UK, terminating operators effectively have a monopoly over provision of call termination to their subscribers. In the absence of price controls, termination rates would be set inefficiently high.

8.84 As a result of these characteristics, regulatory intervention under CPP has been extensive; relying on cost-based price controls. Because the need for intervention is independent of the number of firms terminating calls and the level of competition in call origination, it is not a transient but a permanent feature. It is recognised that this type of regulatory remedy is intrusive, and it relies on the regulator making complex cost estimations partly on the basis of information provided by network operators. But given the current call termination structures, i.e. CPP, there is little alternative.

8.85 If these problems were to persist into next generation mobile networks, it could be appropriate to look for arrangements which could alleviate the market power that network operators have over call termination, and so limit the need for regulatory intervention. Ofcom is keen to explore any such proposals that the industry may have. In principle, there are other structures for call termination, such as Bill and Keep, and Receiving Party Pays (RPP) which could potentially alleviate the market power concerns that currently exist on call termination.

8.86 But there are reasons to believe that the regulatory problems around call termination may not persist as next generation mobile networks are developed. Interconnection between IP-based mobile networks could offer an opportunity for market-based solutions to the call termination problem. As we discuss above, IP-based networks may not charge interconnection fees on a pence-per-minute basis. Even if CPP arrangements persist, peering or other arrangements that are in place for data may be able to be used for voice, albeit at a lower quality of service. This could have the effect of limiting the interconnection price that can be charged for voice termination. In addition, call termination charges may in future be constrained by the retail price for IP data transport to and from a mobile phone. If termination charges were very high but the retail price of IP data transfer was low, there would be an arbitrage opportunity for service providers to terminate calls to mobiles. This could provide some constraint on mobile operators' market power in call termination.

Question 16. *Are any alternative structures for call termination appropriate? Could evolution to IP interconnection introduce market mechanisms that make intrusive regulation unnecessary?*

9. Exercising effective consumer choice

9.1 The principles proposed in Chapter 5 suggest that Ofcom should target regulation at enduring economic bottlenecks; and if it is successful in securing equality of access at those levels, and if such access is successful in promoting competition, it should be possible to withdraw regulation elsewhere. In many cases, this means regulating at a particular level in the wholesale market, and withdrawing from regulation of the retail market. Consumers would be protected from outcomes such as excessive pricing and poor service through the normal operation of competition, backed up by competition law. For example, our proposals for the voice market follow this approach.

9.2 However, for the market to function as intended, action may be required to ensure that consumers can be effective at disciplining suppliers, by making informed choices between alternative suppliers, and switching readily and easily between them. Yet as we discussed in Chapter 4, many consumers find it hard to engage in the competitive process, because they find it difficult to compare suppliers, and because many are disinclined to switch between suppliers. We noted that this problem varied by market and by type of consumer. In this section, we discuss the options for making it easier for consumers to search for the right supplier, and then to switch to that supplier.

9.3 There are strong theoretical arguments why it might be appropriate for Ofcom to intervene in these areas. As consumers' search costs and switching costs are reduced, they benefit more from competition. Buying telecoms services or switching providers presents several practical challenges to consumers that are not present in many non-telecoms markets. For example, there are complex bundles of services, there are quantity discounts and non-linear pricing, there are new products in the market place (such as broadband) with complicated technical parameters, and consumers often have little means of knowing the price of the particular call they wish to make. Also, for consumers to switch providers seamlessly requires providers to co-operate in ways that are not required in other markets.

9.4 As part of our research, we have looked at the approaches of other sector regulators, such as the Financial Services Authority (FSA) and Energywatch. In general, these regulators take a more direct approach than Ofcom to ensure that consumers find it easy to compare suppliers and to switch between them.

Consumer Information Principles

9.5 Informed consumers can make sense of the options available to them in increasingly competitive markets and can seek redress more effectively when things go wrong. While competition and new technologies increase choice, they may also lead to confusion.

9.6 Ofcom fully recognises the importance of identifying information gaps which can lead to consumer detriment. Whenever considering policy issues, Ofcom will also bear in mind the consumer dimension and more particularly whether timely, relevant, accessible and reliable information is required.

9.7 In taking this issue forward, Ofcom needs to have particular regard to its statutory duties. Furthering the interests of consumers, where appropriate by promoting competition, we believe requires action on the demand side – empowering customers to make effective choices – as well as on the supply side. At the same time, we need to have regard to our other duties and obligations: what we do in this area needs to be transparent, accountable, proportionate and targeted; we need to consider whether a self-regulatory approach is already addressing, or could address the problem; and where appropriate, we need to conduct a thorough regulatory impact assessment.

9.8 Ofcom will therefore apply some high-level principles in relation to consumer information issues. These principles extend beyond the current focus on consumer information issues in relation to telecoms markets, and encompass consumer information initiatives across our entire range of activities. They are set out in Figure 21.

Figure 21: Ofcom's principles on consumer information

Where Ofcom considers that there is clear evidence that people need objective and reliable information on communications issues falling within its remit, Ofcom will:

- *encourage markets to provide timely, objective and reliable information, with the possibility of regulatory intervention where appropriate;*
- *provide people with timely, objective and reliable information where it is not appropriate to rely upon the market to provide such information and:*
  - *the possible harm is serious, in terms of both numbers of consumers affected and the nature of the harm, particularly where:*
    - *there is a degree of urgency;*
    - *consumers are at risk of being deliberately misled or 'scammed'; or*
    - *vulnerable consumers, e.g. the disabled, are at particular risk of acute detriment; or*
  - *Ofcom or the Government has imposed a change upon the market;*
- *communicate in plain English, using language understood by all;*
- *use the most appropriate communications channel – whether this is online, on air or in print – for the relevant audience;*
- *take into account the interests of people with visual and hearing impairments and other disabilities;*
- *consider the needs of people who do not speak English as a first language;*
- *consult relevant stakeholders where appropriate; and*
- *review its information regularly to assess its impact.*

Ofcom will also consider whether it has a statutory duty to provide or ensure the provision of information or whether there are operational benefits to Ofcom in providing information itself.

9.9 In deciding whether information should be provided to consumers, and if so by whom, Ofcom will work closely with bodies such as ICSTIS, Otelo and CISAS; these are examples of the 'relevant stakeholders' referred to in the above principles. In addition, there is a very close relationship between media literacy (consumers being comfortable using new media such as the internet) and information for consumers. Ofcom has a duty to promote media literacy and will apply the above principles in determining its input in this area.

9.10 In telecoms, we have looked at options to reduce consumers' search costs and their switching costs. That this is an area which merits further attention is clear from the consumer research conducted by Ofcom to date, which we are publishing in Annex M. The research highlights that the level of switching in fixed telecommunications is lower than levels of switching in, for instance, the gas and electricity markets. It also highlights that many

consumers find it difficult to compare the information which they are given by suppliers. Moreover, many are unaware of the level of choice actually available to them. The nature and severity of these problems vary by market, and this will need to be reflected in Ofcom's regulatory approach.

9.11 In line with our desire to be an evidence-based regulator, before taking a final view on our approach we will examine the nature and scale of the problem being experienced by consumers, in particular through some further targeted research that we are conducting. This research will look at the level of detriment experienced by consumers as a result of difficulties encountered in searching and switching, and whether particular groups of consumers are disproportionately affected. At this stage we can nevertheless identify some broad approaches that Ofcom could take.

9.12 Our current policy reflects the existing requirements of the Universal Service Directive (USD). Article 21 of the USD requires that Member States:

" …ensure that transparent and up-to-date information on applicable prices and tariffs, and on standard terms and conditions, in respect of access to and use of publicly available telephone services is available to end-users and consumers."

In addition, Ofcom is required to:

"…encourage the provision of information to enable end-users, as far as appropriate, and consumers to make an independent evaluation of the cost of alternative usage patterns, by means of for instance, interactive guides."

9.13 Options that go beyond these requirements could only be taken forward following a review of the Universal Service Directive itself and consequent changes to the provisions, or as self-regulatory initiatives by the industry itself. The USD is due to be reviewed by the European Commission in 2005, so if Ofcom considered more specific measures were necessary there would be an opportunity to raise this as part of that review.

Options to reduce search costs

9.14 We have looked at six options to make it easier for consumers to make comparisons between suppliers:

- **leave to the market**. It may be argued that the solutions to this problem should rest entirely with the market, and that Ofcom should avoid getting involved in this issue at all. We believe that complete deregulation is inappropriate. It would be insufficient to satisfy the requirements of the Universal Service Directive. We do not believe at present that the market, left entirely to its own devices, will provide enough information in a sufficiently comparable format to facilitate consumers searching out alternative suppliers and switching between them;
- **Ofcom to provide comparable price information**. This approach would be consistent with that adopted by other sector regulators. But it would be resource-intensive for Ofcom, probably more so than in other sectors because of the number of suppliers and wide range of packages and tariffs. In addition, our research showed the real problem is in

consumers making comparisons, not accessing information. Just publishing tariff information would therefore be unlikely to solve the problem. Ofcom could go further and build an on-line comparison tool. Previous experience, however, suggests that this may not work very well in practice unless it offers consumers the option of making comparisons based on their actual bill records. This is an area where third parties are already providing similar services, and Ofcom believes this service can be offered more creatively and at lower cost by such third parties than by Ofcom itself;

- **promote provision of basic information and the role of intermediaries**. This option would include initiatives such as an enhancement of the current PASS scheme, which accredits service comparison websites (currently only uSwitch.com) to provide on-line price comparisons. We believe that there is scope to enhance this approach considerably, for example by initiatives to extend the scope of the services covered and address the needs of those consumers who do not have internet access. However, it will be important to ensure that service providers themselves co-operate with such an approach by providing information in a timely fashion and a comparable format. We have restricted scope at present to compel such co-operation, though this could change following review of the USD;
- **encourage a responsible approach to service comparisons in advertising**. Ofcom already works closely with the Advertising Standards Authority (ASA) on a range of issues, but we could do more work with the ASA to develop detailed guidelines governing the kinds of comparisons that could be made in advertising telecoms services. Over the last few years there have been many complaints by operators about each others' comparative advertising, and such an approach might assist the ASA to reduce its workload and provide greater certainty to the market;
- **restricting the range of tariff packages and structures in the market**. Although it would go well beyond the existing Universal Service Directive requirements, Ofcom could in principle use the opportunity afforded by the Commission's review of that Directive to argue for changes which would allow us to follow the initiative of the Sandler Report in financial services. This would involve restricting the kinds of services and tariffs that may be offered. This would certainly make comparisons much easier. However, we believe that the costs in terms of reduced choice and stifled innovation in the telecoms market would be very considerable; and
- **bill formats.** There may be some things that service providers could do at relatively low cost to make their bills easier to understand and to facilitate easier comparisons – for example, by using plain English rather than industry jargon. This goes beyond the scope of the USD, and ideally this would be something which service providers would agree a joint approach on themselves, without the need for regulatory intervention.

Options to reduce switching costs

9.15 In addition, we have looked at four options that would make it easier for consumers to switch between suppliers:

- **regulate retail switching costs**. This would be a continuation of the approach taken by Oftel and adopted by Ofcom of ensuring that excessive charges for switching processes such as number portability do not deter consumers from switching supplier. One option would be to strengthen this approach, so that no switching costs could be passed on to the consumer at all. This would require a change to the USD. It could also cause an inefficiently high level of switching in relation to some products. It would appear more proportionate to continue as now to work with the industry to ensure that switching processes are as efficient (and hence low cost) as possible;
- **positively encouraging switching**. Ofcom could do more to promote switching suppliers, advising consumers to shop around and switch in order to get the benefits of competition. This could be backed up by a range of measures to educate consumers on the switching process, such as using the media, booklets and Ofcom's website;
- **encouraging migration between tariff plans**. Ofcom could require suppliers to offer a service whereby consumers can find out if they are on the right tariff with that supplier, or proactively to inform consumers of cheaper tariffs, or even to change the tariff that consumers are on. Some suppliers already do some of these. Regulation in this area would be intrusive, however, and would be beyond the scope of the current USD. Of course, encouraging such migration would not encourage switching between operators – quite the opposite. But it would address directly the concern that some consumers suffer from being on what could be the wrong tariff for their particular needs. Ofcom believes that, if many suppliers began to offer these kinds of schemes voluntarily, there would be no justification for intervention; and
- **encouraging providers to reduce complexity**. The ability for consumers to switch providers easily is often dictated by the processes that service providers use when customers switch between them. In some cases, these could be simplified to ease the complexity that consumers face. One good example of this is the voluntary code of practice for migrations to broadband that broadband service providers developed to ease the transaction costs of switching. However, care would need to be taken not to compromise consumer protection measures that have been built into the switching process.

Question 17. *What approaches should Ofcom adopt to reducing search and switching costs in telecoms?*

10. Universal service arrangements

10.1 Universal service regulation provides a basic safety net of services that are available to all citizens at affordable prices. The scope of the universal service obligations that can be applied in the UK is established by the Universal Services Directive (USD). In line with the requirements of that Directive, the Secretary of State for Trade and Industry sets out in an Order the specific universal service requirements for Ofcom to implement.

10.2 The scope and delivery of USOs has changed only slightly since BT was privatised in 1984. The current USO falls upon BT and Kingston Communications in Hull. They are required to provide a range of services including:

- a connection to the fixed telephone network, which includes functional internet access (a change since 1984), at a uniform price following a reasonable request;
- at least one scheme for consumers with special social needs who have difficulty affording telephone services (the Light User Scheme); and
- uniformly-priced public call box services.

10.3 In addition, BT must provide a relay service for textphone users and supply and maintain directories and databases for the provision of directory services. BT and Kingston are responsible not only for providing these services, but also for funding their provision. Any net cost of the USO is therefore met by BT and Kingston and funded by cross-subsidisation from other activities. Oftel considered that funding these services did not provide an unfair burden on BT or Kingston.

10.4 In principle, the future evolution of the telecoms sector could imply that these arrangements might need to change for two reasons:

- increasing competition could mean that the existing arrangements for provision and funding of universal services are no longer feasible; and
- changes in technology and consumer demand could mean that the scope of universal services should change.

10.5 We discuss these issues in detail in Annex K, and we summarise this discussion in this chapter.

Provision and funding of universal service arrangements

10.6 Increasing competition in telecoms complicates the issue of funding the USO. BT and Kingston have historically funded any net cost of providing universal services from profits they make on higher margin services. As competitors enter the market, these are often the services that they target first. For example, international calls were historically very profitable, and competition developed very rapidly in this market.

10.7 As competition continues to erode high margins across a widening set of products, at some point providing the USO may become an unfair burden on BT and on Kingston. At that point it would be appropriate to consider alternative mechanisms for funding and allocating the USO. At present, under the provisions of the Communications Act 2003, if Ofcom considers that compliance with universal service conditions imposes an unfair burden on a universal service provider, it may determine that contributions are to be made by other communications providers to meet that burden. Going forward, Ofcom believes that the more effective competition in the telecoms market becomes, the faster some kind of universal service fund will become necessary. In principle, such a fund could be implemented through several means, in particular:

- a direct levy on all consumers of certain communications services (for example, a fixed amount that appears directly on the bill);
- an indirect levy on consumers via a levy on communications providers and services (such a model is used in the USA and France) and effectively the process envisaged under the Communications Act; or
- direct government funding.

10.8 We have not considered the exact details of such a fund. However, we note that direct government taxation is likely to be one of the most difficult to implement. A direct levy on all consumers that appears on their telephone bill could create distortionary arbitrage at the margins of what is defined as a communications service. In addition, both of these routes would probably require changes to the legislation.

10.9 Once a fund has been established, we believe that it would be appropriate to consider whether other carriers, as well as BT and Kingston, might be able to deliver universal services, at least in some areas. One possibility would be to auction off the right to deliver the universal service obligation, on the basis of the level of subsidy suppliers required for its provision.

Question 18. *What should be the arrangements for funding the USO in future?*

Question 19. *How could competition for the delivery of the USO be organised in future?*

Scope of universal service arrangements

10.10 Universal service obligations can be justified on the basis that they promote economic efficiency by reflecting network externalities, or on equity grounds in that they ensure that desirable social policy goals are met. Both current USOs, and the demands for the extension of USO to new areas such as broadband, can be analysed in this way. Overall we believe the current range of USOs imposed in the UK can be rationally justified on these criteria.

10.11 The scope to change universal services is constrained in the medium term. The Secretary of State for Trade and Industry, not Ofcom, decides their scope and is in turn working with the framework of the USD. The USD

requires that extension of the scope of universal service will only be permissible if the extension does not disproportionately increase the financial burden on service providers. Nonetheless, we believe that it may be appropriate for the Government and Commission to consider a number of reasons why the scope of universal services might need to change as they begin the planned review of current USOs in 2005. These are:

- **use of mobile**. Mobile may be able to meet many of the requirements of the USO, and it may be a much cheaper technology to deliver services to some remote locations which are within mobile coverage. It may be appropriate to make the USO service-specific rather than technology-specific (it currently specifies a fixed connection). This does not mean that a separate mobile USO should be imposed alongside the obligation to provide a fixed service, but that a universal service obligation defined in terms of access to voice services could be delivered via a mobile connection; and
- **broadband obligations**. Ofcom believes that the case for extending the universal service obligation to broadband is not currently strong either on the basis of economic efficiency, or on the basis of equity. It is simply too early in the development of the market for the necessary conditions to be met. We note that the combination of BT's further roll-out of DSL and its adoption of extended reach DSL mean that BT claims that DSL will be available to 99.4 per cent of the population by mid 2005. The very limited remaining shortfall may best be addressed through public sector infrastructure schemes.

Question 20. *Should mobile technologies be used to help address the existing USO?*

Annex A

Ofcom's consultation principles

Ofcom has published the following seven principles that it will apply for each written consultation:

Before the consultation

1. Where possible, we will hold informal talks with people and organisations before announcing a major consultation to find out whether we are thinking in the right direction. If we do not have enough time to do this, we will hold an open meeting to explain our proposals shortly after announcing the consultation.

During the consultation

2. We will be clear about who we are consulting, why, on what questions and for how long.

3. We will make the consultation document as short and simple as possible, with a summary of no more than two pages. We will try to make it as easy as possible to give us a written response. If the consultation is complicated, we may provide a shortened version for smaller organisations or individuals who would otherwise be unable to spare the time to share their views.

4. We will normally allow ten weeks for responses, other than on dispute resolution.

5. There will be a person within Ofcom who will be in charge of making sure we follow our own guidelines and reach out to the largest number of people and organisations interested in the outcome of our decisions. This individual (who we call the Consultation Champion) will also be the main person to contact with views on the way we run our consultations.

6. If we are not able to follow one of these principles, we will explain why. This may be because a particular issue is urgent. If we need to reduce the amount of time we have set aside for a consultation, we will give those concerned prior warning that this is a 'red flag' consultation which needs their urgent attention.

After the consultation

7. We will look at each response carefully and with an open mind. We will give reasons for our decisions and will give an account of how the views of those concerned helped shape those decisions.

*

In view of the complexity and range of issues considered in this consultation document, the executive summary is longer than two pages. Shortly into the

consultation period, we will publish a shortened version of the document for smaller organisations or individuals who would otherwise be unable to spare the time to share their views.

As the consultation period spans Christmas, we have allowed 11 weeks for responses.

Annex B

List of questions

1. Do you agree with Ofcom's proposed principles for regulation of telecoms markets?

1 a) What regulatory role should Ofcom play in the wider telecoms value chain?

1 b) How should Ofcom reflect differences in competitive characteristics in different geographic areas?

1c) What factors need to be taken into account when considering the scope of demand and supply-side substitution in telecoms markets on a geographical basis?

1d) To what extent would it be appropriate in the future to take into account differences in competitive conditions in different areas through (i) the aggregation of similar geographic areas or (ii) through different remedies?

1e) Would you support a requirement to provide Ofcom with data on particular products on a geographic basis as part of the regular reporting requirements? What is the correct level of disaggregation?

2. Where and to what extent should Ofcom rely on *ex post* competition law rather than *ex ante* regulatory conditions?

3. In what circumstances would it be appropriate for Ofcom to make a reference under Section 131 of the Enterprise Act?

4. Should Ofcom adopt a broad approach of focusing regulation on enduring economic bottlenecks while tackling the problem of inequality of access head-on?

5. How can real equality of access be achieved at the product level?

5 a) Do you agree with Ofcom's definitions of the various forms of equivalence?

5 b) Do you agree that equivalence of inputs can deliver more effective equality than application of equivalence of outcomes?

5 c) Do you agree with the principles proposed on where equivalence should be applied and the specific suggestions for individual products?

5 d) How do you suggest the principle of equality is achieved for 'associated products' that BT does not depend on (such as migration products)?

6. What behavioural changes by BT do you believe would be necessary to achieve real equality of access?

7. How should Ofcom reflect the competing considerations of efficient investment and consumer protection in determining the regulated returns that BT may earn from its network?

8. Do you agree with Ofcom's proposed approach to current generation broadband?

8 a) What should Ofcom's approach be to naked DSL?

8 b) Should there be different regulated wholesale products for current generation broadband in different locations?

8 c) How should the potential lack of equivalence faced by LLU operators in a 21st Century network environment be addressed?

9. Do you agree with Ofcom's proposed approach to deregulation of voice services?

9 a) Do you agree that Ofcom should review regulation of retail voice markets in 2005?

9 b) Do you agree with Ofcom's proposals for deregulating call conveyance markets and wholesale IDD?

9 c) When would it be appropriate to remove the requirement on BT to provide indirect access?

9 d) How should PSTN-specific regulation evolve under NGNs? What should next generation CPS and WLR products look like?

9 e) What are the prospects for increased competition for voice services provided using broadband access products (such as LLU and the evolution of DataStream)? What conditions and transitional arrangements would need to be in place to allow service providers to secure access on the basis of commercial terms rather than PSTN-specific regulated products?

9 f) How should Ofcom ensure competition in areas where alternative platforms were not in place?

9 g) When do you expect fixed-mobile substitution to result in a single economic market for voice call origination?

10. Do you agree with Ofcom's proposals for deregulation of business voice services?

10 a) Has the voice market for large business become more competitive since Ofcom issued its large business pricing statement, necessitating the conduct of a new market review?

10 b) What wholesale inputs should be provided on an equivalent basis before BT should be granted greater freedom in relation to the pricing of voice services to large businesses?

11. How should regulation of narrowband internet evolve as networks migrate to NGNs, and how will functional, low bandwidth internet access be provided in future?

12. How can the arrangements for access and interconnection to next generation networks best address our proposed regulatory principles?

13. What should Ofcom's regulatory approach be to next generation access networks?

13 a) In what circumstances should Ofcom forbear from regulating next generation access?

13 b) How important is it that the investment be made contestable; is this achievable?

13 c) How should Ofcom regulate next generation access if market power were to emerge in this market?

13 d) How might structural options help to eliminate the problems of monopoly access assets being owned by vertically integrated operators?

14. What set of wholesale access services should BT be required to provide in order to promote competition in the business market?

15. What can be done to facilitate the migration of complex corporate services (e.g. VPNs) between suppliers?

16. Are any alternative structures for call termination appropriate? Could evolution to IP interconnection introduce market mechanisms that make intrusive regulation unnecessary?

17. What approaches should Ofcom adopt to reducing search and switching costs in telecoms?

18. What should be the arrangements for funding the USO in future?

19. How could competition for the delivery of the USO be organised in future?

20. Should mobile technologies be used to help address the existing USO?

Annex C

Consultation response cover sheet

C.1 In the interests of transparency, we will publish all consultation responses in full on our website, www.ofcom.org.uk, unless a respondent specifies that all or part of their response is confidential. We will also refer to the contents of a response when explaining our decision, without disclosing the specific information that you wish to remain confidential.

C.2 We have produced a cover sheet for responses (see over) and would be very grateful if you could send one with your response. This will speed up our processing of responses, and help to maintain confidentiality by allowing you to state very clearly what you don't want to be published. We will keep your completed cover sheets confidential.

C.3 The quality of consultation can be enhanced by publishing responses before the consultation period closes. In particular, this can help those individuals and organisations with limited resources or familiarity with the issues to respond in a more informed way. Therefore Ofcom would encourage respondents to complete their cover sheet in a way that allows Ofcom to publish their responses upon receipt, rather than waiting until the consultation period has ended.

C.4 We strongly prefer to receive responses in the form of a Microsoft Word attachment to an email. Our website therefore includes an electronic copy of this cover sheet, which you can download from the 'Consultations' section of our website.

C.5 Please put any confidential parts of your response in a separate annex to your response, so that they are clearly identified. This can include information such as your personal background and experience. If you want your name, address, other contact details, or job title to remain confidential, please provide them in your cover sheet only so that we don't have to edit your response.

Cover Sheet for response to an Ofcom consultation

BASIC DETAILS

Consultation title:

To (Ofcom contact):

Name of respondent:

Representing (self or organisation/s):

Address (if not received by email):

CONFIDENTIALITY

What do you want Ofcom to keep confidential?

Nothing	☐	Name/contact details/ job title	☐
Whole response	☐	Organisation	☐
Part of the response	☐	If there is no separate annex, which parts?	

Note that Ofcom may still refer to the contents of responses in general terms, without disclosing specific information that is confidential. Ofcom also reserves its powers to disclose any information it receives where this is required to carry out its functions. Ofcom will exercise due regard to the confidentiality of information supplied.

DECLARATION

I confirm that the correspondence supplied with this cover sheet is a formal consultation response. It can be published in full on Ofcom's website, unless otherwise specified on this cover sheet, and I authorise Ofcom to make use of the information in this response to meet its legal requirements. If I have sent my response by email, Ofcom can disregard any standard email text about not disclosing email contents and attachments.

Ofcom seeks to publish responses on receipt. If your response is non-confidential (in whole or in part), and you would prefer us to publish your response only once the consultation has ended, please tick here. ☐

Name Signed (if hard copy)

Annex D

Terms of reference to the Strategic Review of Telecommunications[31]

Remit

D.1 Ofcom has decided that one of its first key tasks will be to review the UK telecommunications sector. We propose to undertake a comprehensive, wide ranging and evidence-based strategic review of these important and dynamic markets.

D.2 The Review will assess the options for enhancing value and choice in the UK telecommunications sector. It will have a particular focus on assessing the prospects for maintaining and developing effective competition in UK telecommunications markets, while having regard for investment and innovation.

D.3 This assessment will in turn shape the strategy through which Ofcom will promote competition or take other regulatory action to further the interests of consumers and citizens in the UK.

D.4 The key output of the Review will be an Ofcom statement specifying its approach to telecommunications regulation. This will enable casework and policy development to be located in a clear strategic framework going forward.

Why it matters

D.5 Telecommunications is a significant and growing sector in the economy. In 2002 UK telecommunications revenues were £50 billion compared to £18 billion in 1984 (at 2002 prices).

D.6 UK telecommunications revenue as a proportion of GDP has grown from 1.7 per cent in 1985 to 2.3 percent in 2002. According to the most recent data (1999-2002) net capital expenditure by the UK telecommunications industry was on average over £9 billion per year (at 2002 prices). This represents 8 per cent of all the capital expenditure in the UK economy as a whole over the same period. By contrast, in 1984 net capital expenditure in telecommunications was just £3.7bn (2002 prices) which represented around 4 per cent of all capital expenditure[32].

D.7 The sector has been regulated by Oftel since the privatisation of BT in 1984 and over the last 20 years much has changed in the telecommunications sector. There are now approximately 170 public fixed telecommunications providers, 5 mobile network providers, 59 mobile service providers and 700 internet service providers.

[31] These terms of reference were published by Ofcom in December 2003.
[32] Some data in this paragraph have been amended from the terms of reference published in December 2003 due to changes in the basis of calculation.

D.8 There are varying degrees of competition through the sector in the form of different services and at different points in the value chain. By 2002, BT's share of voice calls had fallen to 60 per cent and international calls to 30 per cent. However, in many markets such as residential access (82 per cent) business access (87 per cent) and wholesale call origination (78 per cent), Oftel has found that BT has Significant Market Power (SMP).

D.9 Technological innovation has driven changes in the underlying economics of the industry. There is increasing convergence between different sectors. In addition, the growth of the internet and the emergence of different broadband access technologies create new challenges and opportunities for the sector.

D.10 In other regulated sectors different models have emerged, with different lessons to learn. In gas and electricity a clear separation of wholesale from retail has created much higher levels of competition in service provision but has embedded regulation in distribution. In rail a similar separation has been adopted but has however failed to deliver the level of consumer benefit envisaged at the point of privatisation.

D.11 In other countries different models of regulation have been applied or a different emphasis has been placed within the context of a similar approach.

D.12 Oftel has undertaken many detailed reviews of particular parts of the sector over the last ten years. However, the sector as a whole has not been subject to a thorough and open strategic review since 1990/1991 when the Government, together with Oftel, conducted the Duopoly Review.

D.13 The telecommunications sector has undergone significant change since 1991. It faces major challenges in the future as technology and consumer demand evolve. Within the EU, the policy agenda will move beyond implementation of the most recent directives. These factors, together with the creation of a new sectoral regulator, make 2004 the right time to conduct a review of the UK's strategy for regulating telecommunications.

Overall Approach

D.14 The key building blocks of our proposed approach will be:

1. Analysis

D.15 The approach will be evidence-based and include a summary of the development of competition in telecommunications. The Review will provide an assessment of the current position in the sector and the prospects for the future. There will be a detailed analysis of the scope for the further development of effective competition and the scope for changes, including the possibility of removing regulation.

2. New Research

D.16 The Review will carry out a number of new research projects which will underpin the analysis and the recommendations. These will include market

research on changing consumer preferences, research on the impact of new technologies and detailed cost and business plan modelling.

3. Expert Advice

D.17 Ofcom will use expert external advisers to complement our own internal expertise. These advisers will bring to Ofcom additional detailed understanding of commercial activity, technical economic analysis and other areas.

4. Consultation

D.18 The Review will make full use of public consultation to allow all interested parties to submit information and set out their views and opinions on the key issues.

D.19 There will be two formal consultation stages to enable companies, groups and individuals to enter submissions and contribute to open discussions.

D.20 In addition we expect to hold a number of seminars and workshops during the course of the Review, the output of which will inform the final conclusions.

Scope of the Review

D.21 The main focus of this Review is to carry out a strategic assessment of the role of regulation in the telecommunications sector as a whole, with a focus on the role of competition in delivering benefits for citizen-consumers.

D.22 Broader strategic questions, including the availability of key services to consumers, will also be addressed. However, the Review will not deal directly with detailed issues of consumer protection. It is therefore anticipated that the Review will not:

- deal with the detail of Universal Service Obligations (this will be subject to a separate review by Ofcom during 2004); or
- cover in detail technical regulation, consumer protection regulation, numbering regulation and other matters contained in the General Conditions of Entitlement.

D.23 The Review will not replicate the detailed individual market reviews which have been completed or which will be completed shortly. However, the conclusions of the Review are likely to have implications for future market reviews.

D.24 Some of the key issues the Review will address are set out at the end of this annex.

D.25 The remainder of this annex sets out the key aims, objectives and the approach proposed for each stage of the project.

Three Phases

D.26 The project will be broken into three phases, with consultation at the end of Phases One and Two and separate reports at the end of Phases One, Two and Three. The phases are:

- **Phase 1** (to spring 04) - current position and prospects for the telecommunications sector;
- **Phase 2** (to summer 04) - options for Ofcom's strategic approach to telecommunications regulation; and
- **Phase 3** (to autumn 04) - Ofcom's approach to telecommunications regulation.

D.27 The following section sets out our current expectations of the work involved in each phase.

Phase 1 - Current position and prospects for the telecommunications sector

Aims

- to review the importance of telecommunications to the UK economy;
- to assess the extent to which the UK market has delivered competition at all levels including fixed, mobile, narrowband and broadband sectors;
- to examine how far competition and/or regulation has delivered the goals of lower prices, higher quality of service and wider choice;
- to assess how consumers view the market and how they value different product/service outcomes;
- to review investment and innovation trends in the industry; and
- to establish the prospects for the telecommunications sector in the future, particularly in relation to consumer behaviour, technology and competition.

D.28 The main elements of this phase are as follows.

Sector overview

- an analysis of the sector as a whole summarising the role and importance of telecommunications in the UK economy.

Audit of competition and consumer benefit

- an analysis of the degree of competition, market-by-market, building on the work undertaken in the recent market reviews;
- research into the relative value consumers place on different product/service attributes for telecommunications services;
- international benchmarking of prices and other indicators to review the comparative position of UK consumers;

- a financial analysis of the sector and key elements within it;
- an analysis of key trends and patterns of investment and innovation as they affect different parts of the telecommunications sector; and
- a brief review of past and current regulatory approaches.

Prospects and scenarios

- a review of the most likely prospects for the sector, including an examination of the technology trends, changing consumer preferences and industry prospects; and
- the development of alternative scenarios for the future of the telecommunications sector.

D.29 Much of the data required for this analysis will need to be collected from the industry. Ofcom looks forward to working with the industry in the collection and assessment of this data.

Report and Consultation

D.30 At the end of Phase 1 (spring 2004) a report will be published setting out Ofcom's conclusions on the current position in the telecommunications sector and the likely prospects.

D.31 There will be a public consultation on these conclusions and submissions from interested parties will be welcomed. A number of seminars and discussions will be held to explore the issues raised in the report.

D.32 Ofcom will incorporate the comments it receives in its Phase 2 work.

Phase 2 - Options for Ofcom's strategic approach to telecommunications regulation

Aims

- to assess the scope for effective competition at relevant levels in the telecommunications markets and the extent to which it is likely to be sustainable in the foreseeable future;
- in the light of that assessment, identify alternative approaches to regulating telecommunications markets and analyse their strengths and weaknesses; and
- to set out initial options for Ofcom's future approach to telecommunications regulation – including both where regulation may need to continue and opportunities for withdrawing from regulation.

D.33 The main elements of this phase are as follows.

An analysis of the underlying economics of competition

- an evidence-based analysis of the scope for sustainable competition in telecommunications markets, especially at the network level; and

- detailed cost and business plan modelling to understand better the underlying economics of potential competition in telecommunications.

Review of other relevant sectors and international practice

- both national and international research into alternative models of competition and regulation in telecommunications and other sectors.

Options for different strategic approaches to the regulation of telecommunications

- the development of criteria against which to assess alternative approaches to regulation; and
- the development of a number of options for regulation including a set of initial proposals for consultation.

D.34 For some of this analysis, in particular the cost and business plan modelling, Ofcom will require a significant amount of data from the industry.

D.35 Ofcom looks forward to working with the industry in the collection and assessment of this data.

Report and Consultation

D.36 At the end of Phase Two (Summer 2004) a report will be published for consultation.

D.37 This report will include initial policy proposals. Again external submissions will be welcomed and a number of seminars and discussions will be held. The report will also reflect any significant market developments that have taken place during early 2004.

D.38 The comments received will be considered in the preparation of the final report in Phase 3.

Phase 3 – Proposals

Aims

D.39 To produce a detailed final report which sets out:

- a review of the key policy issues and challenges; and
- a set of proposals for tackling these issues and challenges in a coherent regulatory framework. This will form the foundations of Ofcom's strategy for telecommunications regulation.

D.40 The main elements of this phase are as follows.

- further analysis of the options presented in the Phase 2 report in the light of comments received during the consultation;
- the development of clear proposals for Ofcom's regulatory approach; and

- the preparation of an implementation plan for the proposals including information on timing of any changes and the process for bringing those about.

Report

D.41 There will be a final report at the end of this phase (autumn 2004) which will include a statement of Ofcom's proposed approach.

Some Key Questions for the Strategic Review

D.42 The project remit aims to review the options for enhancing value and choice to UK citizen-consumers in the UK telecommunications sector.

D.43 The Review will seek to address a number of key questions, including:

- what is the position of UK consumers across a range of indicators including price, quality of service, range and choice of products and availability of services?
- how does the position of UK consumers of telecommunications compare with consumers in other countries? How does it compare with other sectors across a range of indicators?
- what is the extent of competition in main telecommunications markets today? How has that changed over time and how is it likely to develop in the future?
- how successful have past regulatory policies been in achieving their objectives?
- what are the likely prospects for the sector? What are the different scenarios for the future? What role do investment and innovation play in alternative future scenarios?
- how will technological change and consumer behaviour develop in the coming years and how are these likely to affect market structures?
- what is the scope for effective competition in telecommunications and the extent to which it is sustainable? How does this vary between, for example, infrastructure and service provision?
- what are the major barriers to effective competition and how they can be lowered?
- where is regulation effective and where is it ineffective?
- where are there opportunities for regulation to be withdrawn or minimised?
- what is the relevance of vertical integration in the telecommunications sector?
- what are the alternative models for regulation? What are the advantages and disadvantages of these?

Annex E

Glossary

2G	Second generation of mobile telephony systems using digital encoding. 2G networks support voice, low speed data communications, and short messaging services.
2.5G	In mobile telephony, 2.5G protocols extend 2G systems to provide additional features such as packet-switched connection (GPRS) and enhanced data rates.
3G	Third generation mobile systems. 3G provides high-speed data transmission and supporting multimedia applications such as full-motion video, video-conferencing and internet access.
21st Century Network, or 21CN	BT's 21st Century Network, its planned next generation core network
Access competition	Competing telecoms networks which reach all the way to the customer. For example, when a cable operator competes with BT, it does so by having a separate wire into a home or business.
Access network	The part of the network which provides the connectivity between the customer's premises and network operator's transport network
ADSL	Asymmetric Digital Subscriber Line. A digital technology that allows the use of a copper line to support high bandwidths in one direction and a lesser bandwidth in the other.
AISBO	Alternative Interface Symmetric Broadband Origination; wholesale access products such as LAN extension service and backhaul extension service.
Allocative efficiency	Achieved when prices are close to cost: this ensures that all consumers who value a product at more than its cost are able to purchase it.
Altnet(s)	Alternative fixed network operator.
ATM	Asynchronous Transfer Mode, a standard for high speed data communications.
Bluetooth	Wireless standard for short-range radio communications between a variety of devices such as PCs, headsets, printers, mobile phones, and PDAs.
Bottleneck	The part of a network where the economics of supplying alternative networks are such that effective competition is unlikely to emerge.
British Telecommunications Act	The 1981 British Telecommunications Act, which separated British Telecommunications (BT) from the Post Office.
Broadband	An service or connection generally defined as being 'always-on', and providing a bandwidth greater than 128kbit/s.
BSG	Broadband Stakeholders Group.
BT	British Telecommunications plc.
Bundling	Linking the purchase of one product or service to another, either by selling only as a package, or through the use of discounts for joint purchasing.
CC	Competition Commission.

Communications Act	Communications Act 2003, which came into force in July 2003.
Core network	The centralised part of a network, characterised by a high level of traffic aggregation, high capacity links and a relatively small number of nodes.
Corporate network services	Data networking services provided to corporate customers, such as wide area networks.
CPI	Comparative Performance Indicator.
CPS	Carrier Pre-selection. The facility offered to customers which allows them to opt for certain defined classes of call to be carried by an operator selected in advance (and having a contract with the customer) without having to dial a routing prefix, use a dialler box, or follow any other different procedure to invoke such routing.
Data Networks	A network established and operated for the specific purpose of providing data transmission services.
DSL	Digital Subscriber Line. A family of technologies generally referred to as DSL, or xDSL, capable of transforming ordinary phone lines (also known as 'twisted copper pairs') into high-speed digital lines, capable of supporting advanced services such as fast internet access and video-on-demand. ADSL, HDSL (High data rate Digital Subscriber Line) and VDSL (Very high data rate Digital Subscriber Line) are all variants of xDSL.
Duopoly Framework	The telecoms regulatory framework applying in the UK from 1984 to 1991, when fixed telecoms were provided by a duopoly of BT and Mercury.
DVB	Digital Video Broadcasting.
Dynamic efficiency	Achieved when firms have the correct incentives to invest (e.g. in new infrastructure) and to innovate (e.g. to generate new technologies or products).
EBITDA	Earnings Before Interest, Depreciation and Amortisation.
Enterprise Act	Enterprise Act 2002 which, among other things, updates the current UK merger control framework with certain significant amendments.
Equivalence	The principle that BT's wholesale customers should have access to the same or a similar set of mandated wholesale products, at the same prices and using the same or similar transactional processes, as BT's own retail activities.
ETSI	European Telecommunications Standards Institute, which has the primary responsibility within Europe for the production of telecommunications standards for pan-European application.
Ex ante	Before an event takes place.
Ex post	After an event takes place.
FCC	Federal Communications Commission. The US regulatory body that regulates all inter-state and foreign communications by wire, radio and television. Intra-state communications are regulated by state public utilities commissions.
Forbearance	The deliberate and publicly-announced decisions by a regulator to abstain from intervention in a particular area.
Frame Relay Service	A packet-switched data service providing for the interconnection of Local Area Networks (LANs) and access to host computers.
GDP	Gross Domestic Product.

GPRS	General Packet Radio Service, a packet data service provided over so-called 2.5G mobile networks.
GSM	Global Standard for Mobile Telephony.
Horizontal consolidation	Mergers of companies who provide services in the same product market or the same stage in the value chain.
ICT	Information and Communications Technology.
Infrastructure-based competition	Competition between alternative telecoms operators who use their own infrastructure to supply some or all of the call routing.
Interconnection	The linking of one Public Electronic Communications Network to another for the purpose of enabling the people using one of them to be able (a) to communicate with users of the other one; (b) to make use of services provided by means of the other one (whether by the provider of that network or by another person).
Interface	A set of technical characteristics describing the point of connection between two telecommunication entities.
Internet telephony	A specific type of VoIP service that uses the public internet to carry the IP traffic (also referred to as Voice over the Internet).
Internet	A global network of networks, using a common set of standards (e.g. the Internet Protocol), accessed by users with a computer via a service provider.
Interoperability	The technical features of a group of interconnected systems which ensure end-to-end provision of a given service in a consistent and predictable way.
IP	Internet Protocol. The packet data protocol used for routing and carriage of messages across the internet and similar networks.
ISP	Internet Service Provider. A company that provides access to the internet.
ITU	International Telecommunications Union. A group of representatives from 161 countries headquartered in Geneva, Switzerland. The ITU publishes recommendations that influence telecom engineers, designers, manufacturers, and service providers around the world. These have the status of an international treaty and are binding on member states.
Jumpering	The process of physically connecting the customer's access line to the terminating equipment in the local node.
LAN	Local area network. A network allowing the interconnection and intercommunication of a group of computers on a single site, primarily for the sharing of resources and exchange of information (e.g. email).
LLU	Local Loop Unbundling. A process by which BT's exchange lines are physically disconnected from BT's network and connected to other operators' networks. This enables operators other than BT to use the BT local loop to provide services to customers.
Local access	Connection between the customer's premises and the local PSTN exchange.
Local Loop	The access network connection between the customer's premises and the local PSTN exchange, usually a loop comprised of two copper wires.
Long distance network competition	Competitors use their own networks for the long distance portion of the call, but use the established operator's network for the local access part of the call.
LRIC	Long Run Incremental Cost. The costs caused by the provision of a defined increment of output, taking a long run perspective,

	assuming that some output is already produced. The 'long run' means the time horizon over which all costs (including capital investment) are variable.
Market power	The ability to raise prices above the competitive level for a non-transitory period.
Mercury	Mercury Communications Limited, the only fixed telecoms competitor to BT from 1984 to 1991.
Messaging service	A service enabling customers to exchange messages with each other through 'mailboxes' embedded in network equipment. Both voice and text messaging services are available.
MMC	Monopolies and Mergers Commission.
MPLS	Multi Protocol Label Switching, an IP technology used in many virtual private network (VPN) services.
Narrowband	A service or connection providing data speeds up to 128kbit/s, such as via an analogue telephone line, or via ISDN.
National Rate	The tariff for calls within the national call area.
NGN	Next generation network
NRA	National Regulatory Authority.
NTS	Number Translation Services. Telephone services using non-geographic numbers where that number is translated to a geographic or mobile number for final delivery to the called party.
OECD	Organisation for Economic Co-operation and Development.
OEE	Office of the E-Envoy.
Ofcom	Office of Communications. The regulator for the communications industries, created by the Communications Act.
Oftel	Office of Telecommunications, whose functions transferred to Ofcom on 29 December 2003.
ONS	Office for National Statistics.
PDA	Personal Digital Assistant.
Productive efficiency	Achieved when the costs of production are minimised.
PPC	Partial Private Circuit; a wholesale network access product.
PSB	Public Service Broadcasting.
PSTN	Public Switched Telephony Network.
ROCE	Return on Capital Employed.
RPI	Retail Price Index.

Satellite DTH	Satellite Direct to Home television services, such as that provided by BSkyB in the UK.
SDSL	Symmetric Digital Subscriber Line. Unlike ADSL, it offers the same fast data rate speeds in both directions.
Service provider competition	Competitors who do not own all their own infrastructure, but provide services that are conveyed over others' networks.
Service provider	A provider of electronic communication services to third parties whether over its own network or otherwise.
SME	Small or Medium sized Enterprise.
SMP	Significant Market Power. This test is set out in the EU Framework Directive, and is aligned with the competition law definition of 'dominance'. It is used by Ofcom to identify those operators who may be required to meet additional regulatory obligations.
Spam	Unsolicited commercial email of other unsolicited communications.
TISBO	Traditional Interface Symmetric Broadband Origination; such as partial private circuits.
Telecommunications Act	Telecommunications Act 1984.
Telecommunications, or 'Telecoms'	Conveyance over distance of speech, music and other sounds, visual images or signals by electric, magnetic or electro-magnetic means.
Tetherless	Devices connected to a network which have limited mobility, using short range radio-based systems, such as DECT, Bluetooth and Wireless LAN.
Universal Service Provider	Telecoms operators who are designated by Ofcom as Universal Service Providers. Currently BT and, in the city of Hull, Kingston Communications.
Universal Service	Under the Communications Act, the set of telecoms services set out by the Secretary of State for Trade and Industry which define a certain minimum set of services that should be provided to all citizens, or to those with special needs.
USD	The Universal Service Directive passed by the European Commission.
USO	Universal Service Obligations. The set of Universal Services that Universal Service Providers are required to supply.
Value chain	The sequential stages in production of a product or service.
VANS	Value Added Network Services.
Vertical integration	Mergers , or co-ownership between, producers that are active in different stages in the value chain for a particular good or service.
VoIP	Voice over Internet Protocol. A technology that allows users to send calls using Internet Protocol, using either the public internet or private IP networks.
VPN	Virtual Private Network. A technology allowing users to make inter-site connections over a public telecommunications network that is software-partitioned to emulate the service offered by a physically distinct private network.
WAN	Wide area network. A network allowing the interconnection and intercommunication of a group of computers over a long distance.

WAP	Wireless Application Protocol.
Wireless LAN or WiFi (Wireless Fidelity)	Short range wireless technologies using any type of 802.11 standard such as 802.11b or 802.11a. These technologies allow an over-the-air connection between a wireless client and a base station, or between two wireless clients.
WiMax	802.16, a fixed wireless access technology.
WLR	Wholesale Line Rental. A regulatory instrument requiring the operator of local access lines to make this service available to competing providers at a wholesale price.