Review of the wholesale local access market

Consultation on market definition, market power determinations and remedies

Consultation

Publication date: 23 March 2010

Closing date for responses: 1 June 2010

Contents

Section 1

Summary

Purpose of this document

1.1 This document is a consultation on our analysis of the state of competition in the Wholesale Local Access ("WLA") market, and the measures that we are proposing to address concerns over the degree of competition in that market.

1.2 These proposals matter for consumers because ultimately they will affect the price, choice and availability of critically important retail services, such as current broadband and traditional voice services. However, the WLA market directly concerns services provided between different communications providers ("CPs"). Our proposals also matter because they are intended to promote competition and investment in new 'super-fast' broadband networks, in the important early stages of development for such networks.

1.3 The WLA market concerns fixed telecommunications infrastructure - the physical connection between a consumer's premises and the local telephone exchange. This connection is needed to support fixed line services such as voice calls and broadband internet access. The cost of this connection therefore affects the prices that consumers pay for those services. Also, if this connection fails then consumers' services will fail. The WLA market is therefore critical to all fixed line services.

1.4 In reviewing this market we are seeking to establish whether there is sufficient competition in the supply of fixed telecommunications connections. Our ultimate goal in this market review is to protect consumers' interests by using regulation to promote competition and choice in the delivery of fixed line telecommunications services. This will help to ensure that consumers do not have to pay excessive prices for those services, and that they benefit from innovation and investment.

The context for our proposals

1.5 As well as looking at current competitive conditions, this market review looks ahead to likely developments over the next few years. This period will coincide with the early stages of the UK's evolution to new super-fast broadband services. These services will be based on network upgrades, to provide connections over optical fibre some or all of the way to the consumer. Such next generation access ("NGA") networks fall within the scope of the WLA market.

1.6 Super-fast broadband will support higher network speeds than those currently available to most UK consumers. Whilst broadband based on traditional copper networks has a maximum download speed of up to 24 Mbit/s, super-fast broadband will offer speeds in excess of this.

1.7 Currently, evidence suggests that, where deployed, NGA networks are being used for video-based applications, including broadcast-quality TV. NGA networks are also likely to be important in providing broadband access to multi-PC homes. Nonetheless, considerable uncertainty remains regarding the range of services that will be provided over super-fast broadband. Experience from overseas deployments shows that there is experimentation in the types of services being offered. We consider that it is important to take a regulatory approach that is flexible enough to

allow for experimentation in innovative new products and services, whilst at the same time preventing consumer detriment as a result of firms exploiting market power.

1.8 BT and Virgin Media are both now offering retail services that are based on NGA developments. BT's current plan for deploying its NGA network runs to the end of 2012, by which time it aims to cover around 40 per cent of UK premises. Under BT's plans, three-quarters of those premises would be supplied using by fibre-to-the-cabinet ("FTTC") technology and the rest by fibre-to-the-premises ("FTTP") technology.

1.9 In January 2010, BT's retail business announced the prices it will charge for its 'BT Infinity' super-fast broadband service as it upgrades its network. Virgin Media has upgraded its cable network, which is capable of serving around half of UK households (although its UK market share is 16 per cent[1]). It has been offering super-fast broadband services since the end of 2008. Other CPs have indicated that they are interested in deploying NGA, either through private investment or based on public funding to allow deployment in areas where commercial deployments may not be as attractive.

1.10 Despite these NGA developments, it is important to recognise that in the next few years, most of the supply in the WLA market is expected to be based on current generation access ("CGA") copper-based networks. We understand that BT does not intend to cease using its CGA network in the foreseeable future. Whilst NGA networks will be used to supply super-fast broadband, CGA networks will continue to support telephony and lower-speed broadband services. Therefore, it is important to continue to deliver effective regulation of CGA networks at the same time as supporting a smooth transition to NGA networks.

The market review process

1.11 We periodically review various markets, according to both European and domestic legal requirements, including the Communications Act 2003 ("the Act"). The market review process is divided into three parts. First, we define the scope of the market that we are assessing (both the products in the market and its geographic scope). Then we assess whether any CPs have a position of significant market power ("SMP"), which in simple terms means the power to influence markets to a significant degree in a way that could harm consumers[2]. Then, if any CPs have SMP, we assess which regulatory remedies might need to be imposed to address that SMP.

1.12 As well as this WLA market review, we are currently also reviewing the related Wholesale Broadband Access ("WBA") market, and have also published consultation proposals on that market today ("the WBA consultation document")[3]. Our WLA proposals should be viewed in conjunction with the WBA proposals in order to understand the overall proposed impact on consumers.

1.13 The WBA market concerns the wholesale broadband services which are used by CPs to provide retail broadband services to business and residential consumers. The WBA market therefore sits between the WLA market and the retail broadband market. Regulation in the WBA market takes into account how much infrastructure competition there is in the WLA market (including as a result of regulation of the WLA

[1] As a proportion of active lines
[2] Formally, SMP is defined as 'a position of economic strength affording an undertaking the power to behave to an appreciable extent independently of competitors customers and ultimately consumers'
[3] See http://www.ofcom.org.uk/consult/wba/

market). Effective and sustainable infrastructure competition tends to give rise to the greatest benefits in terms of the mix of lower prices and faster innovation. Where there is effective competition in the WLA market, further regulation of the WBA market is unnecessary. This is why we are reviewing these markets at the same time.

Summary of proposals

Market definition

1.14 We propose that the WLA services within this market are those based on copper loops, cable networks and optical fibre, at a fixed location. We propose that the market excludes WLA services based on mobile, fixed wireless and satellite technologies. We also propose that WLA services for business and residential use are in the same market.

1.15 We propose that there are two separate geographic WLA markets:

- The UK excluding the Hull area; and
- The Hull area.

Market power assessment

1.16 Our proposed SMP findings in the WLA market are as follows:

- BT has SMP in the UK excluding the Hull area; and
- KCOM has SMP in the Hull area.

1.17 One of the key reasons why we are proposing that BT has SMP is its high market share, which is 84 per cent[4]. As the WLA market covers both CGA and NGA networks, Virgin Media's earlier NGA deployment does not in itself radically change its market share. Market shares are based on take-up, not deployment (although the two are obviously related).

1.18 As we consider that there is SMP in both of these markets, we are proposing to introduce regulatory requirements on BT and KCOM to address the identified competition problems. Under the legal framework governing our proposals, it is only possible to impose obligations on those CPs that have SMP. We therefore are not proposing regulatory obligations on other CPs in this market – including Virgin Media.

Remedies for market power

1.19 To address BT's SMP, we are proposing a number of complementary regulatory obligations (SMP remedies). We propose that BT should have to provide other CPs ("OCPs") with access to its network in the following ways:

- Local Loop Unbundling ("LLU"): a current remedy, this allows OCPs to physically take over (or share) BT's existing copper lines between the local telephone exchanges and the customer premises;

[4] Of active access lines in the UK

- Virtual Unbundled Local Access ("VULA"): this would have to be provided by BT wherever it has deployed its NGA network[5]. The intention is that VULA would provide access to the NGA network in a way that is similar to how LLU provides access on the CGA network. However, rather than providing a physical line, VULA would provide a virtual connection that gives OCPs a dedicated link to their customers and substantial control; and

- Physical infrastructure access ("PIA"): like VULA, this is a proposed new remedy. This remedy would allow OCPs to deploy fibre in the access network using BT's ducts and poles - either to support deployment of FTTP technology, or to support deployment of FTTC technology (by enabling a 'backhaul' connection between street cabinets and the OCP's network). BT would be required to produce a draft reference offer ("RO") for duct access within three months, with a view to launching a product within eight months.

1.20 In addition we propose that BT should continue to provide sub-loop unbundling ("SLU"). This is a current remedy (but currently only used in very limited situations) which allows OCPs to physically take over (or share) the part of BT's existing copper lines between a street cabinet and the customer premises. This remedy would allow OCPs to deploy FTTC technology where they consider this to be economic.

1.21 Based on the proposed specific access products, OCPs will be able to use BT's network infrastructure to develop their own services to offer to consumers, thereby lowering barriers to entry and investment. VULA would also support competition in (downstream) voice markets by providing BT and OCPs with an equivalent input for developing those voice products. We would expect BT's downstream businesses to use VULA as an input when providing voice services over fibre.

1.22 At this point, we consider VULA to be the primary focus of NGA competition, to supplement the continuing effective LLU remedy over at least the next four years. Our economic analysis suggests that VULA is very likely to be the most cost-effective NGA remedy to support competition. However, we think that both SLU and access to BT's ducts and poles could also play a part in supporting competition, as well as investment in NGA. Partly, this is because VULA will only be available where BT deploys its NGA network.

1.23 We propose that prices for LLU, SLU, and PIA should be related to the cost of providing them[6]. However, we are not proposing to set regulated prices for the product(s) that BT provides under its VULA obligation. This would give BT the flexibility to price its VULA services according to emerging information on the demand for, and supply costs of, NGA services.

1.24 In addition to requiring the specific products above, we are also proposing a set of general access remedies on BT, all of which are imposed on them currently in this market. These include a requirement to provide network access, an obligation to not discriminate unduly when providing services, various transparency measures (including on its quality of service), and a requirement to keep separate accounts for different services (to support effective regulation). For VULA, we propose to apply a strict interpretation of the no undue discrimination obligation, which would mirror the definition of Equivalence of Inputs ("EoI") in the BT Undertakings.

[5] This would apply both to FTTC and FTTP deployments
[6] Based on the long-run incremental cost of provision, including an appropriate element of BT's common costs

1.25 For KCOM, we are proposing to maintain the general access remedies that are currently imposed on it in this market[7]. These include a general requirement to provide network access and a no undue discrimination obligation. We are also proposing to add a general requirement on them, to meet reasonable requests for new network access. We are proposing this to encourage OCPs to enter the WLA market in Hull. At this time, we are proposing - in line with the current position - that KCOM should not be required to provide any specific access products, such as access to its duct and pole infrastructure.

Reasoning for our key proposals on remedies

1.26 In proposing the combination of remedies on BT outlined above, our primary goal is to promote effective and sustainable competition across the range of different situations that will exist in this market in the next few years. At the same time, we are mindful of the beneficial impact on competition and consumers of promoting investment in NGA services at this important time for their development.

1.27 We have commissioned independent research to assess the costs and practicalities of achieving NGA competition in BT's network. The evidence suggests that where BT deploys an NGA network, the most cost-effective and straightforward way to support competition is to allow OCPs to access that new network, rather than to invest in their own parallel NGA infrastructure. This is why we are proposing the VULA obligation on BT. The information available to us at present also suggests that, as long as BT delivers a service with the requisite characteristics, VULA would offer the best prospects for reproducing the kind of competition in NGA (at least in the short- to - medium term) that LLU has provided in CGA.

1.28 However, we think that there is potential for other WLA access remedies to contribute to delivering competition and NGA investment, because:

- SLU can be used (in combination with duct access) to deploy an FTTC network; and
- PIA can be used to deploy an FTTP network and/or for FTTC backhaul.

1.29 There are a number of reasons why we consider these two additional remedies to be appropriate:

- BT's NGA deployment plans currently only cover 40 per cent of UK premises. Also, the sequence of those deployments is not currently certain. Therefore, these other remedies could enable OCPs to deploy NGA infrastructure before BT in some areas, thereby competing with BT's existing CGA network[8] and providing NGA services earlier to some areas;
- Whilst the cost of competing based on SLU or PIA appears at present to be high, compared to using VULA, technological developments could change the relative costs over time;
- The relative benefits of providing NGA services in different ways are currently unclear, because the demand for NGA services is still at an early stage. The type of services and level of demand might in due course give more support to SLU and/or to PIA;

[7] in the Hull Area only
[8] We are proposing that CGA and NGA services are in the same WLA market

- The prospects for using SLU and PIA will differ between areas, so both of these options should be available. The reasons for this include: the variability in the capacity available in BT's network; small street cabinet sizes that make it uneconomic to serve a limited number of customers using SLU; and the varying locations of OCPs' existing networks. We consider that BT's own plan for a mix of NGA deployment types supports our proposals.

1.30 As well as providing OCPs with the opportunity to compete with BT's and Virgin Media's NGA deployments, these WLA remedies will give OCPs the opportunity to provide NGA services in areas where there are no current BT plans to deploy NGA services. We consider that having a choice of remedies available to suit different locations is in the best interests of consumers across the UK, and may help to limit the prospects of a digital divide in the delivery of NGA services.

1.31 Our proposals to support different means of NGA deployment are separate from current central government proposals on universal broadband provision and public subsidy of NGA developments. However, we consider our proposals to be complementary to those initiatives, as they should lower the barriers to investing in NGA infrastructure. Additional public subsidy to encourage NGA deployments could be used in conjunction with the additional network access products that we are proposing. If such investments occur in locations that would not otherwise have attracted commercial interest, at least not on the same timeframe, the proposed access obligations on BT would also contribute to meeting universal broadband targets. However, as with CGA, even with effective SMP remedies in place, there are likely to be geographic limits to how far CPs will want to invest in NGA infrastructure.

1.32 It should be acknowledged that there are challenges in developing competition based on SLU or PIA. However, we nevertheless believe that these remedies could have a significant role to play. Therefore, for the PIA obligation, we are proposing a firm timeline for BT to develop and implement usable products and processes. Our aim is to reduce the barriers to entry, and to equip OCPs with the relevant information on their choices. It will then be for the market to determine the best way of competing, which may differ between areas and between CPs.

1.33 With regard to our proposals to allow BT flexibility in the pricing of its VULA products(s), we consider that this gives BT the opportunity to promote the efficient deployment and use of its new NGA network (and thereby recover the costs of developing it). We consider that this approach will promote investment in NGA. We also consider that whilst BT still has its CGA network, and is providing services to OCPs using that network, the (regulated) prices that OCPs pay for CGA services will help to constrain the prices that BT can charge for the (upgraded) NGA services.

1.34 With regard to the Hull area, to date OCPs have chosen not to compete in the WLA market (or even in the retail market). We therefore consider that it would be disproportionate to require KCOM to invest in developing specific access products, as it seems unlikely that they would be taken up. We consider that the general access remedies on KCOM are sufficient as they will allow any OCPs to request access if they wish to enter the Hull market. However, we are proposing to introduce a new requirement on KCOM as a means to encourage entry into the Hull market. Under this requirement, KCOM would have to create a Statement of Requirements ("SOR") process, which should clarify the process for requesting new access products.

1.35 We are aware that consumers in the Hull area have a very limited choice of providers, because of the lack of entry into the market by providers other than

KCOM. Potentially, this lack of competition could result in consumers in Hull paying higher prices and receiving less attractive service propositions. This might suggest a need to consider closer regulation on KCOM's prices and services at the retail level. However, we have examined the retail offers available to consumers in the Hull area. This shows that whilst consumers in Hull may not have access to the best offers available in some other parts of the UK (where providers such as Sky and TalkTalk have deployed their own networks), they do have access to products that are comparable in terms of price and specification to those available to many consumers in the rest of the UK. Therefore, whilst we will continue to monitor the position in Hull, we do not propose to carry out a further review of the retail market at this time[9].

Consultation and next steps

1.36 We invite comments from interested parties on the proposals in this document. The consultation period runs for 10 weeks, to 1 June 2010. We aim to publish our conclusions during Autumn 2010.

1.37 There are also a number of important practical issues to consider if we decide, following the consultation process, to implement the proposed new SMP remedies on BT. Firstly, there would be a need to ensure that BT's VULA-based product(s) is fully compliant with the characteristics that we specify for this product. There are currently some differences between VULA and the Generic Ethernet Access ("GEA") products that BT (Openreach) has been developing to provide a wholesale service to CPs based on its FTTC and FTTP NGA deployments:

- For the FTTC GEA products, BT has so far proposed to make them available only in combination with other products/service. However, we consider that a VULA service would need to be made available on a stand-alone basis; and

- For the FTTP-based GEA products, BT has chosen to embed a voice analogue telephone adaptor ("ATA") into the network termination equipment ("NTE"), which currently is a necessary part of the GEA product. We recognise that there are good economic and commercial reasons for this approach. However, to meet the VULA requirements, we consider that the arrangements known as 'open ATA' (which include control for interconnecting CPs) will be an essential requirement if the voice ATA is embedded into the GEA/VULA product.

1.38 Further work would also be needed on the details of the PIA products that BT should offer. This would require the involvement of OCPs as well as BT, and would need to happen before detailed work on the pricing of these products could be done. Our proposed obligation requires BT to produce an initial RO for duct access, describing the service to be made available, within three months of the obligation being introduced. Significant OCP involvement would be needed at that time, and ideally before, to take BT's proposal forward.

1.39 We will be considering these practical issues further during the consultation period, and we would welcome discussions with CPs during that time to inform our decisions on any relevant obligations.

[9] See the WBA consultation document for retail price comparison for KCOM services

Section 2

Introduction

Purpose of this consultation

2.1 This consultation considers the level of competition and the regulation that should apply in the economic market for wholesale local access, or 'WLA'. Put simply, the WLA market covers fixed telecommunications infrastructure, specifically the physical connection between end users' premises and a local exchange. This connection is needed to support fixed line services, such as telephony and broadband. The charge for this connection therefore affects the prices that end users pay for their services. Equally, if this connection fails then end users' services will fail. The WLA market is therefore critical to all fixed line services.

2.2 Market reviews are carried out to assess the competitive conditions that exist in a market and, where there is not a sufficient level of competition, impose obligations (remedies) that address any potential negative effects that arise from the lack of competition. The ultimate goal is to ensure that customers enjoy sufficient choice and benefit from the lower prices and increased product innovation that arises from competition.

2.3 In reviewing the WLA market, we are seeking to establish whether there is sufficient competition in the supply of fixed telecommunications connections. In practice, this market consists of a few very large providers - BT, KCOM (in the Hull area) and (in certain areas) Virgin Media.

2.4 The requirements to conduct market reviews, and the processes to follow when doing so, are closely defined by various legislation and guidance at a European and a national level (see paragraph 2.21). However, we still have significant discretion on the decisions that will best support competition and the right consumer outcomes in the UK's specific circumstances.

Strategic context for this market review

2.5 In undertaking a market review, we consider the potential market and technological developments in the next few years, so that our decisions reflect those developments as well as current competitive conditions. In this market review, a forward look is particularly relevant because the next few years will represent the early roll-out period for NGA networks, which will enable the delivery of 'super-fast' broadband services.

2.6 Super-fast broadband is generally taken to mean broadband products that provide a maximum download speed that is greater than 24 Mbit/s. This threshold is commonly considered to be the maximum speed that can be supported on current generation (copper-based) networks[10]. Of course, the actual speed experienced by consumers depends on factors such as distance from the local exchanges[11]. To achieve higher

[10] Using "ADSL2+" technology
[11] Ofcom, *UK broadband speeds 2009*,28 July 2009 http://www.ofcom.org.uk/research/telecoms/reports/broadband_speeds/broadband_speeds/broadbandspeeds.pdf

speeds than 24 Mbit/s, CPs would need to use alternative technology, based on providing a connection over optical fibre some or all of the way to the customer.

2.7 We have been considering for some time, in consultation with many stakeholders, the appropriate regulation to promote investment and competition in NGA. A key output of that work was our March 2009 statement on ("the Super-fast Broadband statement")[12]. At the same time as following the standard market review processes, this market review represents a major part of implementing the strategic approach that we have developed over this period.

2.8 Currently, evidence suggests that, where deployed, NGA is being used for video-based applications, including broadcast-quality TV. NGA is also likely to be important in providing broadband access to multi-PC homes. Nonetheless, considerable uncertainty remains regarding the range of services that will be provided over super-fast broadband. Experience from overseas deployments shows that there is experimentation in the types of services being offered. We consider that it is important to take a regulatory approach that is flexible enough to allow for experimentation in innovative new products and services, whilst at the same time preventing consumer detriment as a result of firms exploiting market power.

2.9 BT and Virgin Media are both now offering retail services that are based on NGA developments. Virgin Media has been offering super-fast broadband services since the end of 2008. In January 2010, BT's retail business announced the prices that will be charged for its 'BT Infinity' super-fast broadband service as it upgrades its exchanges.

2.10 The current status of NGA deployments is as follows:

- Virgin Media has been offering super-fast broadband services since the end of 2008, and it completed the rollout of 50 Mbit/s capability across its entire network in Q3 2009. Its network covers 46 per cent of UK households, although its market share is only 16 per cent of active UK access lines (CGA and NGA lines combined). In February 2010, Virgin Media reported 41,000 subscribers on the 50 Mbit/s broadband service. It also announced plans to launch a 100 Mbit/s service at the end of 2010, and to complete the rollout of a 100 Mbit/s capability across its whole network by the end of 2011;

- BT is deploying new technology now. Its current plan is to cover around 40 per cent of UK households by the end of 2012. Of these, 30 per cent of UK households would be covered using fibre-to-the-cabinet (FTTC) technology, in which the current copper network from street cabinet to customer premises will still be used to deliver services. BT's current FTTC products have download speeds of up to 40 Mbit/s. The remaining 10 per cent of BT's deployment plans involve fibre-to-the-premises (FTTP) technology. BT's current FTTP products have download speeds of up to 100 Mbit/s. We expect a significant geographic overlap between BT's deployments and the areas in which Virgin Media currently offers services;

- KCOM (which has 100 per cent of access lines in the Hull area) has not yet announced any firm plans to deploy NGA technology; and

[12] See: Ofcom, '*Delivering super-fast broadband in the UK'* statement, 3 March 2009, http://www.ofcom.org.uk/consult/condocs/nga_future_broadband/statement/statement.pdf; Ofcom, Also notable is the statement '*Next Generation New Build*', 23 September 2008 http://www.ofcom.org.uk/consult/condocs/newbuild/statement/new_build_statement.pdf

- Some smaller CPs have indicated they are interested in providing NGA, either through private investment or based on public funding to allow deployment in areas where commercial deployments may not be as attractive.

2.11 As set out above, BT's and Virgin Media's current investment plans for NGA do not cover the whole of the UK. This raises the prospect that a significant proportion of the country would not have access to NGA services. However, there are several ways in which this potential gap might be avoided or minimised:

- Using regulations, through this market review, that allow OCPs to invest and offer services to customers using existing telecommunications infrastructure. This is what is meant by 'contestability' - one of the key principles that we have established in our strategic approach to NGA. We have taken this principle into account when developing the proposals in this document; and

- Other public sector decisions to promote competition and investment. For example, this could include action to allow new fibre networks to be built using non-telecommunications infrastructure (e.g., sewers) that is beyond our remit. Also, there is potential for public subsidy to make NGA deployments more attractive in areas that might not be the first choice for commercial investment.

2.12 BT initially plans to leave its existing copper network in place. The new NGA network would be used to supply super-fast broadband whilst the existing network would continue to support telephony services. However, we anticipate that at some point in the future BT will want to remove the old network. We consider that this will not happen before we conduct a further review of this market, so this issue is not of major significance for the proposals in this document.

2.13 We are also currently reviewing the 'wholesale broadband access' (WBA) market, because the WLA and WBA markets are closely related. We have also published today a consultation document on our proposals for the WBA market. The WBA market covers the provision of wholesale broadband services by BT and OCPs, which are in turn used to support retail broadband services to end users. The WBA market is linked to the WLA market because WLA services are one of the necessary building blocks for creating a WBA service. Together, the decisions taken (following consultation) in the WLA and WBA market reviews will affect how competition and investment in broadband services will develop in this important early stage for NGA networks.

Market developments since the 2004 WLA market review

2.14 Since the last market review, which was conducted in 2004, there has been an expansion in the number and value of services delivered over fixed access lines, associated with the growth in broadband internet services. Also, recently we have seen significant developments with regard to investment in NGA technology.

WLA Services

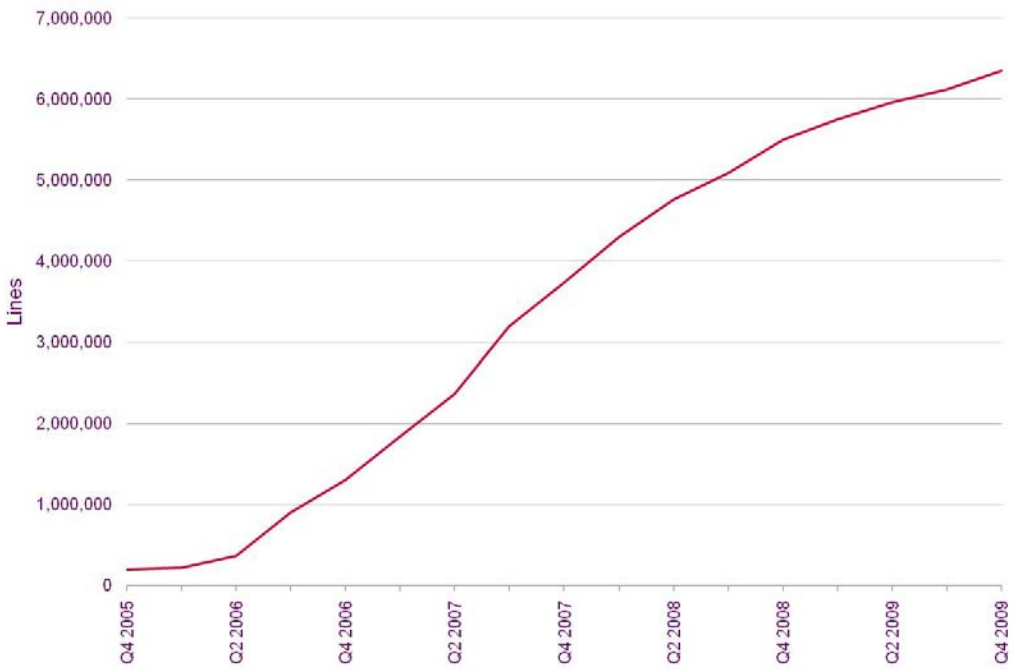
2.15 WLA services are used as an input to supply fixed voice, dial-up internet and broadband internet services to residential and business consumers. Local access services are also used to deliver pay TV, primarily over Virgin Media's cable network, though BT offers pay TV services as well. At the retail level the main development over the past six years has been the expansion of internet services and, within this, the large scale switch from dial-up to broadband-based services. At the wholesale level, the main development has been an expansion in the take up by OCPs of

wholesale products used to supply broadband, in particular LLU. Under LLU, a CP takes full (or shared) control of the copper line from a BT local exchange to the customer premises.

2.16 In 2009 73 per cent of households had internet access compared with 65 per cent in 2004.[13] At the same time, there has been a large shift towards broadband services with 96 per cent of home internet connections being broadband access in Q1 2009 compared to just 13 per cent in 2003.[14] Similarly, penetration for business broadband increased from 27 per cent in 2004 to 61 per cent in 2008.[15]

2.17 There has been a corresponding increase in demand from third parties for wholesale access inputs underlying these services. As shown in Figure 2.1 below, between Q4 2005 and Q4 2009 LLU take up increased by an average of 22 per cent each quarter, with the total volume increasing from 200,000 lines to 6.3 million[16]. As of February 2010 this figure stood at 6.5 million lines. The demand for LLU inputs has come from multiple network operators, four of which now have UK coverage for their LLU-based services exceeding 60 per cent. This has led to the creation of a highly competitive retail market for broadband.

Figure 2.1 Take-up of LLU products



Source: BT, Office of the Telecoms Adjudicator ("OTA)"
Note: Both MPF and SMPF have been included in the number of lines

[13] Ofcom, *Consumer Experience*, 2009 - http://www.ofcom.org.uk/research/tce/eval09/tidb.pdf
[14] Ofcom, *Consumer Experience*, 2009
[15] Analysys Mason, cited in Ofcom, *Impact of Strategic Review of Telecoms*, 2009.
[16] Ofcom, *Impact of Strategic Review of Telecoms*, 2009
http://www.ofcom.org.uk/telecoms/btundertakings/impact_srt/impact_srt_fulldoc.pdf

2.18 Unlike internet services there has been relatively little change in respect of fixed voice since the last market review. The proportion of residential households using fixed voice services fell slightly from 90 per cent in 2004 to 87 per cent in 2009.[17] However, more fixed voice services are now being provided by operators other than BT, using BT wholesale inputs including full LLU.

WLA operators and infrastructure

2.19 In terms of operators and the infrastructure they use to supply WLA-based services, the main development since the last review has been the merger of ntl's and Telewest's cable networks in 2006, leading to the creation of Virgin Media, and the upgrade of Virgin Media's network using NGA technology[18], which was completed in 2009. This has allowed Virgin Media to offer high speed broadband services unavailable elsewhere.

2.20 As yet, we have not seen a comparable upgrading of the copper access networks operated by BT and KCOM, with the main development being, in the case of BT, the necessary investment required to support LLU services. However, BT has now begun to deploy its NGA network (see paragraphs 2.9-2.10 above).

The Regulatory Framework for market reviews

2.21 The regulatory framework that applies to the issues covered in this document is discussed in detail at Annex 5. This framework is based upon a number of EU Directives, which have been implemented into UK law by the Communications Act 2003, which sets out our duties and obligations as they apply in the UK.

2.22 The Act also sets out other duties, such as our general duties to further the interests of citizens in relation to communications matters and the interests of consumers in relevant markets, where appropriate by promoting competition. We discuss and apply these duties and obligations in this document.

2.23 A market review normally has three stages:

- Definition of relevant markets (market definition);
- Assessment of competition in each market, in particular whether any undertakings have SMP in a given market (market analysis); and
- Assessment of appropriate regulatory obligations where there has been a finding of SMP (remedies).

2.24 The regulatory framework requirements for each stage of this market review are considered in more detail in Annex 5. Some of the main documents of which we have taken account in developing our proposals are:

[17] Ofcom, *Consumer Experience*, 2009.
[18] Specifically, DOCSIS 3.0 technology.

- On market definition, the European Commission's ("the Commission") Recommendation on relevant product and services markets ("the Recommendation on Markets")[19];
- On market analysis, the Commission's guidelines[20]; and
- On remedies, Common Positions produced by the European Regulators Group ("ERG")[21]; and
- the Commission's draft Recommendation on regulated access to Next Generation Access Networks ("the draft NGA Recommendation"), taking into account that it has not yet been formally adopted.

2.25 The current regulatory framework was amended in December 2009 by the EU 'Better Regulation' Directive. That Directive is due to be applied in the UK by no later than 26 May 2011. Where appropriate, we have taken into account these amendments to the regulatory framework.

Current regulation in the WLA market

2.26 In this market review, we consider whether current regulations in this market should be maintained, amended or removed, and whether additional regulations are necessary. Some of the key current remedies on BT (in the UK excluding the Hull Area) are:

- Local loop unbundling (LLU), whose charges are also controlled;
- Sub-loop unbundling (SLU);
- Providing access to its network on reasonable request;
- Not discriminating unduly between different CPs;
- Having charges for its regulated WLA products that relate to their costs; and
- Various measures to require transparency about the WLA products that they offer, the terms involved, any changes to them, and quality of service.

[19] Commission Recommendation of 17 December 2007 2007/879/EC, OJ L344, 28.12.2007, p.65: http://eur-lex.europa.eu/LexUriServ/site/en/oj/2007/l_344/l_34420071228en00650069.pdf and also the accompanying Explanatory Note, *Commission Staff Working Document, Explanatory Note to the Commission Recommendation on Relevant Product and Service Markets within the electronic communications sector susceptible to ex ante regulation in accordance with Directive 2002/21/EC of the European Parliament and of the Council on a common regulatory framework for electronic communication networks and services (Second edition)* (http://ec.europa.eu/information_society/policy/ecomm/doc/library/proposals/sec2007_1483_final.pdf)

[20] Guidelines for market analysis and the assessment of SMP - see http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:C:2002:165:0006:0031:EN:PDF

[21] Revised ERG Common Position on the approach to Appropriate remedies in the ECNS regulatory framework, May 2006 & ERG Common Position on Best Practice in Wholesale Unbundled Access (including shared access) Remedies, June 2007 - see http://erg.eu.int/doc/meeting/erg_06_33_remedies_common_position_june_06.pdf and http://www.erg.eu.int/doc/publications/erg_06_70_rev1_wla_cp_6_june_07.pdf

2.27 The current obligations on KCOM in the WLA market exclude LLU or SLU, and there are some differences in the transparency measures, but otherwise KCOM shares the above remedies (albeit in the Hull area only).

A forward look at market developments

2.28 Rather than just looking at the current position, market reviews look ahead to how competitive conditions may change in future[22]. Our evaluation of the current market takes into account past developments and evidence. Then we assess whether any lack of effective competition is durable, by considering expected or foreseeable market developments over a reasonable period in the future.

2.29 The actual period used for this forward look should reflect the specific characteristics of the market and the expected timing for the next review. In this market review, we have looked at potential developments over the next four years.

2.30 In this market, the key anticipated change over the next four years is that a significant amount of NGA infrastructure will be deployed. This will support super-fast broadband services, offering higher speeds than have been experienced so far by UK consumers. However, there is uncertainty about the extent and timing of NGA investment. This makes it harder to foresee how the existing competitive conditions will change over the next few years. It is possible that the WLA market will change quickly in the future, for example as the speed of NGA deployment picks up.

2.31 However, based on past data and the information before us, we are of the view that competitive and technological developments in the UK are not expected to materially affect our proposed market definitions within a four year period. For example, Virgin Media's footprint is expected to remain at around half of UK homes[23]. Also, we anticipate that most of the services on BT's network (which currently has 84 per cent of access lines[24]) will continue to be provided over its current copper network, which is expected to remain in use as new fibre infrastructure is added.

2.32 We also consider a four year forward look to be reasonable in this case as this period provides a reasonable degree of regulatory certainty to stakeholders in the UK. Such certainty is especially valuable at this point in time as it provides the right context for investment decisions during this important early phase of NGA deployment, in which the future market for NGA services is not yet clear. We note that there is greater emphasis in the new framework on promoting investment objectives, including NGA investment.

2.33 The four year forward look that we have used allows for the possibility of our next WLA market review taking place on that timeframe. However, given the potential impact of NGA deployments in this market in the next few years, we will monitor closely the WLA market, and we will consider the timing of the next market review accordingly. In doing this, we will consider the new procedures and timeframes for conducting market reviews introduced by the amendments to the EU regulatory framework. Those requirements will apply in the UK from 26 May 2011.

[22] See Annex 5 on the market review process
[23] Virgin Media's current 46% coverage will increase by a few per cent, based on its plans to add 0.5 million homes to its fibre network, which currently passes 12.6 million homes. Virgin Media also has identified more than a million homes that could get benefit from broadband over telegraph poles.
[24] In the UK excluding the Hull Area

Structure of this document

2.34 The rest of this document is structured as follows:

- Section 3 covers our proposals for market definition;
- Section 4 covers our proposals on the assessment of market power;
- Sections 5-9 cover the market power remedies that we propose to apply;
- Section 10 summarises next steps, including on implementation of SMP remedies;
- Annexes 1-4 concern the process for responding to this consultation;
- Annex 5 describes the legal framework for conducting this market review;
- Annexes 6-7 are the formal legal Notifications of our proposals;
- Annex 8 is our analysis of the retail product market definition;
- Annexes 9 and 10 provide detailed analyses of the viability of sub-loop unbundling and physical infrastructure access respectively;
- Annex 11 describes our proposed requirements for a BT reference offer on physical infrastructure access; and
- Annex 12 is a glossary of specialist terms used in this document

Section 3

Market definition

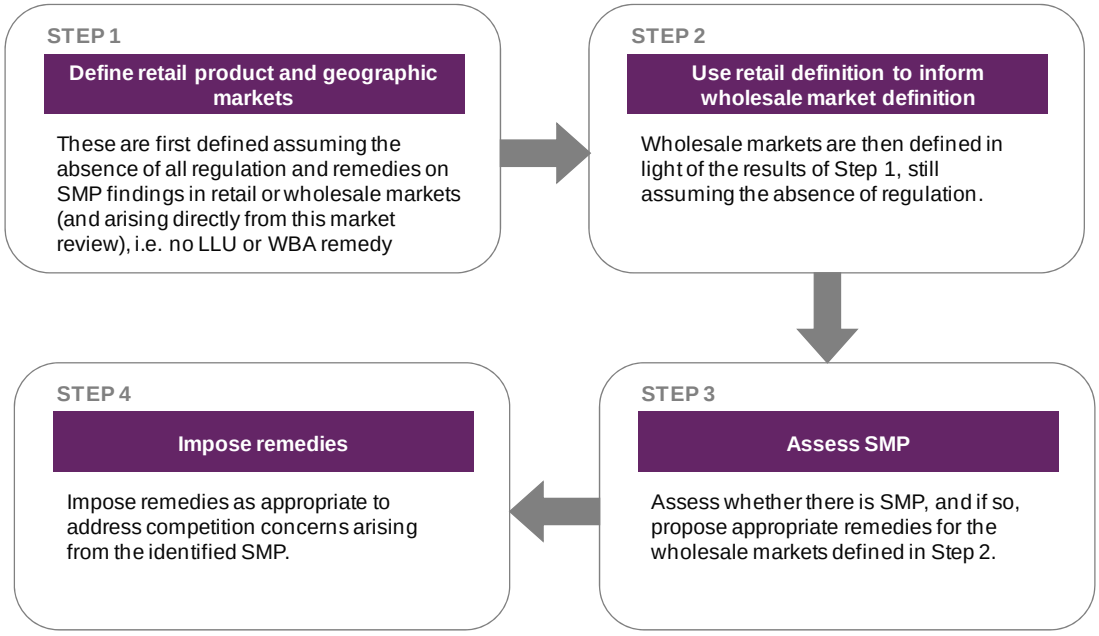
Introduction

3.1 The purpose of this section is to define the relevant wholesale markets in which the assessment of market power will be undertaken. The structure of this section is as follows:

- Description of various products relevant to this market review;
- Outline and discussion of general approach to market definition consistent with that of the Commission;
- Consideration of relevant retail markets as they are logically prior to and affect wholesale markets; and
- Definition of wholesale markets.

3.2 This methodology is illustrated in Figure 3.1.

Figure 3.1 Diagrammatic representation of market definition approach



3.3 Once the relevant analysis of SMP and remedies is considered and proposed at the wholesale level, it then follows that the retail market should be defined, taking appropriate account of remedies that have been proposed at the wholesale level.

Market definitions in the last WLA market review

3.4 We last concluded a review of the WLA market in a statement in December 2004 ("the 2004 WLA Statement")[25], when we concluded that the product market consisted of:

- loop-based and cable-based local access provision

3.5 In that review we concluded that the market did not include fibre, mobile and fixed wireless local access connections but covered the supply to both residential and business customers, and included lines which are used for analogue, integrated services digital network ("ISDN") and private circuit local ends.

3.6 We also considered the extent to which different competitive conditions existed in different geographic locations and concluded that there were two distinct geographic markets:

- The Hull Area (those areas covered by exchanges where KCOM is the only operator); and
- The UK excluding the Hull Area.

Product description

Network access products

3.7 A telecommunications network can typically be divided into three parts: access, backhaul connections and core networks. The access network (often referred to as 'the last mile') establishes the connection between the end user's premises and the first network aggregation point. The capacity of the connections offered in this part of the network can be either dedicated or shared.

3.8 Telecommunications services are aggregated as they traverse the first aggregation node and are then sent across a backhaul connection to a core network node. The core network is the part of the network that carries different services such as voice and data around the country/world and is characterised by a smaller number of network nodes compared to access nodes.

Copper versus cable

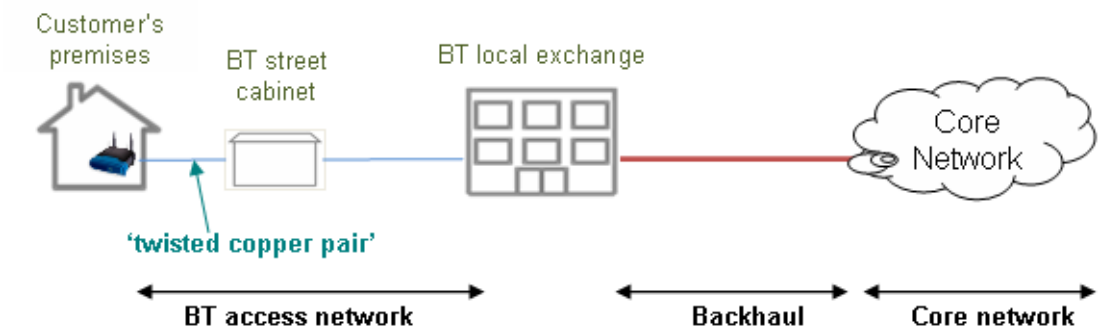
3.9 At present Virgin Media and BT have two distinct fixed access networks with different characteristics. End users can access BT's first network aggregation point (the local exchange) with dedicated local loop connection (running on copper pairs). Virgin Media's network has an access segment capacity running on coaxial cables to its aggregation node (the hub site) with neighbouring premises (depending on the network access coverage topology). Currently Virgin Media does not offer a wholesale access product.

3.10 BT's access architecture is illustrated in Figure 3.2. It comprises, in most cases, a distribution point (commonly called 'street cabinet') between the customer's premises and BT's local exchange. Street cabinets are closer to end users' premises than local exchanges and simply function as passive termination points and no service

[25] Ofcom, "Review of the wholesale local access market", December 2004. http://www.ofcom.org.uk/consult/condocs/rwlam/statement/

aggregation takes place at the street cabinet level. A number of street cabinets are connected to a BT's local exchange[26] by means of point to point connections.

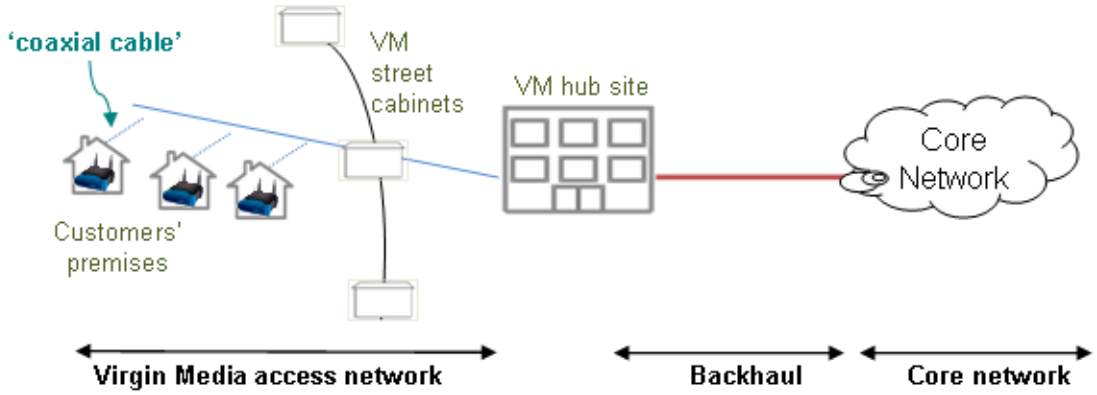
Figure 3.2 BT's fixed access network



3.11 The copper network is the traditional means for connecting subscriber premises, and copper forms the basis of the public switched telephone network ("PSTN"), which is used to carry voice and data. In addition, copper wires can also be used to carry traffic through the use of ISDN and digital subscriber line ("DSL") technologies at each end of the copper line.

3.12 Virgin Media's cable network architecture shown in Figure 3.3. It also comprises street cabinets between access network segments and the hub site. A number of cable street side cabinets connect to a Virgin Media's hub site, often by means of ring topology connections.

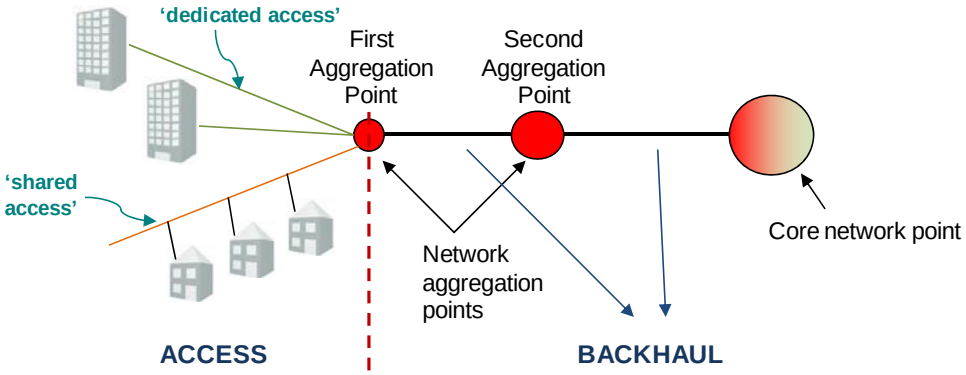
Figure 3.3 Virgin Media's fixed access network



3.13 Figure 3.4 show the different fixed access topologies: dedicated access connections to the office buildings and shared access connections to the households from the first network aggregation point.

[26] There are copper pair connections that connect directly to a local exchange.

Figure 3.4 Dedicated versus shared access



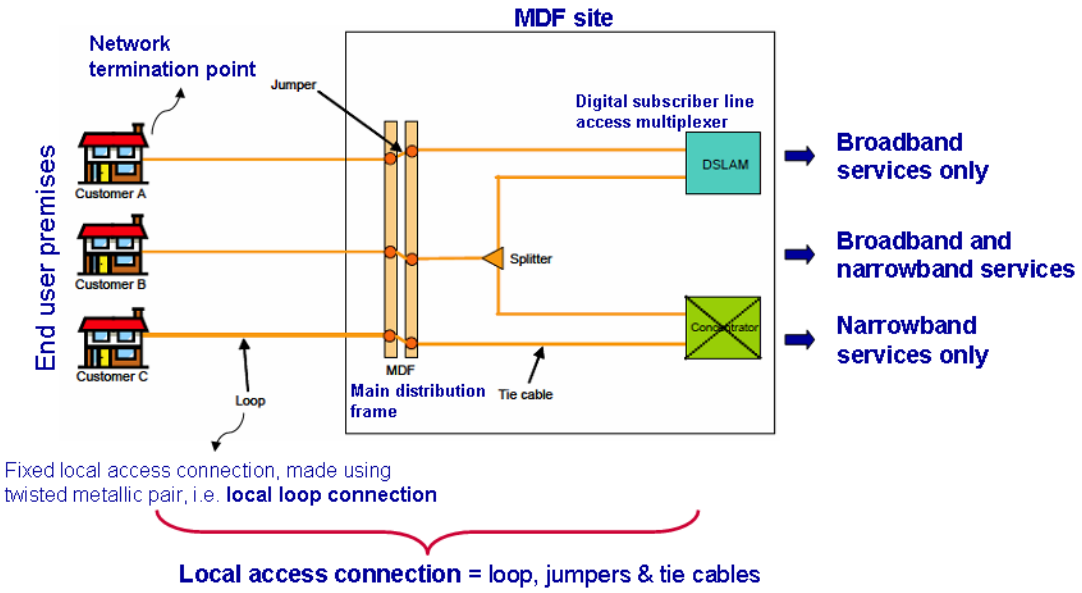
Local access network

3.14 The fixed local access connection to the majority of end user premises is currently made using a twisted metallic pair, i.e., a local loop connection. This runs from the network termination point at an end user's premises to a main distribution frame ("MDF") at a MDF site. An individual loop is connected to an operator's equipment, such as a Digital Subscriber Line Access Multiplexer ("DSLAM") or concentrator equipment, within the MDF site, using flexible jumpers and tie cables.[27] The combination of loop, jumpers and tie cables which completes a local access connection, together with any supplementary services associated with providing the connection, is the focus of this review.

3.15 Local access connections, comprising local loops, flexible jumpers, and tie cables, are illustrated in a range of configurations in Figure 3.5. For Customer A, the local access connection is made with DSLAM equipment that provides a broadband-only service[28] For Customer B, the local access connection supports both broadband and narrowband services. For Customer C, the local access connection is used to support narrowband-only services.[29]

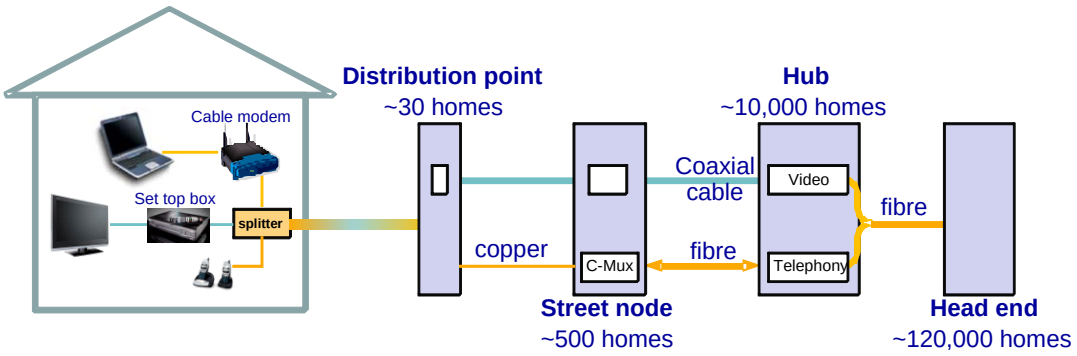
[27] In a small number of cases, the metallic loop connection to an end user within BT's network ends at the PCP (roadside cabinet), with onward connection made over fibre. DSL-based broadband services cannot be provided over fibre.
[28] In practice, all ISPs require an active phone line in place before connecting a customer to its broadband service.
[29] As of December 2008, 99.98% of the UK households is connected to a DSL-enabled exchange allowing these customers to access both broadband and narrowband services over their telephone line. http://www.ofcom.org.uk/research/cm/cmrnr09/charts/

Figure 3.5 Illustration of BT's local access network connection



3.16 Virgin Media's cable network uses both coaxial cable and copper pairs for the final connection to the end user premise (see Figure 3.6). A hybrid fibre/coaxial cable is used for the TV network and hybrid fibre/copper pairs are used for telephony. A primary multiplexer is installed in the street node so that signals on copper pairs can be digitally multiplexed onto optical fibre.

Figure 3.6 Illustration of Virgin Media's network connection



3.17 The local access connections described above also apply to business premises. However, in some cases businesses may want dedicated transmission capacity from the local serving exchange to their premises. Such connections can be linked via copper or fibre optic pair local ends. These are often referred to as 'retail leased lines', and also carry both voice and data traffic.

Alternative forms of local access connections

3.18 Our assessment will also consider the extent to which alternative means of connection between the network operator and the end user represent effective substitutes for local access services provided over copper local loops.

3.19 Virgin Media's network uses cable connections which consist of Siamese cables, which combine traditional twisted metallic pairs with coaxial cable capable of supporting high bandwidth television and broadband delivery. In principle, these cable connections are able to offer a number of options for supporting broadband and narrowband communications. For instance, broadband services could be provided either over the coaxial cable, as is currently the case, or in theory, using DSL technology over the twisted metallic pairs.

3.20 As broadband services become more bandwidth demanding, telecommunication networks are moving to NGA, promising to offer very high speeds to the end customers. The bandwidth offered by the current technologies based on copper access infrastructure is limited by the length and the quality of the copper loop. A promising and future proof solution to overcome this limitation is the replacement of the copper links by optical fibres.

3.21 Fibre optic cables use lasers to transmit pulses of light down very fine strands of silicon. The higher the frequency of a signal, the more information it can carry. Since light uses higher frequencies, fibre optic cable can carry thousands of times more data than either electric signal or radio waves. Compared to electrical (or copper) transmission, optical fibre is also lightweight and free from electromagnetic interference. Fibre optics can theoretically provide nearly unlimited bandwidth potential depending on how close the fibre is brought to the end user.

3.22 There are two main types of fibre deployment: extending from the operator's network to the first point of aggregation closer to the customer (FTTC), or to the customer's premises (FTTP):

- FTTC describes the case where optical fibre is deployed from the local exchange or hub site to the street cabinet. Existing access cables (either twisted copper pair or coaxial cable) continue to be used to connect the cabinet to the customer's premises; and

- FTTP, on the other hand, can deliver the full benefits from the use of optical fibres to the end user by extending the fibre connectivity up to the customer's premises.

3.23 The roll-out of High Speed Packet Access ("HSPA")[30] has enabled mobile operators to offer broadband access to consumers. This can be provided via USB dongles that connect directly into laptops and desktops and allow immediate online access. It can also be provided via mobile broadband routers that act as a wireless network, allowing different devices to share the internet connection. There is evidence amongst some groups of consumers substituting this for fixed line broadband access. In addition, future developments such as 4G (LTE) technology[31] could mean that mobile broadband play an increasingly prominent role in the household for voice and data access if more people substitute all fixed telecommunications services for mobile.

[30] HSPA combines high speed downlink packet access (HSDPA) and high speed uplink packet access (HSUPA). HSDPA is an enhanced 3G protocol (sometimes known as 3.5G), and the majority of deployments provide up to 7.2 Mbit/s in the downlink. HSUPA is a similar upgrade to enhance uplink speeds up to 2 Mbit/s.

[31] The Long Term Evolution is the next major step in mobile radio communications, and is a 4th generation (4G) mobile broadband standard aimed to be the successor to the 3G technologies. The specification provides downlink peak rates of at least 100 Mbit/s, an uplink of at least 50 Mbit/s and reduced latency between the user equipment and the base station.

3.24 The main technology used to provide fixed wireless access is Worldwide Interoperability for Microwave Access ("WiMAX") which provides wireless transmission of data using a variety of transmission modes, from point-to-multipoint links to portable and fully mobile internet access (within the coverage area of the WiMAX signal). WiMAX can provide up to 10 Mbit/s broadband speed without the need for cables and therefore can be considered as an alternative to cable and DSL.

3.25 Satellite broadband is similar in the way it works to Sky digital TV, i.e., it utilises a satellite to transmit the data and a receiver to receive the data. There are a number of broadband satellite access providers in the UK and is typically marketed as a solution where there is no Asymmetric DSL ("ADSL") or cable broadband service available. Coverage is available anywhere in the UK including the Channel Isles and the Scottish Islands. It is now possible to get small business systems that closely emulate ADSL, along with more dynamic low latency systems that support advanced broadband applications like virtual private networks ("VPNs"), Voice over Internet Protocol ("VoIP") and video conferencing.

3.26 Each of these is explored in detail when we consider the WLA product market definition.

Retail services supported over access lines

3.27 There are a number of retail services that can be supported over an access line:

- Narrowband services, i.e., voice telephony and dial-up internet access;
- Broadband services; and
- Retail leased line services for businesses.

Narrowband services

3.28 Most local access connections continue to be used to support narrowband voice telephony and internet access using a dial-up modem with data transfer speeds of up to 56 kbit/s. Simultaneous data and voice communication is not possible using a single narrowband-only connection.

Broadband services

3.29 A broadband internet service has three distinct characteristics: it is always-on, provides the end user with higher data transfer speeds compared with a dial-up connection and enables narrowband voice and broadband data to be carried simultaneously. While a broadband service is most often used to provide high-speed data communication, it can also be used to provide voice communication, via voice-over-broadband technologies.

3.30 There are two aspects of the technologies used to deliver asymmetric broadband access services to end users on BT's local loops. DSL is a family of technologies that provides digital data transmission over the wires of a local telephone network. Coupled with the underlying copper network, retail broadband services can be delivered at different data speeds.

3.31 Current generation broadband access using ADSL technology has been behind the common "up to 8 Mbit/s" speed broadband packages. Potential speeds of different

DSL technologies are set out in Figure 3.7. For ADSL, a speed of around 3.7 Mbit/s[32] is more likely to be achieved. The speed depends on the time of day, quality of the copper loop and the distance between the end user premises and the local exchange. Average speeds achieved by Virgin Media's cable broadband customers is over 8 Mit/s, partly due to higher theoretical maximum speeds available on coaxial cables which do not slow down the further away end user premises are from the hub site. At these speeds current high bandwidth requirement services such as standard definition video on demand (which requires at least 3 Mbit/s) can be accessed by most end users.

3.32 As ADSL popularity grew, a new family of standards known as ADSL2 were developed. ADSL2 extends the capability of basic ADSL in data rates to 12 Mbit/s downstream and 3.5 Mit/s upstream. ADSL2+ allows even higher downstream data rates to be achieved, but the higher frequency used means that beyond 3km or 4km away from the exchange speeds are unlikely to be any faster than ADSL.

3.33 VDSL (very high bit-rate DSL) is another DSL technology which provides faster data transmission over a single flat untwisted or twisted pair of copper wires. It can offer up to 52 Mbit/s but only over even shorter distances compared to ADSL. VDSL2 is the newest and most advanced standard of DSL technology. It deteriorates quickly from a theoretical maximum of 250 Mbit/s at 'source' to 100 Mbit/s at 0.3 km and 50 Mbit/s at 1 km. Starting from 1.6 km its performance is equal to ADSL2+.

Figure 3.7 Maximum theoretical speeds of DSL technologies

Technology	Max. upstream capacity	Max. downstream capacity	Max. distance	Downstream capacity @ max. distance	Frequency range
ADSL	640 kbit/s	12 Mbit/s (0.3km)	5.4km	1.5 Mbit/s	Up to 1.1 MHz
SDSL	3 Mbit/s	3 Mbit/s	2.7km	2 Mbit/s	Up to 1.1 MHz
ADSL2+	1 Mbit/s	26 Mbit/s (0.3km)	3.6km	4 Mbit/s	Up to 2.2 MHz
VDSL	16 Mbit/s	52 Mbit/s (0.3km)	1.3km	13 Mbit/s	Up to 12 MHz
VDSL2	100 Mbit/s	100 Mbit/s (0.3km)	3.6km	4 Mbit/s	Up to 30MHz

3.34 The development of broadband has facilitated significant changes in the bandwidth requirements of services available online, from the low-bandwidth activities such as email and web browsing to applications that require higher bandwidths such as video streaming and interactive gaming.

3.35 We commissioned consumer research for this market review[33], which showed that consumers use a wide range of online applications. Customers with broadband internet access at home tend to go online daily (78 per cent of respondents), with 14 per cent going online weekly and 2 per cent monthly. Amongst those who are online

[32] http://www.ofcom.org.uk/research/telecoms/reports/broadband_speeds/
[33] Ofcom, "Consumer research into use of fixed and mobile internet", March 2010 – published on our website as a link from this consultation document

everyday many carry out high bandwidth activities such as voice and video communication (e.g., via Skype), downloading and uploading content and watching live or catch-up TV.

3.36 TV services delivered over internet such as BBC's iPlayer have been enabled by internet access and broadband technologies. This was most commonly accessed using computers, but since early 2008 online content has been available for viewing on TV using game consoles. By early 2009 TV manufacturers such as Sony, Samsung and Panasonic had also started introducing their own technology to bring the internet directly to TV sets using built-in Ethernet ports.

3.37 The speeds achieved by CGA networks are able to cope with the bandwidth requirements of these services although consumer experiences vary. In the future, higher residential bandwidth requirements will be driven by:

- home networking which connects multiple TVs, computers, game consoles and other multimedia devices (such as personal video recorders, PVRs) together;
- increasing ownership of multiple devices in the home; and
- increasing availability of built-in WiFi and Ethernet chipsets in devices.

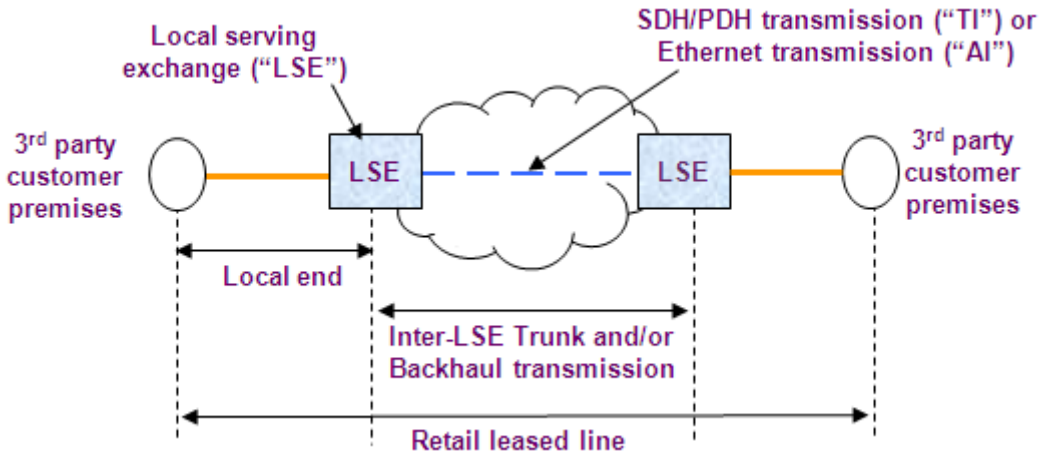
3.38 For example, streaming high definition content in the living room on a TV at the same time as on a computer in the bedroom during the evening peak times would require at least a 30 to 40 Mbit/s connection, most likely higher to take into account contention with other users and distance from the exchange. The delivery of such services necessarily depends on the availability of next generation broadband access.

Retail leased lines services

3.39 The setup of retail leased lines is illustrated in Figure 3.8. Such lines can also be used to build private enterprise networks linking various company sites to enable all types of communications within an organisation.

3.40 Business demand for bandwidth is also likely to increase in the future, for example as a result of increasing use of centralised file hosting and file sharing, such as via VPNs.

Figure 3.8 Illustration of a retail leased line



3.41 VPNs have become increasingly popular amongst many companies to accommodate the needs of remote employees and distant offices using a public network (usually the internet). Instead of using a dedicated, real-world connection such as leased line, a VPN uses "virtual" connections routed through the Internet from the company's private network to the remote site or employee. The widespread take up of broadband at home has meant that employees are able to work together without being restricted by their physical locations. Similarly, businesses are able to extend their geographic connectivity, provide additional networking opportunities and reduce operational costs compared to traditional wide area networks (WANs) using leased lines or ISDN technologies.

3.42 Other factors that increase business bandwidth requirement are:

- video conferencing between offices;
- remote monitoring and surveillance; and
- improved online presence and supply-side management

3.43 The bandwidth requirements for these types of services are likely to be similar to those identified for residential customers.

Services delivered over NGA networks

3.44 CGA networks using existing copper loop or cable network support today's voice and data services simultaneously. Significant developments in cable and DSL technologies have allowed higher bandwidths to be delivered over these networks compared to the traditional narrowband services. However, they do have speed limitations which will restrict the type of services that can be delivered across them.

3.45 In our November 2006 document[34], NGA is defined as:

[34] Ofcom, Regulatory challenges posed by next generation access networks, November 2006. http://www.ofcom.org.uk/research/telecoms/reports/nga/

> "broadband access services that are capable of delivering sustained bandwidths significantly in excess of those currently widely available using existing local access infrastructure or technologies".

3.46 This general definition encompasses the delivery of broadband by different technologies and architectures, such as fibre deployments (e.g., FTTC and FTTP), upgrades to cable, terrestrial fixed or mobile wireless services, as well as improvements to current broadband services (e.g., VDSL).

3.47 Fibre deployment to the premise can deliver the full benefits from the use of optical fibres to the end user by extending the fibre connectivity up to the customer's premises. However, the practical limitations of this NGA structure are the significant civil works and high technology investment costs involved.

3.48 On the other hand, fibre to the cabinet (FTTC) continue to use existing access cables (either twisted copper pair or coaxial cable) connecting from the cabinet to the customers' premises. Since the final loop connection between the street cabinet and the end user is still copper, the use of DSL technology is still necessary. However, with the shorter loop lengths, i.e., from the street cabinet to the end user premise rather than from the local exchange, the use of more advanced DSL technologies such as VDSL2 is possible.

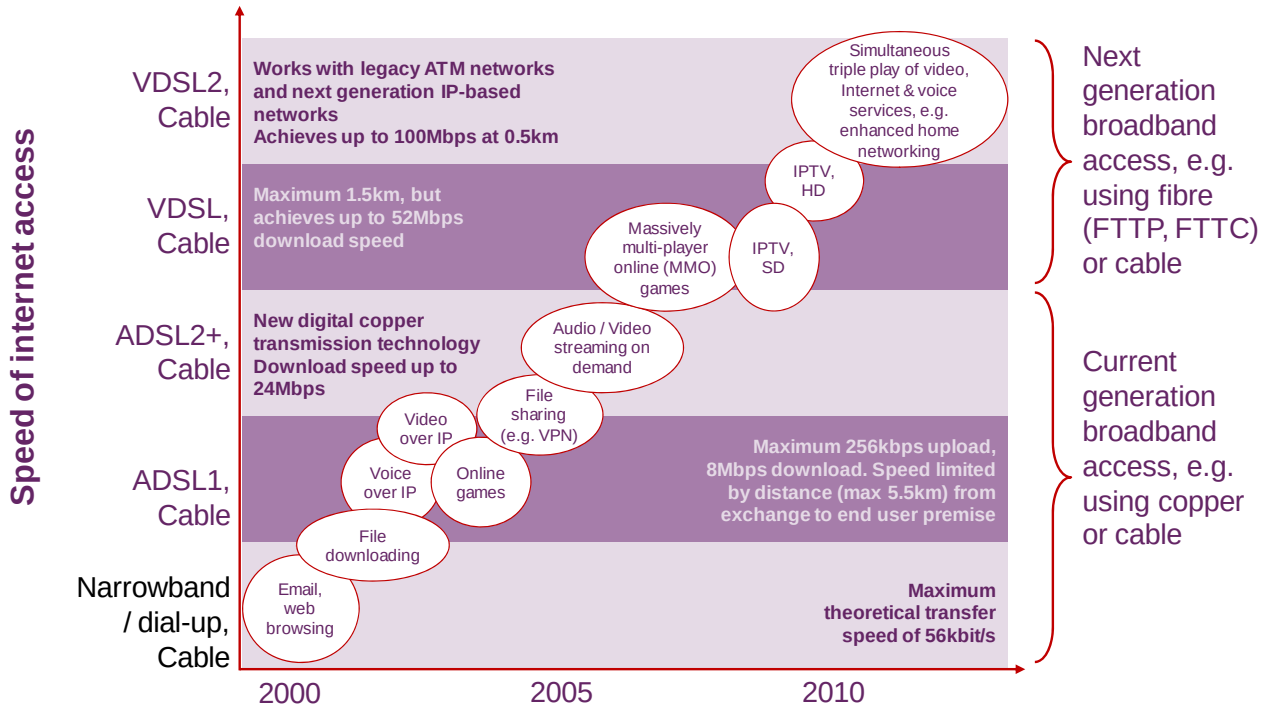
3.49 Technically FTTC and advanced DSL technologies such as VDSL2 are a very attractive combination as VDSL2 can manage speeds of 50 Mbit/s on lines that are 1km long between the end user premises and street cabinets and 100 Mbit/s at a distance of 0.5km, with performance degrading as the loop attenuation increases. Therefore in order to offer VDSL to a significant proportion of the population the DSLAMs need to be relocated to street cabinets (i.e., closer to the subscriber) and fibre feeds installed to the street cabinets.

3.50 With FTTP, fibre aggregation takes place at the local exchange or hub site level, therefore offering larger catchment area. With FTTC, the catchment area is typically smaller because one or more street cabinets typically connect to a local exchange. Nationally, there are around 90,000 cabinets, compared to around 5,600 local exchanges.

3.51 In the short to medium term, providers already using LLU have connected their customers' phone lines directly into their network at unbundled exchanges. This bypasses BT's core network and enables them to provide ADSL2+ lines, which offers speeds of up to 24 Mbit/s. At these speeds, it is possible to deliver current requirements of high definition TV (HDTV) streaming (which requires around 15 to 20 Mbit/s), massively multi-player online (MMO) gaming and other interactive applications.

3.52 Figure 3.9 illustrates the types of services that could be delivered by current and next generation broadband access.

Figure 3.9 Services enabled by current and next generation broadband access



Approach to market definition

3.53 There are two dimensions to the definition of a relevant market: products to be included in the same market and the geographic extent of the market. As such it is often practical to define the relevant product market before exploring the geographic dimension of the market. Our approach to market definition follows the methodology taken in the 2004 WLA market review and our last review of the WBA market in 2008 ("the 2008 WBA market review")[35] and is consistent with those used by UK[36] as well as European and US competition authorities.

Commission's Recommendation on Markets and SMP Guidance

3.54 In 2002, the Commission issued its *Guidelines on Market Analysis and the Assessment of Significant Market Power under the Community Regulatory Framework for Electronic Communications Networks and Services*[37] ("the SMP Guidelines").

3.55 In 2003, the Commission issued its *Recommendation on relevant product and services markets*[38] identifying product and service markets within the electronic communication sector in which *ex ante* regulation may be warranted. The

[35] *Ofcom, Review of the wholesalebroadband access markets, May 2008*. http://www.ofcom.org.uk/consult/condocs/wbamr07/statement/
[36] *Office of Fair Trading, Market Definition –Understanding Competition Law, OFT 403*, December 2004. http://www.oft.gov.uk/shared_oft/business_leaflets/ca98_guidelines/oft403.pdf
[37] Commission Recommendation 2002/C165/03, OJ C165, 11.7.2002, p.6
[38] Commission Recommendation of 11 February 2003 2003/311/EC, OJ L114, 8.5.2003, p.45.

Commission revised the Recommendation in December 2007, reducing the number of markets on the list[39].

3.56 In formulating our proposals, we have taken utmost account of the Recommendation on Markets (together with the Explanatory Memorandum ("EM")[40]) and the SMP Guidelines. Where appropriate, we have also considered the draft NGA Recommendation, taking into account that it has not yet been formally adopted.

3.57 The WLA market is listed at point 4 of the Annex to the Recommendation on Markets as follows:

> "Wholesale (physical) network infrastructure access (including shared or fully unbundled access) at a fixed location."

The Recommendation on Markets also lists the WBA market at point 5 of the Annex as follows:

> "This market comprises non-physical or virtual network access including 'bitstream' access at a fixed location. This market is situated downstream from the physical access covered by market 4 listed above, in that wholesale broadband access can be constructed using this input combined with other elements."

3.58 Our approach to market definitions, as set out below, is consistent with the approach set out in the Recommendation on Markets and the SMP Guidelines, taking into account in particular:

- Recital (4) of the Recommendation on Markets, which clearly states that the starting point for market definition is a characterisation of the retail market over a given time horizon, taking into account the possibilities for demand and supply side substitution. The wholesale market is identified based on this retail market. This approach is repeated in section 2.1 of the EM, which also states that, because any market analysis is forward–looking, markets are to be defined prospectively taking account of expected or foreseeable technological or economic developments over a reasonable horizon linked to the timing of the next market review;

- Section 2.1 of the EM, which states that market definition is not an end in itself, but a means to assessing effective competition for the purposes of ex ante regulation. We adopted an approach by which this consideration is at the centre of our analysis. The purpose of market definition is to illuminate the situation with regard to competitive pressures. For example, our approach to supply side substitution explicitly identifies as the key issue the question of whether additional competitive constraints on pricing are brought to bear by additional suppliers entering the market. So, the key issue is not the market definition for its own

[39] Commission Recommendation of 17 December 2007 2007/879/EC, OJ L344, 28.12.2007, p.65: http://eur-lex.europa.eu/LexUriServ/site/en/oj/2007/l_344/l_34420071228en00650069.pdf and also the accompanying Explanatory Note, *Commission Staff Working Document, Explanatory Note to the Commission Recommendation on Relevant Product and Service Markets within the electronic communications sector susceptible to ex ante regulation in accordance with Directive 2002/21/EC of the European Parliament and of the Council on a common regulatory framework for electronic communication networks and services (Second edition)* (http://ec.europa.eu/information_society/policy/ecomm/doc/library/proposals/sec2007_1483_final.pdf)

[40] http://ec.europa.eu/information_society/policy/ecomm/doc/library/proposals/sec2007_1483_final.pdf

sake, but an identification of the extent and strength of competitive pressures; and

- Section 4 of the EM, which states that wholesale markets should be examined in a way that is independent of the infrastructure being used, as well as in accordance with the principles of competition law. Again this approach is key to our analysis. Our approach is based on a competition law assessment of markets and an assessment of the extent to which switching among services by CPs constrains prices, irrespective of the infrastructure used by the providers of those services.

3.59 We have given careful consideration to the Recommendation on Markets, the EM, the SMP Guidelines and the draft NGA Recommendation and we consider that the market definitions which we propose below are consistent with the approach set out in those documents.

General approach to market definition

3.60 As noted above, the EM makes clear that the market definition exercise of the market analysis *"is not an end in itself, but a means to an end*". Market definition aids the assessment of whether end users of a product are protected by effective competition and so whether there is a requirement for the imposition of ex ante regulation. It is in this light that we have conducted the market definition in this review.

3.61 There are two dimensions to the definition of the relevant market: the relevant products to be included within the market and the geographical extent of that market. Market boundaries are determined by identifying constraints on the price-setting behaviour of firms. There are a number of competitive constraints to consider:

- Demand-side and supply-side substitution;
- Common pricing constraints; and
- Homogeneous competitive conditions.

Demand-side and supply-side substitution

3.62 To identify constraints on firms' price-setting behaviour, two of the main competitive constraints to consider are:

- how far it is possible for customers to substitute to other products or services for those in question (demand-side substitution); and
- how far suppliers could switch, or increase, production to supply the relevant products or services (supply-side substitution) following a price increase.

3.63 Demand-side substitution analysis considers whether products of similar functions but of a different price/quality should be included in the same market as one under investigation. For example, if one is of a higher quality and therefore more expensive, the question is whether its price is constrained by the lower quality product/service. That is, customers might switch to the higher quality product if the price of the lower quality product increased to a point where consumers feel that the price differential justifies opting for the higher quality product.

3.64 Extending this reasoning, it follows that the product market definition may extend to a wide range of price/quality offerings based on the "chain of substitution"[41] between intermediate products/services within this range.

3.65 Supply-side substitution possibilities are examined to assess whether other potential market players provide any additional constraints on the pricing behaviour of the hypothetical monopolist which have not been captured by the demand-side analysis. For this to be relevant, suppliers must not be currently providing the product/service in question but must be able to enter the market quickly and at low cost by virtue of their existing position in the supply of other products or areas such that they place additional competitive constraint on the supply of the service in question. This means that the supplier would already own all the assets (e.g., production, distribution and marketing) needed to produce the product/service in question.

3.66 Suppliers who are already present in the provision of demand-side substitutes, by definition, are already in the market and the threat of entry does not provide additional competitive constraint on the hypothetical monopolist. Nonetheless, the impact of expansion by such suppliers can be taken into account in the assessment of market power.

3.67 The hypothetical monopolist test ("HMT") is a useful tool to identify close demand-side and supply-side substitutes. A product is considered to constitute a separate market if a hypothetical monopoly supplier could impose a small but significant, non-transitory price increase ("SSNIP") above the competitive level without losing sales to such a degree as to make this unprofitable. If such a price rise would be unprofitable the market definition should be expanded to include the substitute products. The OFT Guidelines on Market Definition[42] normally considers a price five to ten per cent above competitive levels to be 'small but significant'.

3.68 The demand-side and supply-side substitution must take place within a relatively short time period in order to be able to impose some effective competitive constraint on the hypothetical monopolist. The OFT Guidelines suggest a time period of up to 12 months as a rule of thumb, although this may be shorter for example, in industries where transactions are made very frequently.

3.69 In applying the HMT, it is standard to begin with a fairly narrow view of the relevant market and then expand that market to include effective substitutes.

Common pricing constraints

3.70 Another factor that is sometimes an additional consideration in setting market boundaries is whether there exist common pricing constraints across customers, services or geographic areas (i.e., areas in which a firm voluntarily offers its services at a geographically uniform price). Where common pricing constraints exist the geographic areas in which they apply could be included within the same relevant market even if demand-side and supply-side substitutes are not present. Failure to consider the existence of a common pricing constraint could lead to unduly narrow markets being defined.

[41] As described in OFT, "Market definition. Understanding competition law", December 2004
[42] *OFT, ibid*

Homogeneous competitive conditions

3.71 Our approach also takes into account the SMP Guidelines. In particular paragraph 56 which states that:

> *"According to established case-law, the relevant geographic market comprises an area in which the undertakings concerned are involved in the supply and demand of the relevant products or services, in which area the conditions of competition are similar or sufficiently homogeneous and which can be distinguished from neighbouring areas in which the prevailing conditions of competition are appreciably different…"*

3.72 Hence, subject to the relevant caveats above, where there are geographic areas where competitive conditions are sufficiently homogeneous the definition of the relevant geographic market will include all of those areas within one market, even if they are not linked by demand- or supply-side substitution.

Geographic market

3.73 The geographic market is the area within which demand-side and/or supply-side substitution can take place and is defined using a similar approach to that used to define the product market. In carrying out this market review, we have taken into account the guidance on geographic markets produced by the ERG[43].

3.74 On the demand-side, the objective is to identify producers located close enough so that they would constrain the behaviour of a hypothetical monopolist. If a substantial number of consumers would switch to producers in neighbouring areas then the geographic market should encompass those areas.

3.75 Chains of substitution can also be an important factor in defining geographic markets. Consumers in any one area might not be willing to travel any great distance to purchase a product. However, if there are a number of suppliers located in between the two areas, consumers' willingness to substitute areas can therefore create a competitive constraint between suppliers of similar products, creating a wider geographic market.

3.76 On the supply-side, consideration is given to whether producers can switch to supplying different areas within a relatively short period of time. As with product market such substitution should be able to occur within a relatively short period of time to present any competitive constraint.

Modified Greenfield approach

3.77 The Commission's framework for market reviews requires the adoption of a 'modified Greenfield approach'. This means that that existing SMP remedies that apply to the market under consideration, or to those downstream markets, should be set aside. That is, the analysis should be conducted under a hypothetical scenario where the relevant existing SMP regulation does not exist. As WLA is the most upstream input, for the purposes of this market review this approach requires that the impact of all SMP regulation in fixed line communications is disregarded.

[43] *European Regulators Group, ERG Common position on Geographic Aspects of Market Analysis (definition and remedies)*, October 2008.
http://erg.ec.europa.eu/doc/publications/erg_08_20_final_cp_geog_aspects_081016.pdf

3.78 In the 2004 WLA market review, this task was straightforward as LLU had yet to emerge as a significant force and broadband had not taken off. Since then, however, developments in both these areas mean that the exercise involves a much more hypothetical scenario. In order to conduct an SMP analysis certain conclusions need to be made about the effects of removing SMP legislation. As discussed further below, the analysis presented here is conducted on the basis that in the absence of SMP remedies:

- Virgin Media could, to a degree, take the place of LLU operators and expand its market share based on the demand for broadband. In other words, the growth in broadband take-up since the last market review has not been purely price driven and, absent LLU entrant, Virgin Media could have responded by making gains in its WLA share at the expense of BT;

- No new competing access networks, for example based on fixed wireless access, would be constructed; and

- Virgin Media would not expand its network footprint.

3.79 In addition we consider that the market would mainly entail BT and Virgin Media competing at the retail level, thereby providing indirect constraints on any wholesale supply. Absent a requirement to provide wholesale services, it may well be the case that BT would continue to do so owing to the ability of other firms to add value at the retail level, for example from the strength of their brand or a greater ability to provide bundled services. Virgin Media may also find this in its best interests. However, we would not expect to see the same volumes as under regulated access and the main focus of competitive pressure in the WLA market would be at the retail level.

Benchmark price

3.80 For the purposes of the SSNIP analysis and market definition, the appropriate benchmark price is the competitive price to which the hypothetical price increment is applied. If the benchmark price is above the competitive price level, then this may result in an over-estimation of the scope for substitution, resulting in an excessively broad market definition and vice versa[44].

3.81 The Commission has also stated that its "working assumption will be that current prevailing prices are set at competitive levels. If, however, a service or product is offered at a regulated, cost-based price, then such price is presumed, in the absence of indications to the contrary, to be set at what would otherwise be a competitive level"[45].

3.82 In 2005, Openreach was established to provide services to competing providers of telecommunications services on an equivalent basis. These services included LLU, which includes fully unbundled lines (metallic path facility, or "MPF") and shared

[44] The 'cellophane fallacy', named after the US case US v EI Du Pont Nemours & Co, 1956, is used to describe the fallacy of identifying competitive constraints where prevailing prices are already above the competitive level. Even a monopolist reaches a point where further price increases become unprofitable and where competitive constraints come into action that would not have applied at competitive price levels. If this is not taken into account, the erroneous conclusion could be reached that a monopolist who has successfully exercised market power by raising price is subject to competitive constraints since, starting from monopoly price levels, it would be constrained from implementing further price increases.

[45] Commission notice on the definition of the Relevant Market for the purposes of Community competition law; OJ [1997] C372/5.

unbundled lines (shared MPF, or "SMPF"). Following the 2004 WLA market review, we set the charge ceiling for BT's fully unbundled rental charges in November 2005[46]. This was updated in May 2009 with new price caps effective to the end of March 2011[47].

3.83 As these prices have been established on the basis of costs, we can reasonably assume that such prices can be used as benchmark prices in the market definition assessment.

Relationship between wholesale and retail markets

3.84 The analysis of retail market definitions is logically prior to the definition of wholesale markets. This is because demand for WLA is derived from demand for access at the retail level, i.e., the level of demand for the upstream input depends on the demand for the retail services which it supports. The principle that market power in one market may be constrained by competition in a related downstream market is well-established. Failure to consider retail level constraints could lead to incorrect conclusions regarding market power and inappropriate remedies at the wholesale level.

3.85 If the upstream input accounts for a sufficiently large proportion of the downstream price, the range of available substitutes at the downstream (retail) level will inform the likely range of substitutes for the upstream (wholesale) service. This is because a rise in the price of a wholesale service which is passed through to the associated retail service will cause retail customers to switch retail products, so reducing demand for the wholesale input.

Relevance of existing regulation

3.86 When defining downstream markets for the purpose of assessing SMP upstream, it is necessary to assume that upstream regulation is absent in the market under consideration as illustrated in Step 1 of Figure 3.1. Any finding of SMP in the WLA market may not be eliminated by regulation, but the ability to exploit an upstream-market SMP in the downstream market is controlled by it.

3.87 We have therefore considered demand-side and supply-side substitution possibilities at the retail level only if they are economically viable in the absence of SMP regulation in the market being considered. This approach is consistent with the EM.

Summary of retail product market definition

3.88 Final customers' demand for various communications services drives the demand for local access connections. As illustrated in Figure 3.5, a fixed line local access connection continues to be an integral element in the delivery of retail services such as voice telephony and data services for end users. Therefore local access products considered in this review are inherently wholesale-level products and the relevant retail markets to consider in this market review are:

[46] Ofcom, "*Local loop unbundling: setting the fully unbundled rental charge ceiling and minor amendment to SMP conditions FA6 and FB6"*, 30 November 2005. http://www.ofcom.org.uk/consult/condocs/llu/

[47] Ofcom, "*A new pricing framework for Openreach*", 22 May 2009. http://www.ofcom.org.uk/consult/condocs/openreachframework/statement/

- Fixed narrowband exchange line markets. We concluded a review of the retail markets, and most of the wholesale narrowband exchange line markets in September 2009[48];

- Asymmetric broadband access markets. We have carried out a review of the WBA market and also published the consultation proposals on that market today; and

- Retail leased lines markets. We concluded this market review in December 2008[49].

3.89 Since the relevant downstream wholesale markets provide the link between the local access connections and the retail markets, and it is therefore appropriate to first define the retail markets that lie immediately downstream of WLA. In addition, we assume the absence of upstream regulation. This means that suppliers of local loop connections, or potential substitutes, would not necessarily make local access products available at the wholesale level to third parties.

3.90 For each of the retail markets above, we have drawn on the conclusions made in order to inform our analysis of the WLA product markets. To do so, we have assumed the absence of upstream regulation. This means that suppliers of local loop connections, or potential substitutes, would not necessarily make local access products available at the wholesale level to third parties. Details of how this might affect the retail market definition are provided in Annex 8. Our proposals for the wholesale level definition are summarised below.

3.91 The market for fixed narrowband exchange lines that includes both business and residential customers. There is a separate market for fixed access and calls, with mobile access being in a separate market to fixed access. Analogue, ISDN2 and ISDN30[50] exchange lines are all in separate markets.

3.92 The WBA market includes loop-, cable- and fibre-based asymmetric broadband access serving both business and residential customers, with no speed boundary within this market. Excluded from this market definition are narrowband access, symmetric broadband access, and access using mobile, fixed wireless and satellite. In addition, the asymmetric broadband access product definition does not include all other services in a bundle of retail services (such as pay TV, mobile or fixed services). However, broadband services included in a bundle are in the same market as stand-alone broadband services.

3.93 The leased lines market consists of separate markets for traditional interface ("TI") and alternative interface ("AI") leased lines services, with different bandwidth categories within each of these markets. Leased lines markets include Symmetric DSL ("SDSL") but not ADSL services.

[48] Some specific outstanding elements of the wholesale narrowband exchange line market review (wholesale transit services and call termination) were finalised in February 2010, see http://www.ofcom.org.uk/consult/condocs/wnmr_statement_consultation/statement/statement.pdf
[49] Ofcom, "Business connectivity market review", December 2008. http://www.ofcom.org.uk/consult/condocs/bcmr08/
[50] Ofcom is conducting a further review of the retail and wholesale ISDN30 markets.

Wholesale product market definition

3.94 Having proposed definitions for the relevant retail product market we now go on to assess the relevant market at the wholesale level. At this point it is worth recalling that market definition in a means to an end and not an end in itself. The end result is that we identify the products and geographic area over which we then assess the case for imposing ex ante remedies.

3.95 As noted above, demand for WLA is derived from demand for retail services which require access. It is useful to define the scope of the relevant retail market before defining the scope of the wholesale market. Consistent with the modified Greenfield approach, we need to define the scope of the relevant market absent the imposition of SMP remedies at the level of the market being reviewed. That is, we cannot assume the presence of LLU or SLU, which are remedies already imposed as a result of previous findings of SMP in the market.

3.96 Taking these into consideration, it is likely that competition will only take place at the retail level between vertically integrated operators with an access network. This is on the basis that there is very limited (or no) examples of instances where vertically integrated operators with fixed access networks that have voluntarily offered access to potential competitors. In terms of fixed wired telecoms access, the relevant vertically integrated operators are BT and Virgin Media.

3.97 In conducting our market definition, consistent with the Commission's guidance and case law it is appropriate to begin by hypothesising a relatively narrow WLA product market and then considering whether this should be broadened. We therefore begin our analysis by considering whether a distinct wholesale market exists for loop-based local access connections only. The majority of connections to end user premises involve such loops. We then consider the candidate substitutes for this product and the extent to which these impose a sufficient constraint to be included within the scope of the relevant market.

Local access substitutes

3.98 There are a number of candidate substitutes for local loops in the provision of WLA. We consider each of these in turn, and propose that:

- Cable-based local access is in the same product market as loop-based local access;
- Fibre-based local access is included in the product market definition;
- Mobile is not included in the product market;
- Fixed wireless is not included in the product market; and
- Satellite is not included in the product market.

3.99 In addition, we consider that it is it appropriate to define a single market for WLA for lines which are used for business and residential use.

Cable

3.100 As noted above, in the UK there is a cable access network which provides alternative means of fixed telecommunications services. We proposed in our retail market

definition that cable-based broadband access impose a sufficient constraint to be included within the same market. We now need to consider whether the constraints from cable at the WLA level are sufficient for it to be considered to be included within the scope of the relevant wholesale market.

3.101 As noted elsewhere, the WLA market is a notional market in that it is unlikely to exist in practice in the absence of regulatory obligations on a local access infrastructure operator to provide wholesale access to its network. Therefore, when considering the constraints that alternative cable infrastructure exerts on the focal loop-based local access we need to consider the strengths of indirect constraints that emanate from the retail level (on the presumption that absent regulation competition between loop-based and cable-based services would only take place at the retail level).

3.102 Using the HMT framework, an analysis of indirect constraints involves assessing the extent of demand-side and supply-side substitution between loop-based and cable-based services where cable services are available. Under the assumptions of the HMT framework, an increase in the price of the (notional) WLA would be passed through to the corresponding retail access prices faced by customers. The extent to which retail prices would increase would depend on the proportion of the retail price that is made up of the price of the wholesale input. We have estimated this to be between 65 and 75 per cent.

3.103 The extent of the resulting reduction in derived demand for, or increase in supply of loop-based access at the wholesale level would then inform whether the original wholesale price increase would be unprofitable. This approach is consistent with the approach we took in the 2004 WLA market review, the 2004 and 2008 WBA market reviews and the 2009 narrowband wholesale exchange line market review.

3.104 In those previous WLA and WBA market reviews, we consistently found that the indirect constraints from cable-based services would be sufficient to render a price rise at the wholesale level unprofitable such that the market should be broadened to include cable services. In the 2009 narrowband wholesale exchange line market review we concluded that it was not necessary to reach a definitive conclusion on this issue because even if the market were to be defined more narrowly, i.e., to exclude cable, then this would not impact the SMP conclusions. On this basis, we have determined that it is not necessary for us to yet again revisit this issue in detail and we propose to include cable-based services within the scope of the relevant market on the basis of indirect constraints, relying on the evidence available for previous reviews.

3.105 Similar to our approach in the narrowband wholesale exchange line market review we note that if we were to alternatively conclude that it was appropriate to define a narrow wholesale market for loop-based local access only, this could only affect the SMP conclusions to the extent that an operator is found not to hold a position of SMP in the broader market but does in the narrow loop-based access market, which is our focal market. However, if an operator has SMP under the broader market definition, this conclusion would only be strengthened by a narrowing of the wholesale market definition

NGA using fibre

3.106 Up until recently, there has been very limited deployment of fibre within access networks, with this largely being limited to the provision of, for example leased lines services to business end users. Such fibre-based connections are capable of supporting a range of services including narrowband and broadband services.

Historically, the cost of the equipment required to utilise fibre-based access connections has been typically higher than for loop-based or cable-based access connections and therefore these connections have tended to be used by larger organisations. Our business survey showed that no SMEs and 4 per cent of large businesses use leased line products, and only a portion of these are fibre-based.

3.107 Increasingly fibre is being deployed in the access network to support the provision of residential and business broadband access. For example, Virgin Media has already upgraded its network and BT's current NGA plan is to roll out fibre to the cabinet (FTTC) to 30 per cent of the UK population, and fibre to the premise (FTTP) to a further 10 per cent.

3.108 Our analysis of fibre-based retail broadband access shows that whilst there is some demand by early adopters for higher speed access, BT and Virgin Media have marketed their new fibre-based products very competitively compared to their current generation services. Therefore it is not clear that fibre-based services can act as a sufficient indirect constraint to prevent a 5 to 10 per cent increase in the wholesale price of loop- and cable-based local access from being profitable. This is particularly the case when consumers do not yet have experience of consuming the services that could be delivered over the upgraded networks. However, on a forward-looking basis, consumers' demand for even higher bandwidths may mean that they would be more willing to switch to higher speed services delivered using fibre than to remain on the current generation services.

3.109 In addition, it is unlikely that an increase in the wholesale charge of loop-based and cable-based local access would justify the high costs involved with fibre deployment which would be required for supply-side substitution to be an effective constraint. Nonetheless, it is likely that the services to be deployed using FTTC and FTTP technology would be similar to and extensions of existing broadband services. Indeed, this is how they have been marketed so far by both Virgin Media and BT. Increasingly fibre-based broadband access is becoming synonymous with super fast broadband access. Apart from speed, the similarities of the other characteristics of the broadband access service delivered over cable/DSL and fibre networks suggest that a single market exists.

3.110 As noted, it is also the case in the UK that the two vertically integrated access operators, BT and Virgin Media have either upgraded or are in the process of upgrading their access networks with fibre in order to offer higher speed services. It is likely that these operators will seek to encourage their existing (and new) customers to switch to the fibre-based access networks. This has been done so far primarily through little or no price differentials between their top-end current generation products and the new, higher speed services. On this basis we consider that fibre-based local access should be included within the scope of the relevant wholesale market.

Mobile

3.111 Our analysis of the retail market has shown that mobile access is not an effective constraint on fixed access such that we propose to exclude it from the definition of the relevant market. As we noted in the discussion of the retail market, in principle, mobile technology can provide a technical alternative to fixed local access, though mobile functionality is currently relatively limited. Substitution could occur directly, with a mobile connection replacing the fixed link between the end user and an operator's local equipment, or indirectly, with downstream mobile voice and data services substituting for similar services provided over fixed networks.

3.112 The 2009 wholesale narrowband market review concluded that mobile access and calls were not in the same markets as fixed access and calls. Although there is increasing evidence of consumers appearing to substitute mobile voice calls for fixed, the same is not true for access. Most people who make the majority of their calls using their mobile contract inclusive minutes tend to retain their fixed line access which is required for a broadband contract.

3.113 Nonetheless, the advent of a wide range of mobile broadband packages available currently suggests that there is demand for different price/service levels, from a pay as you go contract to a 24 month contract that is bundled with a laptop. As noted in the retail market definition discussion, our consumer survey continues to suggest that mobile broadband is still seen by most users as a complement[51], rather than a substitute, to existing fixed broadband services. As a result, a 5 percent to 10 percent increase in the price(s) of the relevant wholesale fixed local access is unlikely to be made unprofitable by substitution to wholesale provision of mobile local access services. We recognise that there are significant developments in the mobile market that may promote and encourage full substitution from fixed services. Nonetheless, we do not consider that this conclusion will change appreciably over the 2 to 3 year period relevant to this review. As such we propose to exclude mobile local access from the definition of the relevant wholesale market.

Fixed wireless access

3.114 As was the case with mobile services, our analysis of the retail market has shown that fixed wireless access is unlikely to be an effective constraint on fixed wired access and we propose to exclude it from the definition of the relevant market. The main technology used to provide fixed wireless access is WiMAX, which provides wireless transmission of data using a variety of transmission modes, from point-to-multipoint links to portable and fully mobile internet access (within the coverage area of the WiMAX signal). WiMAX can provide up to 10 Mbit/s broadband speed without the need for cables and therefore can be considered as an alternative to cable and DSL.

3.115 In the scenario where the wholesale market is notional, with alternative vertically integrated operators competing only at the retail level, fixed wireless access could be included within the scope of the relevant wholesale market on the basis of indirect constraints. However, as we have found that fixed wireless access is outside of the scope of the relevant retail market then any indirect constraints form a price rise of the notional wholesale product would be insufficient to include it within the scope of the market. An alternative could be that a fixed wireless operator could voluntarily make available a wholesale fixed wireless local access product for new entrants to use to compete in the retail market. However, our retail analysis indicates that any constraint that would emanate from such a WLA product would be insufficient to include fixed wireless access within the scope of the relevant retail market.

Satellite

3.116 Our analysis of the retail market proposed that satellite access services are not included within the scope of the relevant retail local access market due to a lack of effective demand-side and supply-side substitution. As noted in the discussion of the retail market there are two main forms of broadband satellite access available in the UK – one-way and two-way. One-way satellite provides a fast download speed, using the PSTN as the return path. This type of connection is good for downloading large

[51] Not necessarily in a strict economic sense.

files – such as music or videos – as well as every-day surfing, but not so good for sending large amounts of information. Two-way satellite broadband provides a fast link in both directions – enabling you to use more interactive applications.

3.117 For the same reasons given above for mobile local access and fixed wireless local access (lack of indirect constraints from the retail level given the lack of direct retail constraints) we propose that satellite local access is not included within the scope of the relevant wholesale market.

Business versus residential

3.118 In our analysis of the relevant retail market we proposed that there is likely to be a broad retail market that includes local access services for both residential and business end users. However, we recognised that at the retail level business users and residential users can demand significantly different services to be provided over their access lines. For example, business users might demand higher specification broadband services, e.g., in terms of contention, service management and repair times. The might also demand different retail services to be supported, such as ISDN 30 or retail leased lines services. However, at the wholesale level, such distinctions do not exist: the loop and cable connections used for residential applications are essentially identical to those used for business use, even if they support different retail applications. In this respect, provision of the local access product is different to provision of retail services, where business and residential customers might be expected to have different demands for supplementary services.

3.119 In light of this it is our view that it is appropriate to define a single WLA market for supply to both residential and business customers.

Self-supply

3.120 We consider that in the absence of a regulatory requirement to provide a wholesale service, such as LLU or WBA product, they would not necessarily be offered. As a result, the only such products would be those that are self-supplied. Other network operators (such as Virgin Media) self-supply a notional WBA for its retail cable broadband products. These provide an indirect constraint on the pricing of the copper-based broadband products. Therefore it is appropriate to include in the market definition the notional supply of wholesale products by other operators which self provide these elements in order to be able to offer a retail broadband service.

3.121 In the case where a wholesale service is provided, the key difference is that OCPs would be able to enter the market and compete directly at the retail level. Since the wholesale demand is derived from the retail market and the whole retail market would be considered to be in the same product market, it follows that the network operators' own use of wholesale products should also be taken into account.

Summary of WLA product market definition

3.122 In summary, we propose to define the scope of the relevant WLA market as including loop-based, cable-based and fibre-based local access at a fixed location. It excludes mobile-based, fixed wireless-based and satellite-based WLA. In addition we propose to include self supply in this definition, and have a single market for WLA for lines which are used for business and residential use.

Relationship between WLA and WBA markets

3.123 An important consideration of this market review (and our parallel review of the WBA market) is the appropriate delineation between WLA and WBA. In the previous markets reviews (the 2004 WLA market review and the 2008 WBA market review) a key distinction between these two markets has been the physical nature of the access being provided: physical access in the case of the WLA market and non-physical access in the case of the WBA market.

3.124 This approach has been consistent with the approach of the Commission, which under the Framework, recommends a number of markets that NRAs should review as it considers that these markets are susceptible to a need for ex ante regulation to be imposed. In the Recommendation on Markets, markets 4 and 5 are defined as follows:

- **Market 4**: Wholesale (physical) network infrastructure access (including shared or fully unbundled access) at a fixed location; and

- **Market 5**: Wholesale broadband access. This market comprises non-physical or virtual network access including 'bitstream' access at a fixed location. This market is situated downstream from the physical access covered by market 4 listed above, in that wholesale broadband access can be constructed using this input combined with other elements.

3.125 To date delineating these wholesale markets in this way has been effective because an appropriate and workable physical access remedy, exchange-based LLU, was identified, although even this only effective in some parts of the UK. However, in the context of the deployment of fibre access networks, it may no longer be appropriate to distinguish the wholesale market boundaries in this way. The deployment of fibre deeper in the access network means that the economic case for a physical access remedy is more challenging. Furthermore, new non-physical products are emerging, which have technical characteristics similar to those of purely physical access products.

3.126 In its EM, the Commission acknowledges that wholesale market definitions may need to evolve and adapt to network changes such as NGA deployment:

> *"…at this stage, given that these network changes are still taking place, it is difficult to be absolutely precise about the boundaries of the relevant prospective wholesale markets that are linked to the retail broadband market, in terms of their various possible technical characteristics. This suggests a more generic and forward-looking approach to market identification in this area at EU level (based on the two currently defined wholesale markets), within which regulatory authorities can analyse markets, with the twin aim of facilitating as much infrastructure-based competition as is economically efficient and addressing market power via appropriate access regulation"*

3.127 The EM also states:

> *"Depending on the way in which network upgrades occur or the particular demand and supply conditions evolve in Member States, these two wholesale markets [market 4 and market 5] may remain distinct, or conceivably merge into one. Consequently and for the reasons outlined above, it is recommended that the markets be analysed together."*

3.128 As suggested by the relevant EU guidance, wholesale market boundaries should be determined by considering demand and supply substitution and the capability and location of the services - rather than the physical nature of the access product. In particular, wholesale boundaries should be defined in a way that allows NRAs to impose the range of remedies required to secure effective and ongoing competition at the retail level.

Relevant vertical wholesale market boundaries

3.129 In the context of this market review and our parallel WBA market review we need to appropriately take into account the deployment of upgraded cable access networks and FTTC and FTTP on BT's access network and how this might impact the boundary between the WLA and WBA markets.

3.130 The SSNIP test, while being a useful tool for assessing whether horizontal products should be included within the same market, is not always useful for determining whether vertically related products should be included within the same market. This is because the SSNIP framework tests for substitution in response to relative price changes. With vertically related products the upstream product is an input into the downstream product. As such any relative price change would feed through to the downstream product and an assessment of substitution in these circumstances would not be instructive. In such cases, where one product is 'nested' in another, the SSNIP test is not a useful tool for determining whether both should be regarded as being in the same market.

3.131 However, the underlying purpose of the SSNIP test is to determine the relevant market by identifying the group of goods and services which are considered to be substitutes by the customer. While in practice it may not be possible to test the degree of substitutability between different vertically related, or nested products by applying the SSNIP test, it is nevertheless relevant to consider the extent to which products are likely to be viewed as reasonable alternatives by potential purchasers. The relevant market boundaries will be informed by examining the underlying product characteristics of various vertical products. Individual products with characteristics consistent with other products such that they are seen as viable alternatives by potential purchasers would be considered to be in the same market. Similarly, to the extent that an individual product has underlying product characteristics consistent with one category of product it would be considered to be in a different market from a product that has characteristics consistent with another category.

3.132 This is one way to think of the current distinction between products that fall within the WLA market, e.g., the underlying local access network infrastructure and the LLU/SLU suite of products and those that fall within the WBA market, e.g., BT's DataStream and IPStream products. The products in these separate markets have different underlying product characteristics and are not seen as viable alternatives by potential purchasers. For example LLU products are service agnostic and offer operators a far greater amount of control over the end user product specification than do DataStream and IPStream. As such it is appropriate that these are considered to be in separate markets. However, while DataStream and IPStream products have different technical specifications from each other and are vertically related, they are sufficiently similar to be included in the same market, based on an assessment of product characteristics.

3.133 The relevant underlying characteristics of an access product will be linked to, but not determined by, the physical nature of the access being provided, with physical access products providing users with more control and scope to differentiate and

innovate than non-physical products. This is why, in the past, WLA and WBA products have been grouped according to the physical nature of the access. But, as we have noted in the discussion of the wholesale product definition, the WLA market is a notional market in which there are significant network changes occurring or expected to occur over the coming years. Given these developments, it might not necessarily be the case that the appropriate vertical boundary should be based on the physical nature of the access being provided, as has been the case in the past. Indeed, on a forward look we consider that non-physical products that have underlying technical characteristics consistent with physical products such as LLU or fibre unbundling are likely to become technically and economically feasible. Therefore, it may be appropriate to include such non-physical products within the same market as those physical products.

3.134 By identifying the market boundary in reference to the relevant underlying product characteristics and considering the conditions of competition those characteristics are likely to support, we can ensure that wholesale markets are grouped in a way that the conditions of competition will be sufficiently homogeneous such that these should be included in the same economic market. This approach is consistent with the guidance of the Commission set out in its EM and it is consistent with general economic principles of market definition.

3.135 We consider that the relevant key characteristics that a product would have to have in order to be considered to fall within the scope of the WLA market are:

- *Localness*. The product should be available at a location close to the end customer. This mimics the inherent localness of existing local access remedies (LLU);
- *Minimum functionality incorporated*. Inherent capability of the access technology is made available and the service is undimensioned. Allows CPs to change and control the functionality and quality of service ("QoS");
- *Service agnostic*. The product should not be confined to supporting particular downstream services, e.g., it should be able to support broadband internet access, narrowband voice, symmetric and asymmetric services (within confines of the inherent capability of the access technology); and
- *Dedicated capacity*. The capacity in the access segment (from the premise to the point of interconnection) should be dedicated to the end user, again similar to the case for LLU.

3.136 These characteristics are all fulfilled by the currently mandated WLA products LLU and SLU which are both physical in nature. However, it is feasible that these product characteristics could be present in a non-physical product. Where this is the case operators would consider the physical and non-physical products to be broadly equivalent and alternative options to be used to provide downstream services. Therefore, we consider that the relevant economic market in terms of fibre-based local access networks should not be limited to strictly physical elements but should be expanded to include non-physical elements to the extent that any non-physical product exhibits the same underlying technical characteristics.

Relationship to WBA

3.137 While this proposed market definition has the scope to include non-physical elements we consider that there are a number of key differences between the underlying

product characteristics for WLA compared to the underlying product characteristics of the downstream WBA market. In terms of the product characteristics listed above, for WBA the key product characteristics are:

- *Aggregation*. The product tends to be highly aggregated such that CPs can pick it up at a relatively limited number of aggregation points;

- *Functionality more highly specified*. A WBA product will be more dimensioned when delivered to the CP, limiting the control of the functionality and QoS of the product;

- *Service specific.* A WBA product is configured to deliver asymmetric broadband internet access; and

- *Shared capacity.* The capacity is shared between different end users.

3.138 The differences in the underlying product characteristics and the conditions of competition and constraints between services meeting these characteristics, and those meeting the characteristics of WLA, are such that they are unlikely to be in the same relevant economic market, in much the same way that WBA products (IPStream) and WLA product (LLU) are today not considered to be in the same wholesale market. A wholesale purchaser of WBA is not likely to view WLA as an adequate alternative or vice versa, because of the differences in underlying product characteristics.

3.139 In considering this question of the appropriate boundary between the relevant economic markets we have sought to bear in mind the purpose of market definition, which is a means to undertake an analysis of competitive conditions, for the purpose of determining whether ex ante regulation is required or not. In doing this it is important to recognise that the objective of the market review process is to secure adequate competition at the retail level to further the interests of consumers. Therefore it is appropriate, when defining the scope of the market to bear in mind the issue of remedies (subject to a finding of SMP in the market) and whether these can be effective in securing our aims.

3.140 In light of this, we consider it is important that the relevant wholesale markets should be defined in a way that allows us to impose the range of remedies (if necessary) required to secure effective and ongoing competition at the retail level. This suggests that wholesale markets should be defined such that we are able, if appropriate to impose effective remedies for fibre-based services as well as copper- or cable-based services. We explore the necessity for such an approach to multiple remedies within the market in detail in Sections 7 and 8.

3.141 For completeness it is also useful to consider the issue of the relevant vertical market boundary in terms of economic bottlenecks and where these exist in the network as this would be the approach we would take if we were conducting a competition analysis under competition law where we would not define a notional wholesale market. In the 2004 WLA market review, implicit in our analysis we identified the economic bottleneck as being the physical access network, e.g., the local copper loop as this is where we imposed remedies to address the identified competition problems. However, in circumstances where new fibre local access networks are deployed it is not necessarily the case that the physical local access network continues to be the relevant economic bottleneck.

3.142 The economics and technological characteristics of fibre means that the boundary of the physical access network is unlikely to be where the economic bottleneck is present, at least not in a large part of the UK. Unlike for copper access networks, given the fibre deployments that are taking place in the UK (GPON), pure physical unbundling of the fibre is likely to be costly and impractical such that it is not economically feasible. In addition, the costs associated with providing services on the basis of access to alternative potential bottlenecks, such as the duct infrastructure as the point of access is unlikely to be economic on a widespread basis, at least in the immediate term. Moreover we are not in a position to identify in which areas such infrastructure access might be economically feasible. Given these facts we have explored whether the relevant economic bottleneck might include non-physical elements. This shows that the relevant economic bottleneck in terms of fibre-based access networks, like our substitution analysis above, includes non-physical elements. We discuss these issues further in our discussion of remedies in Sections 7 and 8 below.

3.143 It is also illustrative to consider the potential outcome if the market boundary were to be defined to be strictly the same as in the Recommendation on Markets, i.e., with reference to physical and non-physical access. One of the important implications of such an approach is that it may not be possible to impose effective remedies for fibre-based services in all parts of the country. This could be the case if there is likely to be a limited prospect for physical remedies to secure widespread effective and sustainable competition for services provided over these access networks and it is not currently possible for us to identify where these areas might be. Over time, technological developments and changes in demand may mean that the technical and economic feasibility of remedies for fibre-based services may change. As noted above, the EM recognises that the definition proposed in its Recommendation on Markets might need to evolve as network changes occur. Therefore we consider our approach to be consistent with the EM.

3.144 The ERG has also considered the issue of the vertical boundary between the WLA and the WBA markets. In the ERG NGA Common Position and its subsequent Report on NGA its view at that time was that the market boundary based on the physicality of networks remained valid. As such, our proposed market definition varies slightly from the position in those documents. However, we consider this departure to be appropriate for the reasons outlined above.

Conclusions on the relevant vertical wholesale market boundary

3.145 Taking the factors above into account, we consider it is necessary and appropriate to broaden the definition of the WLA market to include non-physical elements in order to secure adequate competition in retail broadband markets, while ensuring a consistent approach with the EU framework. However, as noted, the underlying product characteristics of products included within the market should be closely aligned with the underlying characteristics of purely physical products, as set out above.

Wholesale geographic market definition

Introduction

3.146 In our product market definition analysis we proposed that at the retail level, the relevant products are the variety of communications services supplied via a fixed connection to a communications network, including all narrowband and broadband services. At the wholesale level, we proposed that the product market should be

defined as including loop-based, cable-based and fibre-based local access at a fixed location. We proposed that it excludes mobile-based, fixed wireless-based and satellite-based WLA.

3.147 Moreover, our analysis of the relevant product market does not lead us to propose to define separate markets for higher speed broadband services, based on NGA technologies.

3.148 Having considered the relevant wholesale product market definition, we now consider the scope of the relevant wholesale geographic market definition. As with the product market definition, when defining the geographic scope of a market it is important to bear in mind that market definition is a means to an end and not an end in itself. As stated in the EM, the purpose of conducting a market definition exercise is to identify the relevant products and geographic area in which to undertake an analysis of competitive conditions for the purpose of determining whether ex ante regulation is required or not. This is the basis on which we have conducted our analysis.

Analytical framework

3.149 The principles of demand-side and supply-side substitution and the SSNIP test that aims to identify them can in principle also be used to define the geographic scope of the relevant market. However, rather than considering alternative products, the analysis assesses the effect on demand for the relevant product if there is a relative price change in a narrow geographic area. If products in the relevant product market in other areas are sufficient substitutes, such as to render the price rise unprofitable, then the geographic scope of the relevant market is widened to include these additional areas. Similar principles apply in relation to supply-side substitution. The presence of common pricing constraints across geographic areas is also relevant for the purposes of defining the geographic scope of a market.

3.150 A SSNIP test is not always the most practical method of defining geographic markets however. Also relevant is paragraph 56 of the SMP, which states that in cases where there is a sufficient degree of variety in competitive conditions between geographic areas (what might be a sufficient level is not specified), distinct local markets should be defined:

> "According to established case law, the relevant geographic market comprises an area in which the undertakings concerned are involved in the supply and demand of the relevant products or services, in which area the conditions of competition are similar or sufficiently homogeneous and which can be distinguished from neighbouring areas in which the prevailing conditions of competition are appreciably different. The definition of the geographic market does not require the conditions of competition between traders or providers of services to be perfectly homogeneous. It is sufficient that they are similar or sufficiently homogeneous, and accordingly, only those areas in which the conditions of competition are 'heterogeneous' may not be considered to constitute a uniform market."

3.151 This suggests that, instead of the SSNIP test, different geographic areas could be found to be in the same relevant geographic markets to the extent that competitive conditions in different areas are sufficiently homogeneous.

ERG Common Position on geographic aspects of market analysis

3.152 In response to our decision in the 2008 WBA market review and our 2008 business connectivity market review ("the BCMR") [52], as well as proposals from the Austrian and Portuguese regulators in their respective WBA market reviews, the ERG developed a Common Position which it published in October 2008.[53] This identifies three main steps in conducting a geographically differentiated approach to market analysis, once it has been established that a national market cannot be defined on the basis of common pricing constraints:

- first, the basic geographic unit needs to be selected, for example post codes or local exchange areas;
- second, the homogeneity of competition needs to be judged according to factors such as barriers to entry, the number of significant suppliers in the market, distribution of market shares and price-cost margins and as such necessarily conflates the market definition and SMP analysis to some extent; and
- third, areas with similar competitive characteristics need to be aggregated in order to define the geographic areas over which to conduct the SMP analysis.

3.153 The approach adopted in this review of the WLA market is as follows. First we consider the implications of the SSNIP test. However, as in the previous and current WBA market reviews, and as discussed further below, we do not regard a SSNIP test analysis as being useful in this case as it would lead to excessively narrow geographic markets being defined. Instead we define a single geographic market where a common pricing constraint exists (or is likely to exist). Therefore it is also not necessary in this case to carry out a detailed analysis to identify areas of competitive homogeneity. However, we also briefly consider the extent of variations in competitive conditions.

3.154 In terms of the WLA product market, like many wholesale market definition exercises under the European Framework, we are seeking to define the geographic scope of a notional market. That is to say that under the modified Greenfield approach where we need to abstract from SMP-derived regulation imposed at the level or downstream of the market being reviewed, there is unlikely to be a standard wholesale product offered to the open market comparable to that which exists under current regulation. In the event of voluntary supply of WLA to third parties this would likely be a result of bespoke bargaining. In such a scenario, competition would only take place at the retail level between vertically integrated operators, in this case specifically BT, which is present throughout the UK (excluding the Hull area) and the cable operator Virgin Media, which is present in around 46 percent of the UK (by delivery point).

3.155 Because the wholesale market is notional in our analysis and competition can only be assumed to take place at the retail level, the consideration of constraints has to be derived from the retail level. This means that by construct when we consider constraints at the wholesale level, we are considering a hypothetical situation, which means it is not possible to be incontrovertibly definitive in our conclusions.

[52] Ofcom, Business connectivity market review, December 2008. http://www.ofcom.org.uk/consult/condocs/bcmr08/

[53] http://erg.ec.europa.eu/doc/publications/erg_08_20b_final_cp_geog_aspects_cons_report_081016.pdfhttp://erg.ec.europa.eu/doc/publications/erg_08_20b_final_cp_geog_aspects_cons_report_081016.pdf

Nevertheless, a careful consideration of the incentives facing the relevant firms does provide insights into their likely behaviour absent SMP regulation.

Geographic demand and supply-side substitution

3.156 The consideration of geographic substitution, like in the case of product market definition is typically conducted using the hypothetical monopolist (or SSNIP) test, which asks what products (or geographic areas) a hypothetical monopolist would need to dominate in order to be able to profitably raise prices by 5 to 10 per cent above the competitive level for a sustained period. The test works by identifying whether customers would substitute to other products (or geographic areas) in the face of such a price rise and also whether any firms supplying different products would begin to supply the product (or geographic area) in question as a result of the price increase.

3.157 As noted previously the wholesale services we are considering in this market review are notional and it needs to be recognised that these notional wholesale services are an input to other products and services that are subsequently used to supply various downstream (retail) markets. Further, local access networks, in keeping with communications networks more generally, have a fixed and pre-defined geographic presence. This means that a wholesale purchaser would only be able to switch its demand to an alternative area if the downstream (retail) customer is willing to move to that alternative area. Thus, the question becomes whether a sufficient number of downstream customers would move location (house, business premise, etc.) in response to a SSNIP at the wholesale level, such as to make the SSNIP unprofitable.

3.158 Given that the cost associated with moving location is likely to be significantly higher than the cost associated with a WLA SSNIP, it is reasonable to conclude that geographic demand-side substitution is either a very weak or non-existent constraint. This approach would therefore lead to the definition of very narrow markets from the demand-side, which are unlikely to be practical to analyse or be representative of competitive constraints that exist. We therefore conclude that in this case demand-side substitution is not relevant to assessing the geographic market definition.

3.159 On the demand-side the question being asked is whether a supplier of local access who is operating in one geographic area would start supplying in another geographic area if this other area was exposed to a SSNIP by a hypothetical monopolist, to the extent that it would render the SSNIP unprofitable. If the SSNIP would be unprofitable then these geographic areas should be grouped together for the purpose of defining the relevant market.

3.160 In communications markets geographic supply-side substitution is generally considered to be a weak or non-existent constraint due to the high cost and long lead times associated with deploying new network infrastructure. This is especially the case for local access networks where there are no upstream remedies which might act to lower the associated costs.

3.161 Therefore, similar to demand-side substitution, supply-side substitution is limited by the need for an operator in a different geographic area to invest in new infrastructure. In the case of local access networks this would involve significant sunk costs so it is very unlikely that there would be supply-side substitution from one geographic area to another in response to a price rise by a hypothetical monopolist. This approach again would lead to the definition of very narrow markets which are unlikely to be practical to analyse or be representative of competitive constraints that exist. For

these reasons, we have not used a SSNIP test approach to define geographic markets in WLA.

Common pricing constraints

3.162 As noted above, the presence of common pricing constraints can also inform the definition of the geographic scope of a market. This approach considers the extent to which firms present in a market are able to or would be expected to differentiate their pricing between different geographic areas. For example, if there are two different geographic areas in which the competitive conditions are different, but there exists a common pricing constraint between them, such that the competitive constraints in one geographic area are transmitted and extended to the other geographic area then the two areas are taken to be a single market. Until the recent past this has been the standard basis for arguing that fixed communications markets are national in scope. The exceptions to this have been in some of the wholesale leased lines markets and in the WBA market where we have observed prices which vary by geographic location such that it is clear that no national common pricing constraint is present. We provide further details of these below.

2004 WLA market review

3.163 In the 2004 WLA Statement we concluded that there was a single national market for WLA, based on the existence of a common pricing constraint at the wholesale level (in reaching this conclusion the report also noted that common pricing is the norm at the retail level). That is, even though BT faces competition from cable in only around half the country, because it sets prices on a national basis at the retail level the competitive pressure imposed by the cable network will influence and constrain BT across the entire country. In particular this means that national figures for market shares give a better sense of the extent to which BT takes the potential for consumer switching to cable networks into account when setting prices and other aspects of its service offerings.

3.164 In considering the issue of geographic market definition for this market review we have revisited our analysis from the 2004 WLA market review and analysed the issue again from first principles.

Common pricing constraint in WLA

3.165 The fact that we are dealing with a notional wholesale product which is unlikely to exist absent a regulatory requirement to make it available creates difficulties when we come to defining the geographic scope of the market. This is because part of the consideration of the definition of the geographic market is, as explained above, the extent to which there exist pricing constraints which extend across geographic areas. In a scenario where there is no wholesale product provided, there are no prices to observe. Similarly, many wholesale products where they are provided and pricing can be observed are supplied under regulated terms and conditions. All of this together makes the exercise very hypothetical, as we have to envisage what pricing decision might be made in the event that a wholesale product is voluntarily offered in the absence of SMP regulation.

3.166 As explained previously, in terms of WLA, two operators have local access networks, BT (which is national, excluding the Hull area) and Virgin Media (which is geographically limited to about 46 per cent of UK premises). At the retail level, both operators offer a uniform price for access across all of their networks. In the case of Virgin Media, this pricing decision in completely voluntary. In the case of BT however,

it is not clear whether this is completely voluntary as it is subject to universal service obligation regulation (the impact of which is appropriate to take into account under the modified Greenfield approach) which requires BT to provide access to basic telephone services upon reasonable request and at uniform prices and data rates that are sufficient to permit functional internet access. In terms of retail broadband services, there is no universal service obligation, but BT and Virgin Media both voluntarily set national/ network-wide uniform prices. These factors suggest at the retail level at least that there is a national common pricing constraint such that to the extent that BT responds to the competitive constraint from Virgin Media in its cable footprint area then this response is transferred throughout the whole of the UK.

3.167 As noted above, under the modified Greenfield approach the market must be assessed on the assumption that it is unregulated. It is not clear that, in these circumstances, BT would choose to offer any form of wholesale access or, if it did, what form it would take. In this sense, the wholesale product market that we would be seeking to assess is a notional product market. All that we can actually observe at the wholesale level are the prices of the wholesale products which BT is required to provide under its regulatory obligations. We require that BT, as part of the SMP conditions in the market, supplies WLA at nationally uniform charges. Therefore, under the modified Greenfield approach we cannot use this evidence of national pricing to inform what the appropriate market definition is, as this would introduce circularity into the analysis.

3.168 We have considered BT's likely choice of wholesale charging structure by evaluating its past behaviour, and by assessing its ability and incentives to set non uniform charges. In relation to the first point, we consider the evidence from BT's pricing behaviour for other wholesale services where there is no obligation on it to set nationally uniform charges. In relation to the second point, BT's ability and incentive to set non uniform charges, we consider the effect of the Universal Service Obligation, along with the influence of menu costs, the desire to maintain brand value and possible strategic pricing issues.

3.169 We assessed BT's pricing behaviour where it was unconstrained by regulation in the 2004 WLA market review to inform the geographic market definition at that time. The main wholesale markets where BT has such flexibility to set its wholesale charges are the various wholesale business connectivity (leased lines) markets and WBA markets. These are considered in turn.

Wholesale business connectivity

3.170 In these markets BT has historically tended to set nationally averaged charges. There have however been some exceptions to this, specifically where BT has offered a discounted rate for some services in what it calls the Central London Zone, the boundary of which it defined by the 020(7) dialling code area. In the business connectivity market review we summarised BT's pricing policies by product markets in Figure 3.10 below.

3.171 This evidence might suggest that there are conditions of local competition in the London area in some of these markets (or products within broader markets). In fact, the BCMR concluded that there were local geographic markets in the London area (but not defined in reference to the 020(7) dialling code area) for the high bandwidth TISBO market and the very high bandwidth TISBO market. This was based on an analysis of local service shares (by postal sector) and identifying those postal sectors where there were at least two operators present in addition to BT.

Figure 3.10 Summary of BT's pricing by product market as at January 2008

Market	BT pricing policy
Low bandwidth traditional interface retail	Some circuits priced at a discount in CLZ[1]
Low bandwidth TISBO	Some circuits priced at a discount in CLZ[1]
High bandwidth TISBO	CLZ discount
Very high bandwidth TISBO	CLZ discount
Low bandwidth AISBO	Single national price
High Bandwidth AISBO	Single national price

1: 2Mbit/s circuits.

WBA

3.172 In the WBA market BT had historically set a nationally uniform price, despite no regulatory obligation to do so. However, in 2005, in response to increased competition from LLU operators, BT introduced a discount on its Datastream and IPStream products in its 'dense cell' exchanges, with these exchanges being identified by a number of different parameters, such as broadband take up and number of delivery points served. BT increased the number of exchanges from which the discount was available as LLU roll-out increased.

3.173 As a result of the change in competitive conditions arising from the roll-out of services based on LLU and BT's response to this change, we defined local geographic markets in the WBA market, which led to a no SMP finding in around 70 percent of the UK.

Implications for geographic market definition in the WLA market

3.174 The most interesting observation from the above is that where BT has voluntarily introduced local pricing it has done so in response to fairly intense competition from multiple alternative operators. BT has not introduced local pricing in response to more modest levels of competition. In particular, there is no observable instance where it has done so in the face of competition only from alternative cable infrastructure.

3.175 In terms of the markets considered in the BCMR where local pricing is adopted, BT has faced long established competition in central London from both COLT and C&W and currently faces even more operators in some central locations. In addition, the market features strong competition with well informed commercial customers negotiating large contracts. We also note that cable infrastructure in the London area is relatively less important than the infrastructure of alternative operators who have built their own access networks to serve business customers. The market is almost certainly much more competitive than WLA cable areas would be in the absence of remedies. In terms of broadband services, BT maintained national pricing in face of strong competition from cable in the early years of broadband roll-out and it was only when faced by competition from multiple LLU operators that it responded by moving away from nationally uniform pricing.

3.176 While we cannot be definitive about what pricing would emerge in a WLA market where wholesale products were voluntarily offered and there was no obligation to offer these at a nationally uniform price, consideration of other markets appears to support the case that it is most likely that faced with competition only from Virgin Media as the cable access operator, BT would maintain a policy of national pricing. Indeed there is little, if any, evidence to suggest that BT would introduce local pricing.

Other potential indicators of pricing in an unregulated environment

3.177 As noted above, we have also considered the factors which might influence BT's ability and incentive to adopt a non uniform pricing strategy for a voluntarily offered wholesale local access product. These include the influence of the universal service obligations in place on BT, the 'menu costs' and effect on brand value associated with setting local prices and the strategic incentives that economic theory tells us BT might have to set a national price to soften competition in cable areas.

Universal Service Obligation

3.178 With BT being a designated universal service provider, as noted above it is accordingly required to provide access to basic telephone services upon reasonable request and at uniform prices and at data rates that are sufficient to permit functional internet access. As the Universal Service Obligation ("USO") and the requirement to set geographically uniform prices do not directly affect BT's market power in the relevant market and is not derived from a SMP finding in the relevant market, it is necessary and consistent with the modified Greenfield approach to factor into our market definition the presence and effect of this obligation.

3.179 Basic telephone services and functional internet access are downstream of the WLA market and thus in order for BT to fulfil its universal service obligations it must also provide telecoms connectivity. The wholesale input (which may be limited to self-provision) to this telecoms connectivity resides in the WLA market. Whilst the universal service obligations apply at the retail level, the uniform pricing requirement must be reflected in the upstream wholesale levels, even if costs vary by geography as we explain below.

3.180 In a market with no SMP regulation, BT will only supply WLA to third parties if it is profitable for it to do so. As we noted earlier, it is possible that BT would in fact choose not to supply WLA to third parties at all, and would operate as a fully vertical integrated supplier. However, if some other operators are more efficient than BT in downstream markets, BT may be able to increase its profits by using one of these more efficient retailers to supply broadband. This is true even if, as we assume here, the output of the competing retailer simply substitutes for BT's own supply of retail broadband, as more efficient retailers can expand the market and hence the demand for BT's wholesale product.

3.181 BT can then use the wholesale price to discover more efficient retailers by making a wholesale offer at the level of its retail price minus the costs BT saves by not retailing the product itself. Another operator will then only purchase the wholesale product if its costs are lower than BT's.

3.182 Then if the retail price is uniform and the avoidable (incremental) costs saved are also uniform, BT would voluntarily offer a wholesale product at a uniform price. Even if the costs saved are not strictly uniform, the fact that the retail price is uniform and all wholesale prices move together with the retail price (even if there is some variation in the retail margin) means that there is a common pricing constraint linking

all geographic areas. While wholesale prices may not be constrained to be identical, they are still constrained to some fixed relationship with each other and this means conditions in one geographical area will affect the wholesale prices set in another.

3.183 In this case, BT will not find it profitable to supply WLA to third parties at charges which reflect only the (network) costs of supply. This is because to do so would create a geographical arbitrage opportunity, as explained below.

3.184 Suppose that the uniform retail price is just sufficient to cover BT's costs on average, including the cost of capital (as it would be in a competitive market). Then, if wholesale costs vary geographically, high profits in areas where wholesale costs are low offset losses in areas where wholesale costs are high. It would not then be feasible for BT to supply WLA at cost-based charges to operators who compete with it in downstream markets and, at the same time, maintain a uniform retail price. This is because entry would be most attractive in low cost areas as a competing operator which, we assume, has no obligation to provide a national service, would be able to undercut the nationally averaged retail price in these areas[54]. Thus entry would be likely to occur in low cost areas, undermining BT's ability to continue funding its universal service obligations in high cost areas without increasing the level of its retail prices (as these are based on a geographically averaged costs). Therefore in order to be able to continue to fund a nationally averaged universal service retail price, there is an implicit requirement on BT, where it provides WLA services, to do so at a nationally uniform price.

3.185 We have so far assumed that, if BT does not supply WLA, the alternative is that it supplies the customer with access at the retail level. However, this may not always be the case. Some alternative retailers may address niche markets or have a strong brand which enables them to expand the market rather than simply 'cannibalising' BT retail sales. In such cases, BT might voluntarily negotiate an agreement to supply WLA at bespoke prices which are likely to vary primarily according to the identity of the purchaser. To the extent that supply is voluntary and BT makes WLA *generally* available then a requirement for the retail price to be geographically uniform will tend to be reflected in a price for WLA which is also geographically uniform.

Menu costs, Brand Value and Strategic Issues

3.186 Absent regulation, as discussed above, the main focus of competition between a vertically integrated BT and Virgin Media would be at the retail level which would impose indirect constraints on any (real or notional) supply at the wholesale level. Given the fixed nature of, or at least significant economies of scale in, setting and marketing tariffs at the retail level (i.e., 'menu costs') there may be significant advantages to adopting national pricing. Setting two or more sets of prices will incur extra costs in terms of money and managerial effort and the benefits may be relatively modest, particularly where the uniform price is not far from the local price that would be chosen (or as discussed below, where there are strategic advantages to national pricing).

3.187 The pressure to adopt uniform pricing might be increased by the fact that price differences based only on differences in competition could pose risks to BT's brand image, whereas differences based on underlying costs may be seen as more acceptable to consumers. For example, it might be difficult for BT to justify to its customers and customer groups price differences if it attempted to pose lower retail

[54] This also applies in a world where no wholesale services are supplied, but in that scenario entry is via network build.

charges in those areas where it faces competition from Virgin Media compared to those areas where it faces no competition. This risk to brand image could act as a significant restraint. By pricing higher in its monopoly areas BT could damage its reputation with corresponding harm to either sales in cable areas, where customers are free to switch, or sales for additional services where BT faces competition, for example pay-TV.

3.188 These pressures may be further strengthened by strategic factors. Economic theory tells us that firms in a concentrated market can often soften competition by pursuing strategies that limit their own actions[55]. In particular, in some circumstances, if a firm can remove its own incentive to act aggressively, and if this is widely known, competitors will follow suit and adopt non-aggressive stances themselves. Despite the disadvantages of limiting the flexibility to act, such a strategy can be profitable for strategic reasons, that is, because of the effect on rivals' expectations and resulting behaviour.

3.189 As recent research has highlighted, national pricing by a firm that has a monopoly position in one region of a country may soften competition in competitive areas[56]. Due to the lack of competition, the firm will be reluctant to cut prices to consumers in its monopoly area and because of its policy of setting national prices this leads to higher prices in competitive areas that if it had set local prices. The recent research highlights that competitors will then adopt non-aggressive pricing themselves and profits across the market generally will rise.[57]

3.190 This strategy requires rivals to be confident that the firm will adopt national pricing and not suddenly switch to local pricing. There are many ways to achieve this, including long term investments in national marketing or advertising channels. As noted above, concerns that local pricing will be regarded as unfair may also support national pricing and a firm can exploit this by investing in a particular brand image. Alternatively a firm could generate a reputation for national pricing over time.

3.191 While it is not possible to be definitive on the incentives faced by BT and Virgin Media in the wholesale local access market, it is clearly feasible that a commitment to price nationally may be a profitable strategy for BT to adopt since it would have the effect of allowing it, absent regulatory obligations otherwise, to maintain prices above competitive levels in cable areas, despite foregoing revenues from more price sensitive consumers who might switch to Virgin Media. As noted, such a strategy by BT would allow Virgin Media to undercut BT in cable areas but could still be profitable given that overall prices will be higher. Even if the strategic effects alone are not enough to make national pricing more profitable than local pricing, the combination of menu costs and strategic effects may well be sufficient. Put another way, even if menu costs are relatively modest, they may still be enough to tip the balance and induce national pricing once the strategic effect is taken

[55] Specifically, game theory tells us that a firm can alter the behaviour of rivals and increase profits by pre-committing to a particular course of action. The pre-commitment, if credible, alters rival's expectation about its behaviour and therefore shifts the outcome in the market.
[56] For a detailed discussion on this point, see Dobson and Waterson (2008) "Chain Store Competition: Customized vs. Uniform Pricing", *Warwick Economic Research Papers.* Referring to evidence gathered as part of the Competition Commission investigation into grocery retailing, the authors note that supermarkets adopt national pricing despite local variations in cost and competition. They note that a commitment to national pricing (which is essential for its strategic use) can be supported from concerns about brand image.
[57] This follows from the fact that prices are (usually) strategic complements for (imperfect) substitutes.

3.192 Uniform retail prices are the norm for fixed line services despite regional variations in the intensity of competition, costs of supply and consumer characteristics (e.g., average incomes), suggesting that these issues are a factor in these markets. While it is true that many LLU operators price differently in those areas where they have rolled-out their own networks based on LLU wholesale products compared to areas where they use products such as Datastream/IPStream, the large differences in cost structure provide a significant incentive for them to do so. Consequently this does not necessarily suggest the absence of pressures to price uniformly, but could reflect the cost structure of LLU, under which once an operator has sunk the fixed costs of building out to a specific local exchange it has a strong incentive to acquire customers within that exchange area since the incremental costs of customer supply are relatively low. The use of Datasream/IPStream type wholesale products in contrast generates a high variable cost, significantly reducing the incentive to price aggressively (there are relatively less economies of scale and density). This means LLU operators will have a particularly strong incentive to adopt local pricing in their LLU footprint, even in the face of countervailing pressures to adopt uniform pricing. Notably, LLU operators do not vary prices by area on any basis other than their cost structure i.e., they have two prices at the retail level: in area and out of area.

3.193 In terms of local access products, we do not believe local access network operators such as BT or Virgin Media would have a comparable incentive to differentiate pricing in a scenario where existing regulation is absent. As noted above, in terms of BT, past experience suggests local competitive pressure from cable alone is not sufficient to induce local pricing.

Conclusion on geographic market definition

3.194 As noted above, while it is not possible to be incontrovertibly conclusive on the question of geographic market definition in the WLA market, due to the notional nature of the market being assessed and the hypothetical nature of the modified Greenfield approach, we consider that there are sound economic reasons to be of the view that the market would be national in scope.

3.195 It is our view that a common pricing constraint would exist in the WLA market and that a national market (excluding Hull) can be defined on this basis. Consequently we do not consider that it is necessary for us to conduct a detailed geographic analysis based on identifying areas of competitive homogeneity. However, that said, it is important to recognise that Virgin Media is present in the market and that its presence (and any corresponding competitive constraints arising from its presence) is on a sub-national basis, i.e., its cable footprint. Therefore, while we consider that the market is national in scope, it nevertheless exhibits local characteristics. This should be borne in mind when we assess whether any operator has SMP in the market and when we consider which remedies, if any, are necessary to address any identified SMP

3.196 Based on the above analysis we proposed to define the following WLA geographic markets:

- the United Kingdom, excluding the Hull Area; and
- the Hull Area.

Summary of proposed market definition

3.197 In summary, we propose to define the scope of the relevant WLA market as including loop-based, cable-based and fibre-based local access at a fixed location. It excludes mobile-based, fixed wireless-based and satellite-based WLA. In addition we propose to include self supply in this definition, and have a single market for WLA for lines which are used for business and residential use. As stated in the previous paragraph, we have also proposed two geographic WLA markets.

3.198 Throughout our market definition analysis we have been particularly aware of the need to ensure that our market definitions fully take into account market developments expected over the next four years. This is particularly the case in respect of the upgrade of Virgin Media's cable local access network and the intended upgrade of BT's local access network to enable these to provide higher speed services. We have also particularly considered this issue in respect of how we have considered alternative access technologies - such as mobile, fixed wireless and satellite – which we propose will continue to be outside the WLA market over the next four years.

3.199 Our geographic market definition also takes into account how we envisage forthcoming market developments. The nature of local access networks means that there is likely to be very little change in the geographic nature of competition. Therefore, we consider that a national market, albeit with local characteristics, will remain the appropriate conclusion for the next four years.

Relationship between the wholesale market definition and the Commission's Recommendation on product and service markets

3.200 The Commission's Recommendation on Markets define the WLA market as being:

- "wholesale (physical) network infrastructure access (including shared or fully unbundled access) at a fixed location"

3.201 As we set out above in our discussion of the relationship between WLA and WBA, the EM acknowledges that the wholesale market definitions may need to evolve and adapt to network changes such as NGA deployment. Therefore, whilst our proposed market definition includes non-physical elements for which key underlying product characteristics are present, we consider that this definition is consistent with the approach set out by the Commission in the Recommendation on Markets and the EM.

Consultation questions

Question 1 Do you agree with our proposed product market definition? If not, please explain why.

Question 2 Do you agree with our proposed geographic market definition? If not, please explain why.

Section 4

Market power assessment

Introduction

4.1 Market definition is not an end in itself. The definition of the scope of the relevant economic market is carried out in order to identify the products and the geographic area over which an assessment can be made of operators' ability to act to an appreciable extent independently of competitors, customers and consumers, i.e., whether there are any operators that hold a position of SMP within a particular market.

4.2 In this section we set out our conclusions on the market position of CPs in each of the relevant product markets.

Approach to market power assessment

4.3 Under the market review process, SMP has been defined as equivalent to the competition law concept of dominance:

> "*An undertaking shall be deemed to have significant market power if, either individually or jointly with others, it enjoys a position equivalent to dominance, that is to say a position of economic strength affording it the power to behave to an appreciable extent independently of competitors, customers and ultimately consumers*."

4.4 Therefore, in the relevant market, one or more undertakings may be designated as having SMP where that undertaking, or undertakings, enjoy(s) a position of dominance. Also, an undertaking may be designated as having SMP where it could lever its market power from a closely related market into the relevant market, thereby strengthening its market power in the relevant market:

> "*Where an undertaking has significant market power on a specific market, it may also be deemed to have significant market power on a closely related market, where the links between the two markets are such as to allow the market power held in one market to be leveraged into the other market, thereby strengthening the market power of the undertaking*".

The Criteria for assessing SMP

4.5 In assessing whether an undertaking has SMP, we have taken due account of the SMP Guidelines and we have also considered the application of the relevant Oftel Guidelines[58].

4.6 We are required to assess whether the relevant markets that we propose in Section 3 are effectively competitive, That is, we are required to assess whether any operator in those markets is individually or jointly dominant, and where competition law remedies are insufficient to address the problems identified in our analysis.

[58] *Oftel's market review guidelines* (www.ofcom.org.uk/static/archive/oftel/publications/about_oftel/2002/smpg0802.htm)

4.7 Market share is an indicator of market power although the SMP Guidelines state that high market share alone is not sufficient to establish the possession of SMP. The SMP Guidelines further state that, in the Commission's practice, single dominance normally arises where market shares are over 40 per cent, and that in established case law, market shares of over 50 per cent are taken as evidence for the presumption of a dominant position. This presumption of dominance is rebuttable and a thorough and overall analysis is required before coming to a conclusion on the existence of SMP. Non-exhaustive criteria are suggested to measure the power of a market undertaking.

4.8 Where a market is found to be effectively competitive, then no SMP conditions can be imposed. In that case, we are also required to revoke any SMP condition in that market that applies to a provider that was designated as having SMP on the basis of an earlier analysis.

Criteria used in assessing SMP in the markets for WLA services

4.9 We have considered the criteria for the assessment of SMP contained in the Commission's guidelines and the ERG working paper on SMP and identified those that are most relevant for the WLA market, those that are less relevant and those that are not relevant.

4.10 We regard the following criteria as most important:

- Market shares;
- Barriers to entry and expansion;
- Economies of scale and scope; and
- Countervailing buyer power.

4.11 We also consider the following criteria to be somewhat relevant to the assessment of SMP in WLA markets. We note there is significant overlap with the most important criteria, in particular many of the following constitute a barrier to entry and expansion:

- Overall Size of the Undertaking;
- Control of infrastructure not easily duplicated;
- Technological advantages or superiority;
- Absence of or low countervailing buyer power;
- Easy or privileged access to capital markets;
- Product/service diversification;
- Economies of scale;
- Economies of scope; and
- Vertical integration.

Current market power designations in the WLA market

4.12 In the last WLA market review in 2004, we concluded that:

- KCOM holds a position of SMP in the Hull Area; and
- BT holds a position of SMP in the UK excluding the Hull Area.

4.13 The review concluded that BT had SMP on the basis that it had an 85 per cent share of relevant connections and that this had remained stable for 6 successive quarters. Furthermore, the cable network only covered around 50 per cent of premises and was split between two companies (ntl and Telewest) who were suffering financial difficulties. The review also noted that barriers to entry made it unlikely that a new entrant would emerge within the forward look of the review, and buyer power was low, with no purchaser having a credible threat to move away from BT.

Market power assessment for the United Kingdom excluding Hull

4.14 This section conducts a market power assessment for WLA in the United Kingdom, excluding Hull. The general structure of the analysis follows that contained in the 2004 WLA market review, reflecting the fact that the most relevant indicators of SMP in the WLA market remain unchanged. No development since 2004 suggests a greater or lesser weight should be paid to any particular element of the analysis. The section first considers evidence of market power based on current market share data before considering the possibility for new entry to constrain operators. It then considers the other factors that create or are indicative of market power as listed in paragraph 4.11.

4.15 Because BT is significantly larger than Virgin Media on a market share basis, and as the latter is present in only around half the country, we do not consider that there is any realistic chance that joint dominance (i.e., tacit collusion) exists in the market. As set out below, we estimate that Virgin Media has a market share of 16 per cent compared to BT's 84 per cent, (though see the discussion below for some caveats in interpreting market shares). Given its relative size and its coverage, Virgin Media can pose no threat to the majority of BT's customer base and as a result it is immediately apparent that Virgin Media would have little ability to induce cooperation through the implicit threat of a price war. Given this lack of a sufficient punishment mechanism to induce cooperation from BT, the potential for joint dominance vanishes and it is not necessary to consider additional factors such as price transparency, countervailing buyer power or the threat of entry. As a result, we do not think it is necessary to consider in detail these and other criteria contained in Annex 2 of the Framework Directive.

4.16 Similarly, we regard it as clear that Virgin Media does not have SMP in the market. Its market share of 16 per cent is well below the level at which a firm can be regarded to have market power (usually taken as 40 per cent) and in addition its network only has coverage in half the country. Although Virgin Media will have a more substantial presence within its network footprint if this is considered on a stand-alone basis, because we have argued that BT would set prices nationally it is the national market shares that give the best indication of market power. In particular national market shares indicate the extent to which BT would feel constrained by Virgin Media when setting prices.

4.17 Consequently this section only considers whether BT has SMP in the United Kingdom, excluding the Hull Area and whether KCOM has SMP in the Hull Area.

WLA market in the absence of existing remedies

4.18 As noted above, the Commission's framework for market reviews requires the adoption of a 'modified Greenfield approach' meaning that existing SMP remedies that apply to the market under consideration, or to those markets downstream, should be set aside. In paragraphs 3.77–3.79, we set out our views on the implications of this for the WLA market, and we take this into account in the following SMP analysis.

Market Shares

4.19 In the WLA market, competition in the UK (excluding Hull) comprises BT's copper network competing in approximately half the country with Virgin Media's cable access network.

4.20 Market shares are usually an important element of a market power assessment, and played an important role in the analysis conducted in the 2004 WLA market review. As in that review, we assess market shares in the WLA market on a volume basis, reflecting the fact that the bulk of wholesale supply at present is subject to regulation that heavily influences prices.

4.21 Based on information received through requests to the relevant operators, we estimate that current markets shares, defined as percentage of active lines, are as set out in Figure 4.1.

Figure 4.1 Estimated market shares in UK (excluding Hull), September 2009

Operator	Market share (of active lines)
Virgin Media	16%
BT	84%

Source: BT and Virgin Media

4.22 The previous market review found that ntl and Telewest had a combined market share of 15% in 2003. Figure 4.1 suggests that, despite the merger of the two cable networks and the upgrade of the cable network, BT's relative position in the market has remained largely unchanged.

4.23 A slight caveat is warranted, since a lot of BT's volumes are now supplied via LLU operators who were not present in the market in 2004 and, under the modified Greenfield approach, we need to consider the market in the absence of mandated LLU access for the purposes of the SMP assessment. In particular, we estimate that 36 per cent of BT's volumes in the cable area are supplied by full or shared LLU. Entrants who compete on this basis in cable areas are likely to win customers from Virgin Media as well as BT and this will depress the market share of the cable

network compared to a situation where there is no regulated access. Even if some wholesale supply continued, in the absence of regulation, we would expect the contractual terms under which it is supplied to limit the downstream pricing aggressiveness of the relevant operator[59]. It is possible that had LLU-based entry not occurred Virgin Media could have, to some extent, taken the place of LLU operators and, in an environment of growing demand for broadband services, won market share at the expense of BT.

4.24 Given the very hypothetical nature of the exercise, we have not attempted to forecast what market shares would be in cable areas in the absence of SMP remedies. However, as long as BT retains a good presence in cable areas it will have a significant market share on a national basis. If we were to assume that Virgin Media would be unlikely to account for more than half of the market within its network footprint, we can expect BT's market share would be roughly somewhere between 75 and 84 per cent on a national basis. Even if we assumed that Virgin Media could capture up to two thirds of the market in cable areas, BT would still have a market share of between 66 and 84 per cent on a national basis.

4.25 There are a number of reasons why we might expect BT's market share to be at the upper end of these ranges:

- As discussed in more detail below, BT may also have advantages stemming from its nationwide network and relative size that help it compete against Virgin Media;
- Many consumers may be reluctant to move their phone line away from BT, for example because of worries about service quality. We note that a significant proportion of the LLU lines have shared rather than full access; and
- Unlike LLU, switching to Virgin Media often requires an engineer visit and furthermore, as there is no industry migration process, risks either a period of no service or paying for duplicate supply.

4.26 Even accounting for the impact of LLU in depressing Virgin Media's market share the fact remains that BT is by far the larger firm in terms of market share. This provides a strong indication that BT enjoys a position of SMP in the market. Traditionally, a market share above 50% is accepted as leading to a presumption of SMP. Not only does BT exceed this by some margin, but the cable network is only present in around half of the country limiting the degree to which it can constrain BT's actions. Furthermore, even within the cable area BT has a very strong presence; we estimate that BT accounts for between 66 and 71 per cent of active lines within the cable area. Given our conclusion that there exists a common pricing constraint, national market shares are the correct ones to use in order to assess market power, however even when considered on a stand-alone basis market shares in the cable area suggest BT is in a strong position relative to Virgin Media.

Future market shares

4.27 Within the cable area, there is a lack of capacity constraints and at least the potential for either firm to expand its market share. Both Virgin Media and BT have ubiquitous coverage and could potentially supply any customer. In addition, having already sunk significant investment in infrastructure neither is subject to capacity constraints that

[59] For example, the use of two-part tariffs can achieve this effect since a high per unit wholesale price removes the incentive to price aggressively downstream. While, the two parties would negotiate over the fixed element of the agreement we could expect consensus on the per-unit element.

would limit its ability to supply a greater proportion of the market (though the factors mentioned in paragraph 4.25 do suggest some barriers to switching from BT to Virgin Media, which could act as a barrier to expansion).

4.28 Outside the nearly 13 million premises in the coverage area of the cable network, however, Virgin Media has limited potential to compete with BT since this would require new investment. As discussed below there remain significant barriers to entry in the WLA market and these would also apply to expansion by Virgin Media into new geographic areas.

4.29 Given that the market share for the cable network has not shown any significant change since the last market review in 2004, and given that the cable network is currently limited to around half of the country, we consider that the market shares set out above are not likely to change over the next four years in a way that would affect our conclusions regarding BT's position in the market. However, we recognize it is possible that Virgin Media could make some gains during the forward look of this review. We understand that Virgin Media has plans to expand its network footprint, using a variety of approaches, including the use of telegraph poles. Our understanding is that at present only trials are being conducted and there is no certainty about the scale of any future investment. In any case, the investment is unlikely to be enough to reduce BT's market share on a national basis by a significant amount.

Entry and barriers to entry

4.30 The potential for entry is important for two reasons: first, it determines whether the existing market structure is likely to remain unchanged in the future (or following the hypothetical removal of existing remedies) and second, where entry is relatively rapid the threat of entry may constrain the current behaviour of incumbents. Given the time required to enter the market, the second is less relevant for this review as it requires entry to be fast enough that the entrant can win market share before the incumbent can adjust their behaviour in response. This is more likely for longer-term decisions such as network investment than for pricing decisions, which are at the heart of market power analysis.

4.31 The 2004 WLA Statement considered a variety of factors that affect the ease of entry:

- The required scale of investment;
- Sunk costs;
- Economies of density;
- Benefits to ubiquity; and
- Vertical linkages (including economies of scope).

4.32 The 2004 WLA Statement concluded that new entry would involve significant upfront expenditure and would be extremely risky. Noting that fixed wireless was the most likely route for new entry the review concluded that this was unlikely to emerge in the near future. Having considered these factors again, our view is that these conclusions continue to hold. No technological or market developments suggest barriers to entry are any less significant. Although NGA rollout by a firm other than Virgin Media or BT is perhaps more of a possibility than in 2004, we regard it as

unlikely without supporting regulation allowing access to the existing infrastructure of the incumbents. However, to the extent that this regulation would be based on an SMP finding in the WLA market, it is not relevant for the current SMP assessment.

4.33 We understand that Virgin Media has some plans to expand its network footprint using telegraph poles as well as other approaches. As mentioned, there is currently no certainty about the scale of any investment. In any case, it is highly unlikely that this approach could be adopted by a new operator not already present in the market. Virgin Media has already sunk significant investment in its network and built up a strong brand. It is unlikely a new entrant would invest in this way.

Countervailing buyer power

4.34 A concentrated market need not lead to harmful outcomes if buyers themselves possess a degree of countervailing power. Although retail customers are unlikely to have any market power, wholesale purchasers may have a degree of buyer power where they purchase large volumes and have a credible threat to switch supplier, either from BT to Virgin Media (or vice versa) or to self-supply. However, a purchaser of WLA would need to build its own infrastructure to connect that of the access provider and once done switching to another provider would be difficult. Existing wholesale purchasers (LLU operators) have already built their networks to connect with BT and a switch to a cable access product would be difficult. Consequently we do not consider that countervailing buyer power would affect our market power findings in this market. An entirely new purchaser buying WLA products in the cable area may have some degree of buyer power where it can bargain simultaneously with both BT and Virgin Media but we are not aware of any such purchasers emerging and hence we consider that this possibility does not affect our analysis.

Analysis of other criteria

4.35 The above analysis has considered those criteria that we consider most important for the assessment of SMP. In this section we consider those that are relatively less important. The Commission's guidelines on the assessment of market power for the communications networks and service and the ERG's working paper on SMP list a number of additional criteria.[60] In paragraph 4.11 above we set out those that we consider relevant to some degree. These are now discussed in turn:

- Overall Size of the Undertaking – BT is a larger firm than Virgin Media though both are sizable. In our previous review, we argued that this factor mainly affects competition via access to capital, which is considered below, and we also follow this approach here;

- Control of infrastructure not easily duplicated – This criteria has been dealt with under barriers to entry. BT's network covers the entire UK, excluding Hull. Virgin Media has already constructed access networks in the cable area, but would find expansion costly and risky;

- Technological advantages or superiority - Virgin Media has an upgraded cable access network capable of delivering much higher broadband speeds than BT (as well as the ability to supply pay TV). There is no evidence as yet that this has given Virgin Media any significant advantage over BT in cable areas with and, in any case, BT is planning to invest in its own network upgrades over the next few years with a target of reaching 40 per cent of homes with high speed broadband

[60] See SMP Guidelines, paragraph 78

by 2012. Whatever the relative strengths of the two networks, as discussed in Section 3 on product market definition, we consider that higher speed services are part of the same market as standard broadband, and the latter are therefore able to constrain the pricing of the former. A technological advantage will help an operator compete but will not necessarily allow it to act independently of its rival;

- Easy or privileged access to capital markets – Both firms appear to have good access to financing and there is no reason to believe this would be an impediment to competition, especially in a scenario where existing remedies are absent and profitability in general is higher;

- Product/service diversification – At the wholesale level, the services are reasonably differentiated from the perspective of a wholesale purchaser, with Virgin Media's network being based on different technology. At the retail level there is significant scope for diversification between the two firms with Virgin Media in particular being able to offer bundles incorporating pay TV and higher speed services. BT is able to offer services via the existing phone line which some customers may value, and as it rolls out its NGA network there is the potential for the quality of these services to improve;

- Economies of scale – As mentioned above, the 2004 WLA Statement concluded that there are significant economies of scale associated with operating an access network. The main effect is to create a barrier to entry and this has been discussed above. However, economies of scale also make investment in any centralised activity such as R&D and marketing more cost effective, which can help a larger firm compete for market share. BT may have an advantage here, since its ubiquitous network allows it to spread costs over a much larger volume of customers;

- Economies of scope – Compared to BT, Virgin Media may benefit from economies of scope across its product range, particularly with respect to pay TV, though we note BT's presence in the pay TV market and its potential to expand particularly if it obtain greater access to content; and

- Vertical integration – BT has a full vertically integrated network, from local access upstream to retail activities downstream. Virgin Media also has an integrated operation including retail and upstream activities.

4.36 The above criteria highlight certain advantages that both Virgin Media and BT might have in the WLA market, the former with respect to its upgraded network and superior ability to offer bundles at the retail level, the latter with respect to its national network and greater size. In evaluating the net effects of these we note that the advantages possessed by both Virgin Media and BT ought to be reflected to a large degree in their current market shares and hence are already partially captured in the analysis presented in that section.

4.37 Having said that, an SMP analysis cannot be conducted on market shares alone and it is necessary to consider in more detail the impact that Virgin Media and BT's advantages might have on the nature of competition in the market. Virgin Media's ability to offer larger bundles at the retail level and its technologically superior network might suggest its products are not regarded as close substitutes by some customers and that it serves a specific segment of the market (i.e., those with strong preferences for bundled pay-TV services or for high speed broadband). However, our analysis of the product market in Section 3 suggests that neither of these factors is

enough that Virgin Media and BT's products are regarded as unsatisfactory substitutes by a significant proportion of customers at the retail level.

4.38 BT's ability to spread fixed costs over its national network may give it a cost advantage when investing in various centralised activities such as marketing and also, potentially, lower production costs. This would increase BT's ability to act independently of Virgin Media.

4.39 Overall, having considered the criteria, we consider that there are no features of the market that would overturn or modify the conclusions based on a market share analysis. Both BT and Virgin Media possess certain strengths, and on balance there is no reason to think that Virgin Media has an ability to 'punch above its weight' and constrain the actions of BT despite its limited presence in the market.

Proposal on SMP in the UK (excluding Hull)

4.40 Based on the above analysis, we propose that BT has SMP in the WLA market in the UK, excluding the Hull Area. Virgin Media's ability to constrain BT is limited by the fact that its footprint only covers around half of the country. Based on this and the corresponding market share that BT has on a national basis we consider that BT is able to act to an appreciable extent independently of Virgin Media. We do not consider it likely that this will change during the future period covered by this review, since the potential for new entry is limited. While we understand that Virgin Media has plans to expand its network there is no certainty at present as to the scale and, in any case, we consider that it is unlikely to be of a large enough scale to make a significant impact on BT's national market share.

Market power assessment for the Hull Area

4.41 As KCOM has a 100 per cent market share in within the Hull Area, a market power assessment needs only to consider the likelihood of or potential for new entry and whether there is countervailing buyer power.

Barriers to entry

4.42 As with the rest of the UK, there are significant barriers to entry in the Hull Area, stemming from the economies of scale and the risks associated with the large cost of building an access network. BT is perhaps the most likely entrant but still is unlikely to find it profitable given the fixed and sunk costs associated with building an access network in the Hull Area.

Countervailing buyer power

4.43 A purchaser of WLA inputs in the Hull Area would have little buyer power since, no matter how large the buyer, it would have no option other than to purchase wholesale inputs from KCOM.

Proposal on SMP in the Hull Area

4.44 Based on its monopoly position, the significant barriers to entry and the lack of buyer power, we propose that KCOM has SMP in the WLA market in the Hull Area. Given the costs of investing in the Hull Area, we consider that it is not likely that this will change during the future period covered by this review. We are not aware of any firm plans by OCPs to invest in local access infrastructure in the Hull Area.

Consultation question

Question 3 Do you agree with our proposals that BT and KCOM have SMP in their respective geographic markets? If not, please explain why.

Section 5

Approach to remedies

Introduction

5.1 This is the first of five sections that cover our proposals on SMP remedies. These sections are set out as follows:

- This section is an introduction to our assessment of the regulatory remedies that we are proposing should apply to BT in the UK (excluding Hull) and to KCOM (in the Hull Area only);
- Section 6 describes proposals on a number of general SMP remedies that do not involve specific access products (e.g., LLU). Such general remedies, including a requirement to provide reasonable network, are often imposed on SMP providers and provide a set of basic rules for such CPs, to constrain their SMP;
- Section 7 covers our assessment of each specific access product that could supplement the general remedies;
- Section 8 presents our proposals on the combination of specific access remedies that should apply to BT. It also covers some related issues, including the approach towards non-SMP providers of WLA services, and how SMP regulations relate to public funding; and
- Section 9 sets out how our proposals on specific access requirements meet the related legal tests for imposing these obligations.

5.2 This section covers the following issues:

- The current remedies in the WLA market; and
- The legal framework for assessing remedies.

The current WLA remedies

5.3 In the 2004 WLA market review, we imposed regulatory obligations on both BT and Kingston Communications (now KCOM) as remedies for their SMP in different geographic areas.

5.4 In that review, we imposed the following specific and general regulatory obligations on BT in the WLA market, and in respect of co-location, in the UK excluding the Hull Area:

- Local loop unbundling (LLU), including charge ceilings for certain elements of the LLU service;
- Sub-loop unbundling (SLU);
- Requirement to provide Network Access on reasonable request;
- Requests for new Network Access;

- Requirement not to discriminate unduly;
- Basis of charges (i.e., cost orientation);
- Requirement to publish a reference offer;
- Requirement to notify charges, terms and conditions;
- Transparency as to quality of service;
- Requirement to publish technical information; and
- Requirement for cost accounting and accounting separation.

5.5 In November 2005[61], further ceilings were imposed on the fully unbundled rental charge for LLU. In May 2009 the various LLU charge ceilings were replaced by formal charge controls up to 31 March 2011[62].

5.6 Also in the 2004 WLA market review, we imposed the following obligations on KCOM in the WLA market, and in respect of co-location, in the Hull Area:

- Requirement to provide Network Access on reasonable request;
- Requirement not to discriminate unduly;
- Basis of charges (i.e., cost orientation);
- Requirement to publish a reference offer;
- Requirement to notify charges, terms and conditions; and
- Requirement to publish technical information.

The legal background to SMP remedies

5.7 We set out in Annex 5 the relevant legal issues that we need to consider when we assess the introduction of potential SMP remedies. We have considered all of these requirements in presenting our analysis and proposals on remedies in Sections 6 to 9 of document. Here we summarise some of the main issues.

5.8 The Framework Directive provides that *ex ante* regulation should be imposed only where there is not effective competition (i.e., where one or more providers has SMP) and where competition law remedies are not sufficient to address the perceived problem. We consider this issue in Section 6.

5.9 The SMP Guidelines state that NRAs must impose one or more SMP remedies on a dominant provider, and that it would be inconsistent with the objectives of the Framework Directive not to impose any SMP remedies on such a provider.

[61] See LLU: setting the fully unbundled rental charge ceiling and minor amendment, 30 November 2005, http://www.ofcom.org.uk/consult/condocs/llu/statement/llu_statement.pdf
[62] See A new pricing framework for Openreach, http://www.ofcom.org.uk/consult/condocs/openreachframework/statement/statement.pdf

5.10 In assessing which SMP remedies are suitable, and in what form, we need to consider our duties under the Act. Section 3 of the Act sets out our general duties. Our principal duty, set out in section 3(1) of the Act, is to further the interests of citizens in relation to communications matters and consumers in relevant markets, where appropriate by promoting competition.

5.11 The Act also sets out the obligations that we can impose if we find that any undertaking has SMP, and the legal tests that each SMP remedy must meet. These legal tests are considered explicitly in Section 6 and Section 9 of this document. They include the requirements that SMP services conditions must be appropriate (section 87(1) of the Act). Also, SMP services conditions must satisfy the tests in section 47(2) of the Act. Those tests are that each condition must be:

- objectively justifiable in relation to the networks, services or facilities to which it relates;
- not such as to discriminate unduly against particular persons or a particular description of persons;
- proportionate to what the condition is intended to achieve; and
- in relation to what it is intended to achieve, transparent.

Impact assessments

5.12 As set out in Annex 5, we are required to carry out an assessment of the prospective impact our proposals, as part of best practice policy-making. The sections of the document that cover remedies particularly relate to this impact assessment.

5.13 We also have equality impact assessment (EIA) requirements, to assess the potential impacts of our decisions on race, disability and gender equality. It is not apparent to us that the outcome of our review is likely to have any particular impact in these respects. Nor do we envisage a need to carry out separate EIAs in relation to race or gender equality or equality schemes under the Northern Ireland and Disability Equality Schemes. This is because we anticipate that our regulatory intervention will not have a differential impact on people of different gender or ethnicity, on consumers in Northern Ireland or on disabled consumers compared to consumers in general. Similarly, we are not envisaging making a distinction between consumers in different parts of the UK or between consumers on low incomes.

Section 6

General remedies

Introduction

6.1 In this section we set out our proposals for applying a number of general remedies designed to address BT's and KCOM's proposed SMP in the WLA market. By general remedies, we mean ones that do not involve specific access products, such as LLU. Our proposals on those specific access products are covered in Sections 7 to 9.

6.2 As our analysis in Section 4 has shown, we consider that reliance on competition law alone would not address the competition concerns we have identified in this market. It follows that our starting point when considering the various regulatory options is that some form of ex ante regulation must be imposed.

6.3 Where it is not feasible for competing providers to replicate a dominant provider's network, the most general remedy to address SMP is an obligation requiring a dominant provider to make network access available to OCPs on reasonable request.

6.4 In addition to a network access obligation, a number of other complementary general access remedies can be imposed on SMP providers, where the market analysis identifies competition concerns that a general network access obligation alone would be insufficient to address. There is discretion in how these general remedies can be applied, but when taken together they are designed to provide a basic framework for dominant providers to follow, which constrains them from behaving in a way that would exploit their SMP.

General remedies on BT and KCOM

6.5 We discuss below each of the following possible SMP services conditions that we are proposing to continue to apply to BT and KCOM. Figure 6.1 below summarises the general remedies that currently apply to BT and KCOM.

Requirement to provide network access on reasonable request

6.6 We are proposing to retain the existing SMP obligation requiring BT and KCOM to provide network access to their networks to Third Parties upon reasonable request.

6.7 Section 87(3) of the Act authorises Ofcom to set SMP services conditions requiring the dominant provider to provide network access as Ofcom may from time to time direct. These conditions may, pursuant to section 87(5), include provision for securing fairness and reasonableness in the way in which requests for network access are made and responded to and for securing that the obligations in the conditions are complied with within periods and at times required by or under the conditions. When considering the imposition of such conditions in a particular case, Ofcom must have regard to the six factors set out in section 87(4) of the Act. These include, inter alia, the technical and economic viability of installing other competing facilities and the feasibility of the proposed network access.

Figure 6.1 Current general access remedies in the WLA market (imposed 2004)

Remedies on BT	Remedies on KCOM
• Requirement to provide network access on reasonable request; • Requests for new network access; • Requirement not to unduly discriminate; • Basis of charges (i.e., cost orientation); • Requirement to publish a reference offer; • Requirement to notify charges and terms and conditions; • Requirement to notify technical information; • Quality of service; and • Requirement for cost accounting and accounting separation.	• Requirement to provide network access on reasonable request; • Requirement not to unduly discriminate; • Basis of charges (i.e., cost orientation); • Requirement to publish a reference offer; • Requirement to notify charges and terms and conditions; and • Requirement to notify technical information.

Aim and effect of regulation

6.8 As our analysis in Section 4 has shown, the level of investment required by a third party to replicate BT and KCOM's networks to build sufficiently large access networks to compete at this level is a significant barrier to entry. In our view an obligation requiring dominant providers to make access to their network facilities available to third parties on reasonable request would assist in promoting competition in downstream retail markets. We consider that in the absence of such a requirement, the dominant provider would have an incentive not to provide access to preserve its position of market power.

6.9 Network access is defined in sections 151(3) and (4) of the Act and includes interconnection services and/or any services or facilities that would enable another CP to provide electronic communications services or electronic communication networks. We consider that a requirement to provide network access would, therefore, include any ancillary services as may be reasonably necessary for a Third Party to use the services[63]. Third Party has been defined as a person providing a public electronic communications network or a public electronic communications

[63] In the 2004 WLA market review we identified co-location as a technical area which the SMP obligations also applied

service, which captures OCPs who are seeking to compete against the dominant providers.

6.10 This obligation is set out as Condition FAA1 and FBB1 for BT and KCOM respectively in our Notification in Annex 6 and would apply to the proposed WLA markets in which our preliminary conclusion is that BT and KCOM have SMP.

6.11 The proposed SMP condition also includes the power for us to make directions. This power would be used, where appropriate, to secure fairness and reasonableness in the terms, conditions and charges for providing third parties with network access. The condition includes a requirement for the dominant provider comply with any such directions, so any contravention of a direction may therefore result in a contravention of the condition itself and would then be subject to enforcement action under sections 94-104 of the Act.

Legal tests

6.12 We are satisfied that that the proposed condition (Conditions FAA1 and FBB1 for BT and KCOM, respectively, at Annex 6) meets the various tests set out in the Act.

6.13 First, we have considered our duties under section 3 and all the Community requirements set out in section 4 of the Act. In particular, the condition is aimed at promoting competition and securing efficient and sustainable competition for the maximum benefits for consumers by facilitating the development of competition in downstream markets.

6.14 Second, section 47 requires conditions to be objectively justifiable, non-discriminatory, proportionate and transparent. The proposed condition is:

- objectively justifiable, in that it facilitates and encourages access to BT's and KCOM's networks and therefore promotes competition to the benefit of consumers;
- not unduly discriminatory, as it is proposed on both BT and KCOM and no other operator has been found to hold a position of SMP in these markets;
- proportionate, since it is targeted at addressing the market power that we propose BT and KCOM hold in these markets and does not require them to provide access if it is not technically feasible or reasonable; and
- transparent in that the condition is clear in its intention to ensure that BT and KCOM provide access to their networks in order to facilitate effective competition.

6.15 Finally, we have taken into account the factors set out in section 87(4). In particular, we believe the condition is necessary for securing effective term competition in the long term, having considered the economic viability of building a local access network to achieve ubiquitous coverage that would make the provision of network access unnecessary and the technical feasibility of the proposed network access.

Requests for new Network Access

6.16 Consistent with our approach in the recent review of the wholesale narrowband market review we believe it is appropriate to retain the substantive elements of the request for new network access condition (also known as the statement of requirements (SOR)) as an accompaniment to the proposed obligation on BT to meet

all reasonable requests for new network access (effectively requests for new products). However, we also think that it is appropriate to extend the request for new network access so that it applies with respect to KCOM in the Hull Area.

Aim and effect of regulation

6.17 In the 2004 WLA market review we said that regulation was considered appropriate to give OCPs clarity and certainty about the process for requests for new network access and also to allow BT to set a reasonable standard for requests and reject inadequate requests. We said it would also assist in dispute resolution as the nature of disputes would be clearer.

6.18 We considered that requests for new network access should cover modifications of existing network access[64] and completely new forms of network access.

Existing regulation

6.19 The existing condition requiring BT to provide new network access (FA8) is proscriptive and reflected Ofcom's concerns at the time to give the industry greater certainty about timings and to minimise the potential for delays by BT.

6.20 Since 2004 the SOR process has been formalised through BT's Undertakings and it applies to both Openreach and BT Wholesale. The processes have been further developed over time with industry input and a working group is in place to propose more improvements to the SOR process as appropriate.

Proposed regulation

6.21 Rather than re-impose the existing condition FA8, we are proposing to adopt the form of new network access condition set on BT in the wholesale narrowband market review in 2009. Proposed conditions FAA2 and FBB2, for BT and KCOM respectively, are similar to the existing condition in that they allow BT and KCOM to develop the SOR in line with a number of principles, but they do not proscribe specific timings for the process.

6.22 The condition we propose to impose would require BT and KCOM to have in place, and follow for each SOR, an SOR process which:

- is documented end-to-end and this documentation is available to CPs;
- has reasonable timescales for each stage of the process;
- clearly identifies the criteria by which a SOR would be judged;
- sets out the information that should be provided in order for an SOR to be accepted; and
- changes should be agreed between BT/KCOM and industry.

6.23 While we consider that the SOR process set out in FA8 and Annex 3 of the 2004 WLA Statement also meets these criteria, our view is that taking a more general

[64] This did not extend to general requests for modifications not associated with specific requests for network access, such as requests to modify general contractual terms, but did cover requests for a new pricing structure or the provision of certain billing information.

approach, like the one we are proposing in FAA2 and FBB2, would allow changes to be made to the existing process as needed, where these changes are agreed by industry and BT/KCOM.

6.24 We acknowledge that the current and anticipated level of demand for new network access in the Hull Area is minimal, as was the case in the last review. This time, we have observed a greater general level of interest from a range of OCPs for new networks and emerging services. We therefore consider that it is justified to require KCOM to create an SOR process, which may assist the development of new network access in the Hull Area. KCOM would have discretion in developing a process according to the principles in the condition (and it could also draw upon the existing SOR established by BT).

Legal tests

6.25 Section 87(3) of the Act authorises the setting of SMP services conditions in relation to the provision of network services. We consider that that under section 87(5)(a), the proposed condition would assist in securing fairness and reasonableness in the way in which requests for new network access are made and responded to. The condition provides a framework for agreeing and implementing improvements to the existing system, while retaining a 'safety-net'.

6.26 Having considered the Community requirements set out in section 4 of the Act, we believe that the proposed condition meets the requirements. Specifically, section 4(8), as it has the purpose of securing efficient and sustainable competition in the markets reviewed.

6.27 We consider that the proposed condition meets the criteria set out in section 47(2) of the Act. The proposed condition is:

- objectively justifiable as it recognises that a process for handling new requests is needed but that the obligation should be flexible to allow for process improvements to be adopted as agreed between BT/KCOM and industry;
- not unduly discriminatory as it only applies to providers with SMP;
- proportionate as it continues to provide a SOR process based on the currently implemented process, while allowing scope for industry to be involved in agreeing process improvements and in the case of KCOM it would not be an onerous burden to set out an initial SOR process; and
- transparent in that the condition is clear in its intention to set out a SOR process and to ensure that changes to BT and KCOM's SOR process are reflective of industry feedback.

Requirement not to unduly discriminate

6.28 We are also proposing to retain the condition on BT and KCOM not to unduly discriminate, in order to support the provision of general network access in this market. In relation to the proposed non-physical WLA product(s) (VULA), we are proposing a more rigorous form of no undue discrimination. Paragraphs 7.262-7.264 discuss this stricter interpretation, and why we consider it to be appropriate.

6.29 Section 87(6)(a) of the Act authorises the setting of an SMP services condition requiring the dominant provider not to unduly discriminate against particular persons,

or against a particular description of persons, in relation to matters connected with the provision of network access.

Aim and effect of regulation

6.30 Where vertically integrated SMP providers like BT and KCOM are required to provide network access to third parties, there are incentives for them to provide the requested wholesale network access services on terms and conditions that discriminate in favour of their own downstream activities in such a way as to have an adverse effect on competition. In particular, there are incentives to charge competing providers more for wholesale services than the amount charged to their own downstream activities thereby increasing the costs to competing providers and providing themselves with an unfair competitive advantage. They might also provide services on different terms and conditions, for example with different delivery timescales, which would have the effect of disadvantaging competing providers.

6.31 A requirement not to unduly discriminate is therefore intended as a complementary remedy to the network access obligation, principally, to prevent dominant providers from discriminating in favour of their own downstream activities and to ensure that competing providers are placed in an equivalent position.

6.32 It could be argued that a complete prohibition of discrimination would result in the SMP operator providing exactly the same products and services to all CPs (including its own downstream divisions) on the same timescales, terms and conditions (including price and service levels), by means of the same systems and processes and by providing the same information. Essentially, the inputs available to all CPs (including the SMP operators' own downstream divisions) would be provided on a truly equivalent basis, an arrangement which has become known as Equivalence of Inputs (EoI) within the scope of BT's Undertakings.

6.33 Whilst this interpretation of no undue discrimination may seem like a good framework for promoting competition, it is possible that there would be practical issues and cost implications associated with its implementation. For example, it may require the dominant provider to re-engineer existing products and processes, which could be both costly and disruptive. We recognise therefore that a prohibition of discrimination might have disadvantages if it prevented discrimination that was economically efficient or justified.

6.34 Our intention with this proposed general remedy is that a prohibition of undue discrimination is not a blanket prohibition on all forms of discrimination; some forms of discrimination may not raise concerns. However, we would expect differences in the treatment of undertakings to be objectively justifiable, for example, on the basis of differences in underlying costs of supplying different undertakings.

6.35 We propose that the no undue discrimination obligation applies to the WLA markets in which BT and KCOM have been found to have SMP.

Legal tests

6.36 Ofcom considers that the condition (Conditions FAA3 and FBB3, for BT and KCOM respectively, at Annex 6) meets the tests set out in the Act.

6.37 We have taken account of our duties under section 3 and all the Community requirements set out in section 4 of the Act. In particular, we consider that the condition is aimed at promoting competition and securing efficient and sustainable

competition for the maximum benefit of consumers, by preventing BT and KCOM from leveraging their SMP into downstream markets.

6.38 We also consider that the proposed condition meets the criteria set out in section 47 of the Act, and that the proposed conditions are:

- objectively justifiable, in that it provides safeguards to ensure that competitors, and hence consumers, are not disadvantaged by BT or KCOM discriminating in favour of their own downstream activities or between different competing providers;
- not unduly discriminatory, as BT and KCOM are currently the only SMP operators that we have proposed have SMP in these markets;
- proportionate since it only seeks to prevent undue discrimination; and
- is transparent in that the condition is clear in its intention to specify the basis on which BT and KCOM should network access available to itself and competing CPs.

Pricing remedies

6.39 Another important general remedy that supports the obligation on dominant providers to provide network access to third parties are those that relate to pricing. These remedies can be more intrusive than the ones already discussed, but where justified they can facilitate effective competition in downstream markets by limiting BT's ability to set charges at an excessive level.

6.40 Section 87(9) authorises the setting of charge controls in relation to matters connected with network access.

Basis of charges

6.41 Section 87(9) of the Act authorises the setting of SMP service conditions imposing rules regarding the recovery of costs and cost orientation. We are proposing to retain the basis of charges condition that currently applies to BT and KCOM in relation to the general network access obligation discussed above.

6.42 If we were to impose a basis of charges condition on BT, our view would be that the interpretation of the basis of charges obligation would be that BT's prices must, as a first-order test, be between DLRIC[65] and DSAC[66], BT would be required to adjust its prices to comply with the obligation if its current pricing was outside this range. As such, BT's prices would be constrained based on the costs it incurred.

Aim and effect of regulation

6.43 In a competitive market, the pricing of services on the basis of the commercial judgements of individual companies could be expected to deliver cost-reflective pricing. However, where competition cannot be expected to provide effective pricing constraints, ex ante regulation is desirable to prevent excessive pricing. Such intervention should also have as its objective the aim of moving the market towards a position where effective competition is realised. Where the competition problem

[65] Distributed Long Run Incremental Cost.
[66] Distributed Stand Alone Costs.

arises at an upstream stage in the production chain, it is likely to be appropriate to regulate the pricing of wholesale inputs, in order to allow effective competition to develop in downstream markets, rather than control downstream prices themselves.

6.44 In markets where competition is not effective, dominant providers are likely to set excessive prices, in order to maximise their profits and, where the dominant provider is vertically integrated, to increase the costs of competing providers. Higher wholesale charges are likely to mean higher retail prices which would be detrimental to consumers.

6.45 Important in our consideration of the appropriate form of price regulation is the issue of efficiency and how efficiency would be impacted by the presence of or lack of effective price regulation. In considering efficiency we need to be aware of the three broad types of efficiency: allocative efficiency, productive efficiency and dynamic efficiency. Allocative efficiency refers to the manner in which resources are allocated and tends itself to the principle that prices should reflect costs, including that any common costs are recovered in a way that minimises distortions. Productive efficiency refers to minimising the cost of production. Dynamic efficiency refers to the promotion of sustainable investment and entry. It might be that different pricing approaches would require trade-offs of these types of efficiency to be made.

6.46 Different pricing approaches include:

- cost-based pricing, e.g., setting charges based on long-run incremental costs or some other measure of cost; and
- using the efficient component pricing rule ("ECPR").

6.47 We briefly discuss each of these in turn below.

Cost-based prices

6.48 Typically, when we set charges based on cost in communications markets we reflect the long run incremental costs and include an additional mark-up to reflect the common costs of providing the service ("LRIC+"). This is the approach we adopted in 2004 when we last reviewed this market and is widely used by NRAs across Europe and the FCC in the United States. Essentially, this approach consists of setting the charges on a cost-oriented basis, where the costs included in the charges are:

- the forward-looking long run incremental costs efficiently and necessarily incurred by the regulated firm to provide the service to which the charge refers;
- an appropriate mark-up to allow the recovery of common costs[67]; and
- a reasonable return on the capital employed.

[67] The costs incurred in the production of two or more products can be classified as:
- incremental costs - those costs which are incurred directly as a consequence of producing a specific good or service (i.e., there is an unambiguous relationship between these costs and the good or service in question); and
- common costs – those costs which arise in the production of two or more goods or services, and which are not incremental to the production of any specific one of these goods or services.

6.49 Long run incremental costs may be defined in general as the costs that are caused in the long run by the provision of a defined increment of output. It can also be seen as the costs that the regulated firm would avoid if it decided not to provide the regulated services any longer, taking a long run perspective.

ECPR

6.50 The ECPR determines prices not on the basis of the underlying costs of providing the service, but sets a price based on the opportunity cost to the access provider of providing access to third parties. Under this approach the price would be composed of the incremental cost of providing access plus the profit that BT would forego by selling access to a competing downstream operator, rather than it selling the final service itself.

Proposed approach for basis of charges

6.51 As noted above, when considering different approaches we need to be aware of how the different approaches could impact economic efficiency and the different types of efficiency identified above. Setting charges based on cost (in particular when based on LRIC) with appropriate treatment of common costs would support an efficient outcome in terms of allocative efficiency. In addition such an approach would support dynamic efficiency as charges set on this basis would encourage efficient entry at the network level because they reflect replacement costs, which are the costs that would be faced by new entrants. Moreover, depending on the precise details of implementation, including on whether we also impose a charge control, which we discuss below, such an approach could also support productive efficiency.

6.52 If we were to set prices using the ECPR this would ensure that entry to downstream prices based on ECPR would be productively efficient as the entrant's incremental cost could not profitably be higher than BT's incremental cost of providing the downstream service. However, as this pricing approach would lead to prices that do not reflect costs and which do not seek to minimise costs, it would not support allocative efficiency. Moreover, dynamic efficiency is likely to be reduced as the resultant higher prices would deter at least some entry reducing competitive pressures.

6.53 We believe that, since competition in this market remains limited and as this is an established market, the main concern is that BT or KCOM might exploit their position of SMP to earn excessive profits. LRIC+-based charges correspond more closely to the charges that would occur in a fully competitive market and also encourage efficient entry at the network level.

6.54 Therefore, we consider that the most appropriate approach for a basis of charges obligation for network access and its application to existing specific services (LLU and SLU) and any new physical infrastructure access services (PIA) in the WLA markets in which BT and KCOM have been found to have SMP is LRIC+. We discuss below our approach to LLU, which we consider should continue to be subject to specific charge controls in addition to the proposed basis of charges obligation.

6.55 However, we do not believe that the proposed basis of charges obligation should apply in respect of certain new NGA services, for example we do not consider that the VULA product(s) in the WLA market should be subject to a LRIC+ control. These services differ from existing WLA products and services in that they are new, less established services and therefore have a higher degree of uncertainty attached to their provision. Moreover, we consider that the prices charged by BT for VULA would

be largely constrained from competition at the retail level by OCPs' continuing ability to purchase CGA services from BT on regulated terms and by the services offered by Virgin Media over its cable network. An attempt by BT to set excessively high prices would limit its ability to attract traffic to its NGA network, and thereby to recoup its NGA investment. We do not consider therefore that applying a LRIC+ obligation on VULA products is appropriate.

Legal tests

6.56 Ofcom considers that the proposed condition (Conditions FAA4 and FBB4 for BT and KCOM respectively, at Annex 6) meets the tests set out in the Act.

6.57 Ofcom has considered its duties under section 3 and all the Community requirements set out in section 4 of the Act. In particular, the condition is aimed at promoting competition and securing efficient and sustainable competition for the maximum benefit of consumers by ensuring that charges for wholesale services are set at a level that enable operators to compete downstream. For those reasons, we also consider that any pricing to be charged on a fair and reasonable basis under the proposed network access obligations would be appropriate in order to promote efficiency and sustainable competition and provide the greatest possible benefits to end users by enabling competing providers to buy network access at levels that might be expected in a competitive market.

6.58 Section 47 requires conditions to be objectively justifiable, non-discriminatory, proportionate and transparent. The proposed condition is:

- Both objectively justifiable and a proportionate response to the extent of competition in the markets analysed, as it ensures that BT and KCOM are unable to exploit their market power and enables competitors to purchase services at charges that would enable them to develop competing services to those of BT and KCOM in downstream markets to the benefit of consumers, whilst at the same time allowing BT and KCOM a fair rate of return that they would expect in competitive markets;

- not unduly discriminatory, as it is proposed for both BT and KCOM and no other operator has SMP in these markets; and

- transparent in that it is clear in its intention to ensure that BT and KCOM should set charges on a LRIC+ basis.

6.59 We also consider that the proposed condition satisfies the requirements of section 88(1) as our market analysis indicates that there is a risk of adverse effects arising from price distortion. Moreover, the proposed condition promotes efficiency and sustainable competition and provides the greatest possible benefits to end users by enabling competing providers to buy network access at levels that might be expected in a competitive market. The extent of investment of the dominant operator has been taken into account as set out in section 88(2), as the obligation provides for an appropriate return on the capital employed to be included in the charges. In addition the control only applies to existing products and services in this market, and not to new and less established NGA services in the market.

Charge controls

6.60 Section 87(9) of the Act authorises the setting of charge controls in relation to matters connected with network access.

6.61 The existing LLU charge control was imposed to address concerns identified in our previous market analysis and applies to BT for LLU services. That charge control continues to apply until it expires in March 2011.

Aims and effects

6.62 We have set out above that a basis of charges condition would act to constrain BT's pricing. However, due to BT having SMP in the market it is unlikely to be incentivised to reduce its costs and set prices at the competitive level. It would be likely to be able to recover higher costs through higher prices charged at the wholesale level, which would ultimately be passed on in higher retail charges. Therefore we are proposing that there should be a further LLU charge control to take effect when the current control expires in March 2011.

6.63 Imposing a charge control in addition to a basis of charges condition would address this as the charge control could be structured to incentivise efficiency improvements and/or investment by BT, which would be of benefit to all purchasers of LLU products (and, ultimately, could result in better products and lower prices for consumers). It would also provide more certainty over the life of the control period about the maximum level of LLU charges.

6.64 The charge control would result in prices being based on a forward-look view of the costs[68] related to provision of services at the end of the period, taking into account efficiency improvements and possible future investment by BT that would be of benefit to consumers and citizens.

Legal tests

6.65 From our market analysis, it appears that there is a risk that BT might set its prices for LLU at an excessively high level or margin squeeze. We do not consider that cost orientation alone would be appropriate in relation to LLU charges.

6.66 Whilst we will consult separately on this matter, we consider that in principle a charge control is additionally required for LLU to ensure that it provides the right incentives for BT to seek further efficiency savings. This should ultimately allow the benefits of lower costs to be passed on to consumers.

6.67 We are of the view that a charge control would promote efficiency by requiring BT to price at the level of an efficient firm in the absence of competitive constraints in this market. Depending on the specific form of control BT would likely be incentivised to improve its efficiency ahead of the efficiency improvements built into the charge control. It would also likely promote sustainable competition by only encouraging equally or more efficient CPs to compete based on LLU. It would also likely also promote sustainable competition at the retail level by restricting BT's ability to price excessively with the aim of making it more difficult for other providers to compete. We expect that the benefits of this pricing would eventually flow through to consumers.

6.68 The appropriate level of LLU charge control was last set in May 2009, and expires in March 2011. At this stage we are consulting only on the principle of having an LLU charge control. We are not proposing to review the form, level, or duration of the control at this stage. Rather, we plan to propose the appropriate form, level and duration for the charge control as part of a separate consultation before the current

[68] We propose to consider the specifics of the charge control, including the relevant costs, in a separate consultation.

control expires. Nevertheless, we consider that in principle a charge control on LLU would meet the criteria set out in section 47(2) of the Act, since it is objectively justifiable, non-discriminatory, proportionate and transparent. This is for the reasons below. However, we will consult on this again when we consult on our specific charge control proposals later in the year. At this time, we consider that a charge control is, in principle:

- objectively justifiable, as BT has SMP in the market, it is unlikely to be incentivised to reduce its costs and set prices at the competitive level;
- not unduly discriminatory, as BT is the only operator to have SMP in the market;
- proportionate, as we will ensure that it will allow BT to make a return on investment whilst acting to constrain BT's ability to set prices above the competitive level which may result in consumers paying higher retail prices; and
- transparent, in that the condition, when we formulate our detailed proposals, will be clear in its intention.

6.69 For the reasons set out above, we consider that the imposition of a charge control would in particular further the interests of citizens and further the interests of consumers in relevant markets by the promotion of competition in line with section 3 of the Act. Further, we consider that, in line with section 4 of the Act, the proposed condition in particular promotes competition in relation to the provision of electronic communications networks and encourages the provision of Network Access for the purpose of securing efficiency and sustainable competition in downstream markets for electronic communications networks and services, resulting in the maximum benefit for retail consumers.

6.70 As we have explained above, we are proposing pricing flexibility with respect to BT's VULA service and a general basis of charges obligation for LLU, SLU and PIA. PIA is still to be developed so we are not yet in a position to have any charge control and the level of demand for SLU has not yet materialised to make it appropriate to consider whether a charge control should be applied.

Minor modification to the existing charge control obligation

6.71 The existing LLU charge control operates in tandem with the general basis of charges obligation, that is, the obligation for costs to be based on LRIC+ continues to apply to the services charges subject to the LLU charge control, with the exception of the MPF Rental Charge, which is specifically exempted from the basis of charges obligation.

6.72 As we are intending to revoke the 2004 obligations as relevant and replace them with our proposed new obligations, subject to the outcome of this consultation, we have included a minor modification in our legal instrument to update the cross reference in the existing LLU charge control Condition FA3(A). This substitutes the reference to the existing basis of charges obligation (FA3) with the proposed new basis of charges obligation (FAA4).

Transparency measures

6.73 Ofcom can impose a number of other complementary general remedies that assist in securing transparency that the network access, undue discrimination and basis of charges remedies are working as effectively as possible For example, section

87(6)(b) of the Act gives Ofcom the power to require a dominant provider to publish a range of information relevant to the products for which network access is provided. These include, the terms and conditions on which it is willing to enter into an access contract (also known as a Reference Offer, or 'RO') in such manner as we may direct the specified terms and conditions into the RO. Finally, section 87(6)(e) permits the setting of SMP services conditions requiring the dominant provider to make such modifications to the RO as may be directed from time to time.

6.74 We consider below the following transparency requirements:

- requirement to publish a reference offer;
- requirement to notify charges and terms and conditions;
- requirement to notify technical information; and
- transparency as to quality of service.

Requirement to publish a Reference Offer

6.75 We are proposing that both BT and KCOM should be required to continue to produce ROs for products in this market. Our proposals for BT are more detailed as they include some additional minimum requirements that apply to specific access products, such as LLU and PIA. These remedies are discussed in Sections 7 to 9 .

Aim and effect of regulation

6.76 A requirement to publish an RO has two main purposes, namely, to assist transparency for the monitoring of potential anti-competitive behaviour and to give visibility to the terms and conditions on which other providers will purchase wholesale services. This helps to ensure stability in markets and, without it incentives to invest might be undermined and market entry less likely.

6.77 The publication of a RO would potentially allow for speedier negotiations, avoid possible disputes and give confidence to those purchasing wholesale services that they are being provided on non-discriminatory terms. Without this, market entry might be deterred to the detriment of the long-term development of competition and hence consumers.

6.78 The proposed condition requires the publication of a RO and specifies the information to be included in that RO (set out below) and how the RO should be published. It prohibits the dominant provider from departing from the charges, terms and conditions in the RO and requires it to comply with any directions Ofcom may make from time to time under the condition. The condition only applies where the dominant provider provides network access and/or duct access.

6.79 The proposed condition also requires the dominant provider to publish information on the use of network components in providing WLA services.

6.80 The published RO must set out (at a minimum) such matters as:

- a clear description of the services on offer;
- terms and conditions including charges and ordering, provisioning, billing and dispute resolution procedures;

- information relating to technical interfaces and points of interconnection;
- conditions relating to maintenance and quality (service level agreements ("SLAs") and service level guarantees ("SLGs"));
- the amount applied to network components;
- the location of local serving exchanges/MDF sites;
- the availability of co-location;
- conditions for site access; and
- safety standards.

6.81 Ofcom proposes that the condition applies to the WLA markets in which BT and KCOM have been found to have SMP.

Legal tests

6.82 We consider that the condition (Conditions FAA5 and FBB5 for BT and KCOM respectively, at Annex 6) meets the tests set out in the Act.

6.83 The condition is aimed at promoting competition and securing efficient and sustainable competition for the maximum benefits of consumers. It is intended to do this by ensuring that providers have the necessary information to allow them to make informed decisions about purchasing WLA services in order to compete in downstream markets. We consider that this is compatible with our duties in sections 3 and 4 of the Act.

6.84 Section 47 requires conditions to be objectively justifiable, non-discriminatory, proportionate and transparent. The proposed condition is:

- objectively justifiable in that it requires that terms and conditions are published in order to encourage competition and provide stability in markets;
- proportionate, as only information that is considered necessary to allow providers to make informed decisions about competing in downstream markets is required to be provided;
- not unduly discriminatory as it is applied to both BT and KCOM and no other provider has SMP in these markets; and
- transparent in that it is clear in its intention to ensure that BT and KCOM publish details of their WLA offerings.

Requirement to notify charges and terms and conditions

6.85 We are proposing to re-impose the obligation that sets out an existing notification requirement on BT and KCOM.

Aim and effect of regulation

6.86 Notification of changes to services at the wholesale level can further assist competition by giving advanced warning of charge changes to providers purchasing

wholesale services in order to compete with the dominant provider in downstream markets.

6.87 We believe that prior notification of changes to charges or other relevant terms and conditions is important to ensure that competing providers have sufficient time to plan for such changes, as they may want to restructure the prices of their downstream offerings in response to charge changes at the wholesale level.

6.88 Currently the notification period for changes to existing products and services is 90 days. This allows sufficient time for downstream providers to make necessary changes to their wholesale or retail products and services. We believe that 90 days remains an appropriate notification period for existing products and services. The prior notification period for new products and services is 28 days, reflecting the lesser administrative impact of changes to charges for new products and services. We consider that 28 days remains an appropriate notification period for new products and services.

6.89 Notification of changes to charges therefore helps to ensure stability in markets and without it, incentives to invest might be undermined and market entry made less likely.

6.90 However, there may be some disadvantages to notifications, particularly in markets where there is some competition. It can lead to a 'chilling' effect where OCPs follow BT's or KCOM's prices rather than act dynamically to set competitive prices. On balance, however, we do not consider that this consideration undermines the imposition of this obligation. In the WLA markets, where SMP remains persistent, there is a high level of reliance by competitors on the provision of wholesale services to enable them to compete in downstream markets. The advantages of notifying charges are therefore likely to outweigh any potential disadvantages.

Legal tests

6.91 The proposed condition (Conditions FAA6 and FBB6 for BT and KCOM respectively, at Annex 6) meets the tests set out in the Act.

6.92 First, our duties under section 3 and all the Community requirements set out in section 4 of the Act. In particular, we consider that the condition is aimed at promoting competition and securing efficient and sustainable competition for the maximum benefits of consumers by ensuring that OCPs have the necessary information sufficiently in advance to allow them to make informed decisions about competing in downstream markets.

6.93 Section 47 requires conditions to be objectively justifiable, non-discriminatory, proportionate and transparent. The proposed condition is:

- objectively justifiable, in that there are clear benefits from the notification of changes in terms of ensuring that providers are able to make informed decisions within an appropriate time frame about competing in downstream markets;
- proportionate, as 90 days is considered the minimum period necessary to allow competing providers to plan for changes to existing network access and 28 days for new network access;
- not unduly discriminatory as it is proposed for both BT and KCOM and there are no other providers with SMP in these markets; and

- transparent in that it is clear in its intention to ensure that BT and KCOM provide notification of changes to their charges and terms and conditions.

Requirement to notify technical information

6.94 We are also proposing that changes to technical information should be published in advance, so that competing providers have sufficient time to prepare for them. This obligation currently applies to BT and KCOM.

Aim and effect of regulation

6.95 Under the proposed requirement to publish a RO, BT and KCOM are required to publish technical information. However, advance notification of changes to technical information is important to ensure that providers who compete in downstream markets are able to make effective use of the wholesale services provided by BT and KCOM.

6.96 For example, a competing provider may have to introduce new equipment or modify existing equipment to support a new or changed technical interface. Similarly, a competing provider may need to make changes to their network in order to support changes in the points of network access or configuration.

6.97 Technical information includes new or amended technical characteristics, including information on network configuration, locations of the points of network access and technical standards (including any usage restrictions and other security issues). Relevant information about network configuration includes information about the function and connectivity of points of access, for example, the connectivity of exchanges to end users and other exchanges. Technical information also includes the information provided currently in the Network Information Publication Principles (NIPP) and Access Network Facilities (ANF) agreement and also includes any other additional information necessary to make use of services provided in the WLA market.

6.98 The condition requires the notification of new technical information within a reasonable time period but not less than 90 days in advance of providing new wholesale services or amending existing technical terms and conditions. Ofcom considers that 90 days is the minimum time that competing providers need to modify their network to support a new or changed technical interface or support a new point of access or network configuration.

6.99 Longer periods of notification may also be appropriate in certain circumstances. For example, if BT or KCOM were to make a major change to their technical terms and conditions, a period of more than the 90 day minimum notification period may be necessary.

6.100 Ofcom proposes that the condition applies in the WLA markets in which BT and KCOM have been found to have SMP.

Legal tests

6.101 We consider that the legal tests under the Act are satisfied as the proposed obligation to notify technical charges in advance (Conditions FAA7 and FBB7 for BT and KCOM respectively, at Annex 6) meets the tests set out in the Act.

6.102 We have considered our duties under section 3 and all the Community requirements set out in section 4 of the Act. In particular, the condition is aimed at promoting competition and encouraging service interoperability for the purpose of securing efficient and sustainable competition and the maximum benefits for consumers by ensuring that providers have sufficient notification of technical changes to the local access network to enable them to compete in downstream markets.

6.103 The proposed condition satisfies the requirements of section 47 because it is:

- objectively justifiable in that it enables providers to make full and effective use of network access to be able to compete in downstream markets;
- not unduly discriminatory as it is proposed for both BT and KCOM and no other operator has SMP in these markets;
- proportionate in that 90 days is the minimum period that Ofcom considers is necessary to allow competing providers to modify their networks; and
- transparent in that it is clear in its intention that BT and KCOM notify technical information and the timeframe for such notification.

Transparency as to quality of service

6.104 A QoS remedy is currently applies to BT and we are proposing to continue to require this remedy so that it operates alongside the general network access remedy. At the time of the last review we decided against imposing specific Key Performance Indicators ("KPIs") as they were still largely undeveloped. Now these have been developed by BT in conjunction with the OTA and industry input we are proposing to issue a draft direction to formalise the existing specific LLU service KPIs to provide a level of certainty for industry that minimum KPI reporting would continue for LLU. We are not proposing this obligation to apply to KCOM as it does not currently provide products on a scale to make this reporting statistically meaningful, so it would not address the aim of this proposed regulation.

Aim and effect of regulation

6.105 In relation to the requirement not to unduly discriminate, there is the potential for a vertically integrated provider such as BT to provide a QoS to competing providers that is not equivalent to that provided to itself. This may disadvantage competing providers and give the provider with SMP an unfair advantage.

6.106 It may be possible to address this concern by requiring a dominant provider to provide wholesale services to competing providers using the same operational systems processes and interfaces that it uses to supply equivalent services to itself. However, the high cost of replacing legacy systems means that this will not always be practical, or indeed proportionate.

6.107 Instead, Ofcom considers that BT should publish data relating to the quality of service it delivers to itself and to other providers. By providing transparency, BT's competitors should be able to identify where potential discrimination exists. Ofcom considers that this would best be achieved through publication of a set of KPIs, covering those processes which are essential for the development of LLU, particularly provisioning and fault repair.

6.108 The overall objective of KPI reporting is not to set an absolute standard for BT's performance, of the type that would normally be contracted in a SLA. The KPIs are not intended to be contractually binding commitments, nor should they be linked to compensation payments. The intention is that they would give an indication of BT's overall performance and ensure that the relative performance BT provides to its competitors is equivalent to the service offering it provides to itself. Ofcom recognises there may be practical difficulties in identifying an appropriate comparator, either because BT does not currently measure its own performance or because there may not be direct comparators available (although there may be similar processes involved).

6.109 We therefore propose that the existing general QoS condition should continue to apply to BT. Below we set out a minimum list of KPIs that we think BT should report on in order to ensure that the provisions of this condition are met:

- Average order provisioning time;
- Percentage of orders provisioned right first time; and
- Percentage of faults repaired on time.

6.110 The draft direction formalises as a minimum obligation the existing KPI reports that BT already provides through the OTA and its Openreach online reporting tool. Over time the format may change and other metrics may become substantially more import. We expect that BT would continue to work cooperatively with the OTA and industry to further improve the reporting metrics and introduce additional reporting metrics as agreed and appropriate. However, the draft direction is designed to give OCPs a minimum level of certainty and does not impose any further burden on BT. As new products are developed and used, we would consider whether further KPI measures are necessary.

Legal tests

6.111 Condition FAA8 is set out in Annex 6. The draft direction on specific LLU KPIs can be found in Annex 7. We consider that both proposed obligations meet the tests set out in the Act.

6.112 We consider that we have acted consistently with our duties under section 3 and all the Community requirements set out in section 4 of the Act. In particular, the condition is aimed at promoting competition and securing efficient and sustainable competition for the maximum benefit of consumers by ensuring that BT provides an equivalent quality of service to providers competing with it in downstream markets, as it provides to itself.

6.113 The proposed condition and direction satisfy the elements of section 47 and section 49(2) as the obligations are:

- objectively justifiable because the requirement is intended to ensure that there is no undue discrimination in the quality of service provided;
- not unduly discriminatory because KCOM does not supply substantial wholesale volumes of services and a reporting obligation would not be statistically meaningful, whereas it would be with respect to the volumes supplied by BT to OCPs;

- proportionate because we believe this to be the minimum set of KPIs needed to ensure that the provisions of the condition are met; and

- transparent in that it is clear in its intention to require BT to publish data on quality of service.

6.114 Although an equivalent condition is not proposed for KCOM, it does not unduly discriminate as it is only appropriate to impose such a condition where there is sufficient demand for a wholesale service such that the data provided would be statistically meaningful. This is currently not the case in respect of KCOM.

Requirements for cost accounting and accounting separation

6.115 We propose to continue to impose on BT obligations to have cost accounting systems and accounting separation in relation to the WLA market. We think it is appropriate for the same obligations to continue to apply to BT, but as we explain in more detail below, we plan to make a technical modification so that the same cost accounting and reporting SMP obligations that were first notified in July 2004 applying to all other regulated wholesale and retail markets would also cover BT's services in this market and instead the specific obligations would not be re-imposed. We are not proposing that these obligations should apply to KCOM.

Aim and effect of regulation

6.116 The imposition of regulatory financial reporting obligations on dominant providers is an important means of ensuring that obligations in relation to cost orientation and non-discrimination (as have been proposed in relation to BT above) can be effectively monitored for a given market. In particular, it is important that cost accounting information is provided to measure compliance with cost orientation requirements and accounting separation is maintained to provide transparency in accordance with no undue discrimination conditions.

6.117 The appropriateness of imposing a regulatory financial reporting obligation and the level of information required is a question to be decided on the basis of the findings of an individual market review.

6.118 Given the preliminary findings of this review, we believe it remains appropriate to continue to impose the existing financial reporting obligations on BT in respect of the products and services they provide in the WLA market.

6.119 As new products and services are supplied we propose that the current financial reporting obligations on BT will need to be amended to encompass those new products and services.

6.120 With respect to KCOM however, we consider that this complementary obligation would be disproportionate as a way to demonstrate that it is meeting its obligations of cost orientation and to not unduly discriminate, as there is no demand for network access in Hull. We would reconsider this position should KCOM commence providing network access, at which point these obligations could become important to demonstrate compliance with the proposed cost orientation and no undue discrimination obligations.

6.121 As discussed earlier in this section, we propose to maintain the general remedy on BT for the basis of charges, i.e., cost orientation obligations, and consider that the most appropriate basis for setting charges is LRIC+.

6.122 It is essential, if the obligation for cost orientation is to be meaningful, that there is a clear and comprehensive understanding of the costs of BT and how these are attributed to different parts of its activities. In order to accomplish this, a regulatory financial reporting system must capture all relevant financial, operational and other information necessary to prepare and present financial information. Cost accounting reporting therefore enables us to determine whether charges are cost-oriented.

6.123 Sections 87(9) to 87(11) of the Act allow Ofcom to impose appropriate cost accounting obligations on dominant providers in respect of the provision of network access, the use of the relevant network and the availability of relevant facilities. Cost accounting rules may be made in relation to charge controls, the recovery of costs and cost orientation. We therefore consider that we have the necessary legal basis to impose cost accounting obligations on BT in the WLA market in the UK excluding the Hull Area.

6.124 It is also essential, if the obligation to not unduly discriminate is to be meaningful, that BT can be required to make transparent its wholesale prices and internal transfer prices, i.e., to demonstrate that they are not unduly discriminating against OCPs. In practice this means that they are obliged to produce financial statements that reflect the performance of markets as though they were separate businesses. Accounting separation therefore enables Ofcom to monitor whether BT is unduly discriminating.

6.125 Under section 87(7) and 87(8) of the Act, appropriate accounting separation obligations may be imposed on the dominant provider in respect of the provision of network access, the use of the relevant network and the availability of relevant facilities. That is to say, the dominant provider may be required to maintain a separation for accounting purposes between such different matters relating to network access or the availability of relevant facilities. We consider therefore that we have an appropriate legal basis to continue to impose accounting separation obligations on BT.

6.126 The practical processes of cost accounting and accounting separation, on the other hand, such as cost attribution methodologies, accounting standards, audit, transparency, disaggregation, reconciliation and publication of information, are distinct from the broader question of principle on the appropriate level of regulation in the market and the remedies to be applied. We believe that the practical processes for regulatory financial reporting should be consistent across all markets susceptible to regulation to ensure that there is certainty and transparency for the regulator, the dominant providers and their competitors.

Proposed consequential modifications

6.127 We are proposing to continue to impose on BT obligations to have cost accounting systems and accounting separation in relation to the WLA market. However, we are also taking this opportunity to propose removing the parallel reporting regime we put in place in the 2004 WLA market review and varying the July 2004 regulatory reporting notification.

6.128 On 22 July 2004[69] following two detailed consultations[70] we imposed various regulatory financial reporting obligations on BT and KCOM in a number of different

[69] Ofcom, *The regulatory financial reporting obligations on BT and Kingston Communications,* 2004 statement, http://www.ofcom.org.uk/consult/condocs/fin_reporting/fin_report_statement/
[70] http://www.ofcom.org.uk/consult/condocs/fin_reporting/

wholesale and retail markets where market reviews had recently been concluded. When the obligations were finally imposed in the July 2004 final statement they consisted of:

- SMP services conditions for regulatory financial reporting on BT (Conditions OA1 to OA34) and KCOM (Conditions OB1 to OB33) covering all forms of regulatory reporting; and
- directions under those conditions setting out:
  - the network components to be reported on (direction 1);
  - the transparency of the systems (direction 2);
  - the financial statements to be prepared and published and the appropriate audit levels (direction 3);
  - the form and content of these financial statements (direction 4);
  - the fairly presents in accordance with (FPIA) audit opinion (direction 5); and
  - the properly prepared in accordance with (PPIA) audit opinion (direction 6).

6.129 In the 2004 WLA market review we consulted separately on imposing the same SMP services obligations for regulatory financial reporting on BT. (Condition FA10 comprising sub-conditions FA10.1 to FA10.30) with the exception of the Conditions specifically applying to retail markets. Conditions FA10.1 to FA 10.28 are identical to Conditions OA1 to OA 28. Condition FA10.29 is identical to OA32 and FA10.30 is the same as OA33. We also implemented the same directions as set out in the July 2004 statement.

6.130 Over time we have made a number of changes to the general obligations through the publication of various directions and modifying directions. We have made a series of parallel directions to the FA10 framework where we have needed to maintain consistency.

6.131 The effect of this proposed modification would mean that all the generic reporting requirements are extended to the WLA market that we have identified in this market review. As explained in paragraph 6.129, the current FA10 conditions imposed on BT in December 2004 are identical to the other wholesale-specific reporting obligations that were imposed in July 2004 (OA1 to OA 28, OA 32 and OA 33) so this change is procedural rather than substantive. We believe this change is sensible as it would mean that in the future all regulatory financial reporting requirements for BT are contained in a single set of reporting obligations. To the extent that Directions were given under Condition FA10.2 we intend for them to be preserved as if they were made under the equivalent directions power in Condition OA2.

6.132 We are currently consulting on annual changes to the regulatory reporting requirements[71]. That consultation is proposing some changes to enhance the presentation and quality of BT's regulatory financial statements reflecting developments in the regulatory, technological and competitive environment, our ongoing analysis and use of the these statements, comments from users of the

[71] See Changes to BT and KCOM's regulatory and financial reporting 2009-10 update, http://www.ofcom.org.uk/consult/condocs/btregs10/condoc.pdf

statements and discussions with BT. We are also proposing changes to implement the outcomes of market reviews we recently concluded.

6.133 When we conclude market reviews, including any decisions we make about regulatory financial reporting obligations, our usual practice is to formalise any additional or changed regulatory reporting obligations as part of the annual regulatory reporting framework. Subject to the outcome of this consultation, we intend to do this for WLA and will work with BT on how it will adapt its reporting systems in the future to reflect any further reporting obligations arising from the imposition of the proposed new remedies such as VULA and duct access.

Legal tests

6.134 We have considered our duties under section 3 of the Act and believe that the continued application of the regulatory financial accounting conditions on BT would further the interests of citizens and furthers the interests of consumers in relevant markets by the promotion of competition.

6.135 We have considered the Community requirements set out in section 4 of the Act and believe that the modification to the proposed condition meets the requirements. Specifically, section 4(8), where the obligation has the purpose of securing efficient and sustainable competition in the markets for electronic communications networks and services, by ensuring dominant providers do not favour their own downstream businesses, thereby disadvantaging third party CPs.

6.136 Ofcom considers the proposed conditions meet the criteria set out in section 47(2) of the Act. The obligations are:

- objectively justifiable as it relates to the need to ensure competition develops fairly, to the benefit of consumers;
- not unduly discriminatory as BT is the only provider holding SMP in the relevant markets actually supplying a product third party CPs;
- proportionate as it is necessary as a mechanism to allow Ofcom and third parties to monitor for unduly discriminatory behaviour by BT and to ensure that the obligations for cost orientation are being met; and
- transparent as it is clear the intention is to monitor compliance with specific remedies and the particular accounting separation requirements of BT are clearly documented. The existing conditions and directions which Ofcom is proposing to re-apply to BT were consulted on extensively (both when first applied in 2004 and for any subsequent changes have been consulted on as part of the annual regulatory reporting consultations) and we consider that, in conjunction with the explanation set out in this section, our proposals have been made appropriately transparent.

Summary of proposals on general remedies

6.137 We propose that the following general remedies should apply to BT and KCOM as shown in Figure 6.2 below.

6.138 The notable proposed changes and clarifications to the existing set of general access obligations are summarised below:

- We are proposing a slightly modified obligation for the process for new network access, and proposing that this obligation should now extend to KCOM;
- The general no undue discrimination obligation should apply to BT and KCOM. However, in relation to BT's provision of VULA we are proposing a stricter requirement (see paragraphs 7.262-7.264). This position is set out as part of our proposal on VULA and the proposed specific access obligation for that product;
- For VULA, we are proposing that the basis of charges condition should not apply;
- We are proposing that the general RO obligation on BT should now include some specific requirements for the Physical Infrastructure Access product;
- We are proposing to give a Direction to BT under the quality of service obligation, to formalise the existing LLU KPI reporting arrangements; and
- We are proposing a procedural change to BT's financial reporting requirements that would mean that all of those requirements are contained in a single set of reporting obligations (see paragraphs 6.127-6.133).

Figure 6.2 Proposed general access remedies in the WLA market

Remedies proposed for BT	Remedies proposed for KCOM
• Requirement to provide network access on reasonable request; • Requests for new network access; • Requirement not to unduly discriminate; • Basis of charges (i.e., cost orientation); • Requirement to publish a reference offer; • Requirement to notify charges and terms and conditions; • Requirement to notify technical information; • Quality of service; and • Requirement for cost accounting and accounting separation.	• Requirement to provide network access on reasonable request; • Requirement not to unduly discriminate; • Basis of charges (i.e., cost orientation); • Requirement to publish a reference offer; • Requirement to notify charges and terms and conditions; and • Requirement to notify technical information.

6.139 Ofcom considers that the package of remedies proposed above is appropriate to address BT's and KCOM's SMP in the local access markets. The package of

remedies aims at promoting competition and securing efficient and sustainable competition for the maximum benefit of consumers. Specifically, the proposed remedies would ensure that BT provides network access on fair, reasonable and non-discriminatory terms, the charges for which must be cost oriented. In addition, the proposed remedies ensure that competing providers have necessary information, including technical information, which is provided sufficiently in advance to allow them to make informed decisions about competing in downstream markets.

6.140 Finally, the proposed remedies ensure that it is possible to monitor BT's quality of services and that BT is fair and reasonable in the way in which it deals with requests for new network access.

Consultation questions

Question 4 Do you agree with our proposals for the general access requirements that should apply to BT and KCOM respectively? If not, please explain why.

Question 5 Do you agree that Ofcom should impose a new network access obligation on KCOM, that would require it to follow a statement of requirements process to handle requests for new network access in this market? If not, please explain why.

Section 7

Analysis of specific access remedies

Introduction

7.1 Sections 7 to 9 cover our proposals concerning obligations on BT and KCOM to provide specific access products, over and above the general access remedies covered in Section 6. We consider specific access products in relation to both CGA and NGA networks.

7.2 This section analyses the following specific access product remedies that could be imposed on BT:

- Fibre access;
- Local Loop Unbundling;
- Sub-loop Unbundling;
- Physical Infrastructure Access (i.e., duct and pole access); and
- Virtual Unbundled Local Access (VULA).

7.3 We assess the role that these specific remedies could play in supporting our competition and investment objectives on a stand-alone basis. We also consider how some of these specific remedies could be designed in order to make them effective. A greater level of detail is provided for some of the possible remedies in order to explain sufficiently the potential form in which they might be implememented.

7.4 In Section 8, we then assess and propose what combination of remedies we consider to be appropriate. Also in Section 8, we cover our proposals in relation to specific remedies on KCOM, and a number of other issues relating to the imposition of specific access remedies.

7.5 Section 9 then sets out how each of the proposed SMP conditions (which relate to individual access remedies) meets the relevant legal tests.

Physical and non-physical access remedies

7.6 Access product remedies can be distinguished by the degree of electronic processing involved in operating them. A remedy that relies on the access to the physical network infrastructures such as copper, fibre and duct are sometimes called ‘passive’ remedies, on the basis that they do not include any active electronic equipment.

7.7 Conversely, a non-physical (sometimes called an ‘active’) remedy includes active electronic equipment that is connected to the physical infrastructure. CPs purchasing a non-physical access remedy would need to interconnect with equipment in the local serving exchange.

7.8 On the basis of this distinction, the current access product remedies in the WLA market - LLU and SLU - are physical remedies. CPs interconnect with the local

copper access connections to end users' premises either at BT's local MDF exchanges (for LLU) or cabinets (for SLU).

7.9 We consider that non-physical remedies can be imposed in the WLA market as long as they have the right characteristics, in that they provide being met by a virtual product that offers the same features as a physical product.

LLU obligation on BT

Introduction

7.10 The original legislation which required BT to offer LLU was introduced in 2000, and it has been followed by several other decisions detailing how, where, and at what price it is available. LLU is a remedy that requires BT to allow CPs to partly or wholly rent a customer's local 'copper' access connection, so that they can provide voice and/or data services directly to end users using their own equipment, which is deployed in BT's exchanges.

7.11 LLU provides CPs with greater control of their communication services, providing them with a significant ability to innovate and differentiate their products from BT. This enables CPs to potentially support a broader range of applications, products, and services than if they had less control over characteristics of those services. It is the additional control and flexibility provided by LLU that has increased benefits over resale products.

7.12 The LLU service sets the terms and conditions for interconnection at BT's exchanges with the local copper access network right through to the end user premises. LLU might be in the form of either full access[72] or shared access[73] which provides a CP the choice to provide all or some of the communications services to end users. Both full and shared LLU access are illustrated in Figure 7.1.

7.13 In addition to the core access products, a number of ancillary services are necessary to enable and support the provision of LLU. For example; internal tie cables, external tie cables, site access, co-location, co-mingling and power.

7.14 There is currently a charge control in place to regulate the price of full and shared access. This charge control will run until 31 March 2011[74].

Aim of LLU

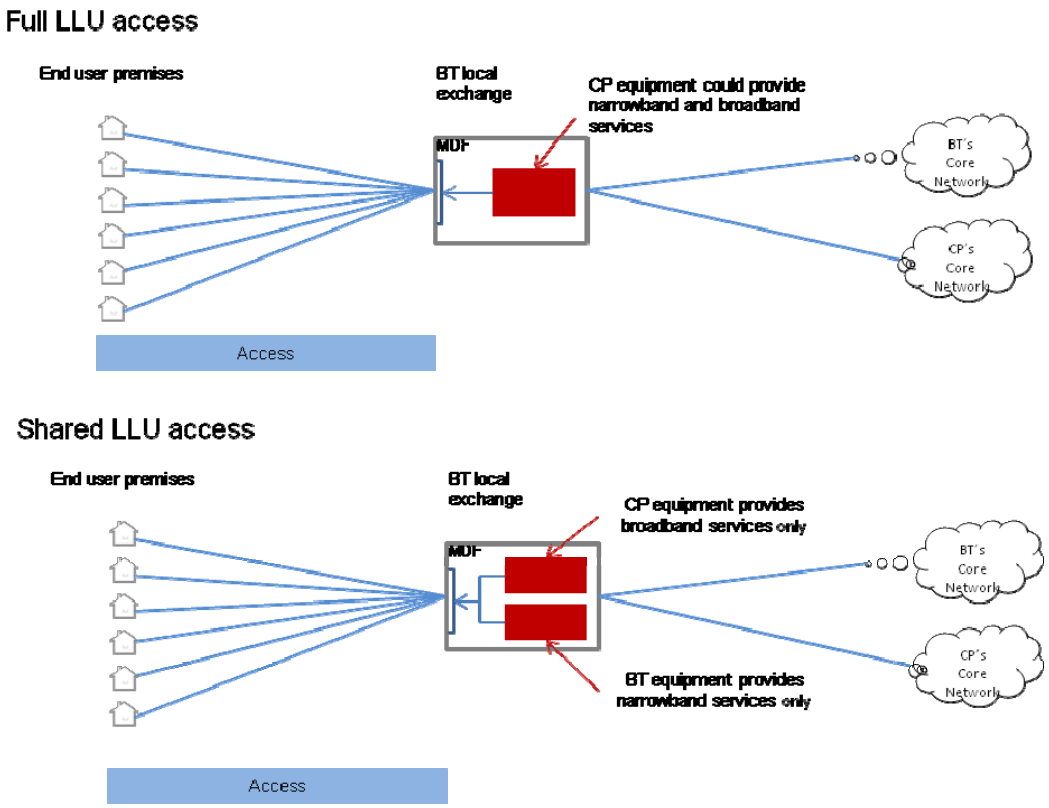
7.15 LLU enables CPs to provide products so that they can compete with each other and BT, at the deepest level where competition is it likely to be effective and sustainable for CGA-based services.

7.16 There are significant entry barriers to building a local access network arising from the high capital cost of establishing the network. Virgin Media has the second largest local access network in the UK. However, its coverage is limited to approximately 46 per cent of UK premises. The purpose of the LLU remedy is to allow OCPs to use

[72] The CP is able to provide the narrowband voice service in addition to broadband data services on a single copper line.
[73] BT provides narrowband voice services, and the CP provides broadband data services on a single copper line.
[74] The current LLU charge control was set in May 2009 as part of the Openreach Financial Framework - http://www.ofcom.org.uk/consult/condocs/openreachframework/statement/annexes.pdf

BT's access network to compete effectively with BT for the provision of services to end users without having to replicate the entire local access network. The incentives for CPs to take up LLU services arise from the flexibility that LLU provides, which enables them to innovate and differentiate their services from BT and OCPs, as well as the fact that charges are cost-based. The benefits of innovation provided to CPs flow through to consumers in the form of greater choice, better pricing, new products or improvements to existing products.

Figure 7.1 Full and Shared LLU access



Impact of LLU

7.17 LLU has resulted in positive outcomes for industry and consumers alike. Industry has seen increased take-up of wholesale access products, with CPs deploying their own networks in competition with BT, and changes in the competitive landscape in fixed telecoms. Consumers increasingly have adopted fixed broadband services, benefited from greater choice and more affordable baskets of fixed telecommunications services, and as a result have derived greater satisfaction from those services.

7.18 LLU has now been rolled out to nearly 84 per cent of UK premises (excluding Hull) in the form of both shared and full access. The take-up of these services has grown from less than 200,000 lines in Q3 2005 to approximately 6.4 million in February 2010[75]. In these areas, there are now at least two CPs (including BT) who are able to provide LLU-based products and are in direct competition. Through the Undertakings, BT is committed to provide these access products on an EOI basis. CPs have taken advantages of the opportunities offered by LLU and have invested in

[75] http://www.offta.org.uk/charts.htm

LLU products. This has allowed CPs to roll out products in downstream markets, where they are able to provide all the service components to supply services to end users, without reliance on BT to provide all the access products.

7.19 We have met with several CPs to discuss their plans for further LLU roll-out. They have indicated there is more planned over the next 18 months, although the rate at which CPs will expand their LLU footprint is expected to slow. There may continue to be increases in the coverage of LLU in the UK past this period, however based on the information currently available to us, such increases are likely to be limited[76].

7.20 We are now seeing a movement from shared access to full access as CPs look to provide an increased range of bundled voice, broadband and even triple-play services over their own infrastructure. As this shift occurs, the requirements of CPs are likely to change, and our regulatory approach must be flexible enough to evolve with such changes.

7.21 Some OCPs have expressed concerns that BT's migration to NGA could have a negative impact on its performance a supplier of LLU products. We remain committed to ensuring that there will be effective equivalence and transparency in how these products are supplied. Our approach has been to rely on monitoring and publication of appropriate performance indicators to measure BT's performance in providing LLU products. Under this arrangement, the OTA monitors BT's performance in providing LLU products. We propose to continue these requirements, and to adapt the precise measures as necessary. Our proposals on this are set out in paragraphs 6.104-6.114.

7.22 There has also been significant change in the distribution of market shares in downstream markets. BT's market share for fixed voice call volumes fell to 47 per cent in 2008[77]. Similarly, its share of the WBA market fell from 71 per cent at the end of 2005 to 47 per cent at the end of 2008, on a national basis.

7.23 In terms of the impact on consumers, there has been a significant increase in fixed broadband penetration in the UK, which stood at 65 per cent of UK premises by March 2009[78]. Along with the increase in fixed broadband penetration, services have also become more affordable for consumers[79]. Consumers have also seen improved retail offers by CPs with increased headline speeds for broadband access as CPs compete to provide faster products.

7.24 Similarly, there have been increased levels of switching in broadband by consumers, with the rate increasing from 21 per cent in Q2 2006 to 32 per cent in Q2 2009[80]. We have observed that there have been migration issues for consumers, particularly for broadband, and we remain committed to encouraging further improvements in this process in conjunction with the OTA.

Assessment of options

7.25 We have set out two options for LLU:

[76] See the WBA consultation document
[77] http://www.ofcom.org.uk/telecoms/btundertakings/impact_srt/impact_srt_fulldoc.pdf
[78] Ofcom communications market report Q3, 2009
[79] http://www.ofcom.org.uk/telecoms/btundertakings/impact_srt/impact_srt_fulldoc.pdf
[80] Ofcom's Consumer Experience report, 2009
http://www.ofcom.org.uk/research/tce/ce09/research09.pdf

- Option 1: keep the existing LLU remedy in its existing form; and
- Option 2: remove the specific LLU remedy.

7.26 When considering which option is most appropriate, we have had regard to the likely costs and benefits for each option.

Option 1: Keep the existing LLU remedy

7.27 There are now more than six million unbundled copper access connections in the UK. Since this remedy was introduced, there has been sustained and significant uptake of broadband services in downstream markets, to the benefit of end users. Although the speed of LLU rollout to BT exchanges is slowing, the level of take-up of LLU services is likely to remain high. We do not have any evidence that the demand for LLU-based services will drop below existing levels in the short term.

7.28 The existing set of LLU services has been developed and refined by BT and industry over a number of years as a result of significant time, effort and investment. We also set the level of an LLU charge control. The LLU remedy and the level of the charge control have encouraged CPs to invest in their own equipment inside BT exchanges to provide services in downstream markets, and has resulted in intensified competition in providing services to end users.

7.29 The impact on BT of retaining the existing remedy would be likely to be very limited. Supplying LLU does require ongoing resource from BT, but we do not consider this to have a great impact on BT. As noted previously, the existing LLU remedy has been developed following extensive industry discussions with BT, is well developed, and is currently not the subject of significant contention.

7.30 A requirement on BT to provide LLU would require BT to continue to develop and maintain products and processes that it is otherwise unlikely to do. It would also require BT to enter into contractual relationships with OCPs. These requirements could, therefore, have the affect of diverting BT's resources away from its planned and prefer commercial activities. However, BT would be financially compensated when it provides LLU, due to the proposed pricing approach. Thus, once the demands for LLU are understood BT would be able to properly resource it, such that it does not adversely affect its other commercial activities.

7.31 For OCPs, a requirement on BT to provide LLU would reduce the entry barriers for those OCPs wishing to provide telecommunication services to consumers. This would, therefore, allow them to enter new markets and expand their businesses. OCPs benefit from the processes and systems in place for maintaining and enhancing LLU products. Continuing the existing LLU requirement provides a constraint on BT's ability to degrade the LLU products, and makes it more likely that they would maintain or improve the existing product standards. Therefore, the impact on OCPs of keeping the existing LLU requirement would be beneficial, providing certainty in respect of their existing and future investment in LLU products.

7.32 A requirement on BT to provide LLU would promote competition in the supply of fixed telecommunications services. This would benefit consumers in terms of increased choice of provider and a wider range of products with improved quality of service and better value for money.

Option 2: Remove LLU requirement

7.33 This option would remove the requirement on BT to provide LLU as part of a specific remedy. CPs would be required to rely on the general access obligation to set the terms and conditions for LLU services. CPs could request LLU access provided that request was technically and economically feasible for BT.

7.34 There is still considerable demand for LLU from CPs already using those services. If CPs wanted to continue to use LLU services they might have to commercially negotiate new terms, including pricing. BT could benefit as a result of revised terms and conditions for LLU, and CPs could face less favourable terms and conditions.

7.35 The impact on CPs of removing the existing LLU remedy potentially could be very significant. BT could withdraw the LLU products, or increase charges above costs, which could have a significant impact on the level of competition in downstream markets. CPs' planned LLU investments could potentially be withdrawn, and existing investments could be unwound. If CPs were to unwind investments, there could be a significant impact on the competitive constraints faced by BT in the future.

7.36 The removal of the LLU remedy would allow BT to divert its internal resources to other products and services. In addition, it could lower the level of competition faced by BT if removal of the LLU remedy resulted in CPs being less able or inclined to compete in any form.

Charge control on LLU

7.37 We consider that the existing LLU charge control provides certainty to CPs and acts as a constraint in the downstream WBA market. If LLU continues, we propose that it remains appropriate to have an LLU charge control, to address competition concerns. This is because in the absence of that charge control BT would have an incentive and the ability to raise the prices above the competitive level.

7.38 The appropriate level of LLU charge control was last set in May 2009, and expires in March 2011. At this stage we are consulting only on the principle of having an LLU charge control. We are not proposing to review the form, level, or duration of the control at this stage. Rather, we plan to propose the appropriate form, level and duration for the charge control as part of a separate consultation before the current control expires.

Fibre access

Description

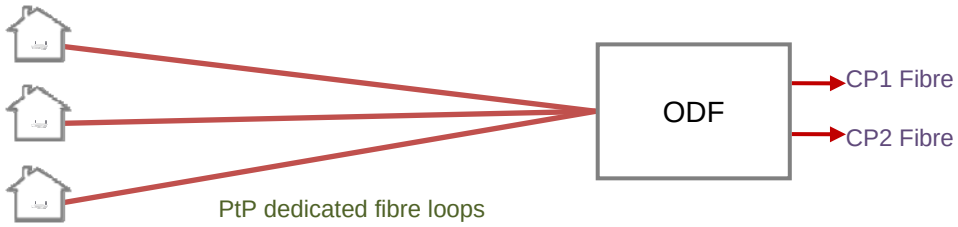
Physical fibre unbundling

7.39 Fibre unbundling is possible where FTTP has been deployed. A FTTP deployment is a fully optical solution where fibre cables replace the entire copper loop[81]. Currently, two basic FTTP architectures exist: point-to-point ("PtP") and point-to-multipoint. The latter is often referred to as a passive optical network ("PON") or a giga-bit passive optical network ("GPON"). The options for fibre unbundling will be different for each of these architectures and these are discussed below.

[81] The MDF is replaced by the ODF (which can use the same MDF site locations).

7.40 With a PtP architecture (see Figure 7.2) a dedicated fibre connection is available to each end user from the exchange building. Compared with point to multipoint, an advantage of this architecture is that the entire fibre capacity is available to each end user. However, it does use more fibre and would require more equipment (in the local serving exchange) to operate the fibre.

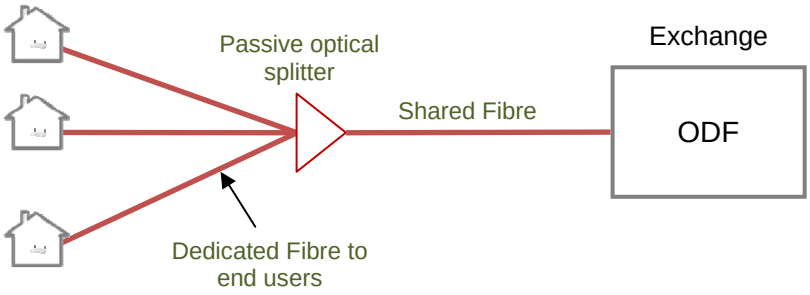
Figure 7.2: PtP FTTP architecture



7.41 Physical unbundling of fibre under a PtP architecture would be similar to full LLU access, with the copper being replaced with fibre. Like LLU, if there are a sufficient number of end users being served from the exchange (ODF) then fibre unbundling could be an attractive option.

7.42 Point-to-Multipoint architectures are based on a shared infrastructure topology, such as a PON. In a PON deployment, a single fibre from the exchange is shared by several end users by means of a passive optical splitter which is deployed somewhere between the exchange and the end users premises, see Figure 7.3.

Figure 7.3 Point to Multi-point FTTP architecture



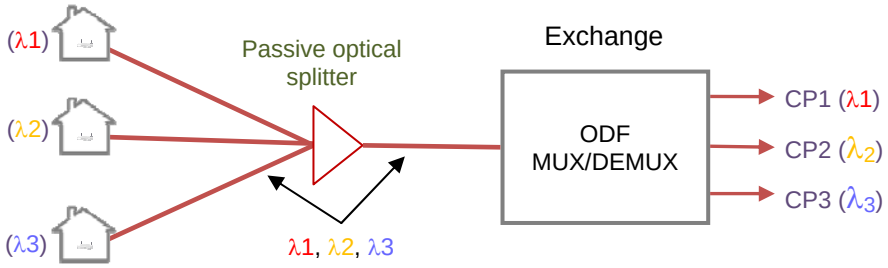
7.43 Physical unbundling of fibre under a PON architecture is only possible at the passive optical splitter. With this arrangement competing CPs would need to have their own fibre connections between the exchange and the passive splitter, then when end users switch between different CPs the dedicated fibres to end users would need to be disconnected from one CP's network and connected to the other CP's network at the passive optical splitter. Within BT's network, it is likely that the passive optical splitter would be positioned somewhere between the street cabinet and the end user premises (e.g., at a distribution point).

7.44 Given that there is likely to be a high number of passive splitter locations and that the process for disconnecting/reconnecting end user fibres will require significant manual intervention, this type of fibre unbundling is likely to be costly and impractical[82].

Wavelength unbundling (on a PON)

7.45 In the situation where only a single PON exists a possible alternative to physical fibre unbundling at the passive optical splitter is to unbundle individual wavelengths (lambdas (λ)) on the PON. With this arrangement competing CPs are each allocated a different wavelength on the PON. The PON is therefore used to support multiple wavelengths simultaneously. Each competing CP therefore has its own virtual PON which are separated by different wavelengths, as opposed to their own physical PON which would be separated by different fibres (see Figure 7.4).

Figure 7.4: Wavelength unbundling (on a PON)



7.46 While wavelength unbundling would seem to promote efficient use of a PON it needs to be recognised that it does require additional equipment to combine and manage multiple wavelengths. Further, the standards for such equipment are still at a very early stage of development and it is likely to be several years before they mature. However, retro-fitting wavelength unbundling is likely to be possible, if and when standards do develop and mature.

7.47 Due to the current immaturity of the standards and associated products for wavelength unbundling we do not consider that it would be appropriate to have such an obligation at the current time. However, we will continue to monitor developments and reconsider, as necessary, in the future.

Multiple fibres

7.48 Given the issues associated with unbundling a PON, either fibre or wavelength, there has been some interest in the prospects of multiple fibres. In this context if multiple fibres had been deployed in all parts of the network, but in particular to the end user, then rather than trying to unbundle a single PON it would be possible to create multiple parallel PON networks. In this way each competing CP would have its own physical PON which would be separated by different fibres.

7.49 This would clearly remove the need to either unbundle fibre at the passive splitter or unbundle wavelengths, as instead the end user would simply be connected to a different fibre within its premise.

[82] *Analysys Mason, Competitive models in GPON,* December 2009

7.50 However, the likelihood that this situation would occur under normal commercial conditions is questionable. This is because if a CP was to deploy a FTTP network, whilst it might deploy one or two 'spare' fibres to allow for expansion and/or fibre breakages, it is unlikely to deploy multiple 'spare', as from its point of view this would be unnecessary.

Current and future availability of FTTP within BT's access network

7.51 With the exception of a few relatively small new development areas, at the current time there has been no deployment of FTTP within BT's access network. However, this is expected to change over the next few years, as BT currently plans to deploy FTTP across about 10 per cent of its network, about 2.5m premises, by the end of 2012, BT's FTTP deployment is expected to be a point to multipoint (GPON) architecture.

7.52 Clearly, in areas where BT has not deployed FTTP there will not be any suitable fibre in the access network. Therefore, there will be no scope for fibre access of any kind.

Options for Fibre access

7.53 We consider three options for accessing fibre. We give a description of each below, and then go on to explain the costs and benefits. The options are as follows:

- Option 1 - Rely solely on the general access obligations;
- Option 2 – introduce a specific condition requiring BT to unbundle its GPON end user fibres at the passive optical splitter; and
- Option 3 – introduce a specific condition requiring BT to deploy multiple fibres where it deploys its FTTP network.

Option 1- Rely solely on the general access obligations

7.54 With this option if a CP wanted fibre access they would need to make a reasonable request such access under the general access obligations.

7.55 This option is likely to be appropriate if it is considered there is unlikely to be significant demand or interest for fibre access in the period covered by this review. This is because if there is not likely to be any significant demand or interest for fibre access then it would be disproportionate to require BT to develop and maintain a fibre access product and RO.

Option 2 – introduce a specific condition requiring BT to unbundle its GPON end user fibres at the passive optical splitter

7.56 In addition to the general access obligations this option would set out a specific requirement on BT to unbundle its GPON at the passive optical splitter. It would, therefore, provide certainty to the market that the regulator considers this form of Network Access to be appropriate.

7.57 The main advantage of this type of access is that it avoids duplication of BTs network in the end user access segment. This would, therefore, lower the barriers to market entry.

7.58 However, there has been very little interest in GPON unbundling, and this is likely to be mainly due to the impracticality and considerable costs associated with gaining access to a GPON network at the passive optical splitter. BT is likely to place its passive optical splitter between the cabinet and the end user premise, when deploying its GPON. There are around 4.3 million distribution points, and around 90,000 cabinets. This means a CP would have to incur large costs in deploying passive equipment, to connect customers at a large number of disparate locations. In addition, given the labour intensive process, network faults are likely to occur when unbundling and switching customers, leading to high maintenance costs and poor customer service. Again, the extent of this is likely to be significant given the large number of access points.

7.59 While this option would allow a CP to avoid replicating costs in fibre expenditure and civil construction between splitter and premise (as noted above), a CP would still need to incur large fibre deployment and civil construction costs to complete its network from the splitter.

7.60 Evidence[83] from *Analysys Mason, Competitive models in GPON* (December 2009) supports this. It estimates that at the DP, there could be an incremental cost increase of 53 per cent (from £34 per line per month) for a second operator to unbundle a GPON; and up to £72 per line per month for four competing networks. At the cabinet, there could be an incremental cost increase of 39 per cent (from £23 to £32 per line per month) for a second operator to unbundle a GPON. The incremental cost increases by 3 per cent thereafter for each additional network up to 4 competing players.

Option 3 – introduce a specific condition requiring BT to deploy multiple fibres where it deploys its FTTP network

7.61 In addition to the general access obligations this option would set out a specific requirement on BT to deploy multiple fibres where it deploys its FTTP GPON network and to subsequently offer unbundled access to this fibre. It would, therefore, provide certainty to the market that the regulator considers this form of network access to be appropriate.

7.62 There has been little firm interest in fibre unbundling to date. However, there could be an advantage to this requirement to build extra capacity, as it would allow for any future demand to be met, in what is a nascent and evolving market.

7.63 This would provide CP with fibres that are always connected to end users. In this way a CP could avoid the high labour costs of connecting/reconnecting end users. It would also provide a better opportunity to gain economies of scale, as a CP would have access to large numbers of customers, connected at one point (the exchange); and could avoid the high operating costs of connecting/reconnecting them.

7.64 However, there would also be disadvantages to this option. An incremental upfront cost would need to be incurred to meet this requirement, as BT would need purchase and install fibre beyond what it needs to meet its own requirements. There is also the question about how many multi-fibres should be installed and in which part of the

[83] See *Analysys Mason, Competitive models in GPON, December 2009* for assumptions. These figures are calculated on a cost per line per month basis. Take-up assumptions: *66% of UK,* 25% of homes*, 80% broadband penetration, 35% cable share.*

network - this is likely to be particularly pertinent given the likelihood of there being little if any information on likely demand at the point of deployment.

7.65 If demand for the fibre was not forthcoming then the incremental cost of installing it would be wasted. This would not be an efficient outcome, and could result in poor outcomes for consumers.

7.66 However, perhaps the most likely and severe risk, in practice, is the impact on BT and the disincentive BT may face in investing in its FTTP network in the first place. The same analysis considered earlier[84] suggests that unbundling of multi-fibre[85] on a GPON is likely to become attractive to a CP only where it has a sizeable market share, under certain favourable conditions. Such conditions would include high coverage; high duct re-use; and also roll-out in densely populated geo-types. In the context of these testing conditions for deploying a FTTP network, the threat of competition and high cost of investing in multi-fibre, could undermine BT's rationale for investment, especially where consumers demand for FTTP products is unproven. This outcome could potentially deter early investment in FTTP and would not be in the interest of UK consumers.

Summary

7.67 There are three basic fibre access options to consider:

- Rely solely on the general access obligations;
- Introduce a specific condition requiring BT to unbundle its GPON end user fibres at the passive optical splitter; and
- Introduce a specific condition requiring BT to deploy multiple fibres where it deploys its FTTP network.

7.68 In reaching a view on which fibre access option is most appropriate, it is necessary to take a broader view of all the possible WLA remedies. This is done in Section 8.

Sub-loop Unbundling (SLU)

Description

7.69 Sub loop unbundling ('SLU'), like LLU, allows CPs to take either full access or shared access to an end users' local copper access connection. However, for SLU, the CP accesses this service at an intermediate point in BT's access network - between the end user premise and the exchange (serving MDF site). In most cases this intermediate point will be a BT street cabinet. This enables CPs to install equipment at a location which is closer to the end user premise thus shortening the length of the local copper access connection. This in turn will enable higher broadband speeds to be supported. The CP will then need to establish a fibre backhaul connection from the intermediate point (street cabinet), thus creating a fibre to the cabinet (FTTC) network.

[84] *Analysys Mason, Competitive models in GPON*, December 2009
[85] The multi-fibre scenario discussed here is 'unbundling at the cabinet'. However, the same report suggests that multi-fibre is likely to be even higher if unbundling occurs at the exchange, and so is relevant.

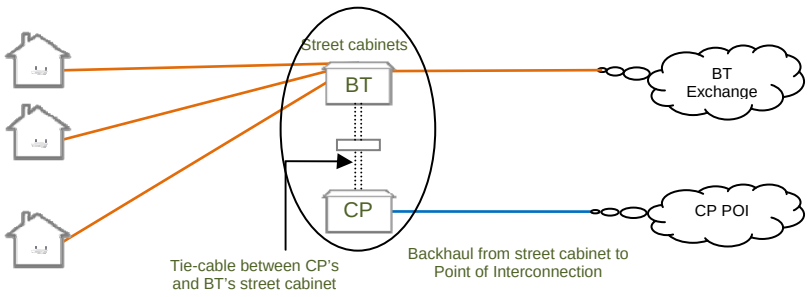
7.70 There is, however, a cost associated with the speed advantage offered by SLU, in that SLU requires a CP to deploy active equipment (e.g., VDSL DSLAM) nearer to the end user (e.g., in the street cabinet rather than in the local exchange). This creates a number of challenges. For example, there is a need to establish suitable accommodation for the active equipment (e.g., space, weatherproofing, temperature range, etc). There is then a need to get power into this accommodation to supply the active equipment and to install a fibre backhaul connection between this accommodation and the local exchange (or another suitable aggregation point). These problems are then exacerbated by the fact that there are considerably more street cabinets than local exchanges (c.90,000 compared to c.5,600), which is a consequence of moving the equipment closer to the end user. These factors mean that the cost of deploying an SLU-based network is likely to be considerably higher than the cost of deploying an LLU exchange-based network.

7.71 BT was originally required to provide SLU in January 2001 by EC Regulation 2887/2000 and published its initial RO at this time. Subsequently, BT has been required to provide SLU as an LLU service in the 2004 WLA Statement. To date there has been very limited take up of the service.

7.72 The current SLU requirement on BT does not specify a specific SLU product or arrangement. Rather it has been kept general so as to allow CPs to determine the arrangements that best suit their needs, which they are then able to request.

7.73 However, within its current RO BT has specified a particular SLU arrangement and this allows CPs to deploy FTTC networks, based on SLU, independently by requiring them to install their own street cabinet next to or near an existing BT street cabinet. The CP cabinet would house a CP's equipment (e.g., VDSL DSLAM) and would be connected to BT's street cabinet by tie cables in order to allow interconnection with the copper sub-loops. This arrangement is illustrated in Figure 7.5.

Figure 7.5 SLU arrangement currently offered by BT



7.74 Although BT currently only offers the SLU arrangement that it has specified, other SLU arrangements may be possible and CPs are able to make reasonable requests for such other arrangements. However, the SLU arrangements which are possible very much depend on various local factors, such as the condition and position of BT's street cabinet, and/or whether BT or any OCPs have previously deployed a FTTC network in the area. A few examples of alternative SLU arrangements and the local factors that may be needed to support them are discussed below.

Single CP deployment

- In this situation only one CP intends to use SLU and deploy a FTTC network. The current SLU arrangement offered by BT is potentially well-suited to this situation. However, in some cases, depending on the condition and location of BT's street cabinet, it may be possible for the CP position its cabinet right next to the BT cabinet, or even integrated with the BT cabinet. This could simplify the tie cable arrangements between BT's cabinet and the CP's equipment.

CP deployment in an area where BT has already deployed FTTC

- In this situation BT has already deployed a FTTC network. In such a situation it may be possible for the CP to share some of the FTTC infrastructure that has already be installed by BT. For instances, there may be space in BT's equipment cabinet that could be rented to the CP and/or it may be possible for the CP to share the power and backhaul provisions which BT has installed.

Multiple (non-BT) CP deployments

- In this situation more than one CP wishes to use SLU, but BT has not deployed a FTTC network itself. In this situation the individual CPs could choose to coordinate and/or share any infrastructure deployments if they wished. This would, however, be a commercial matter between the individual CPs.

7.75 To date, take up of SLU has been very limited, both in terms of geographical coverage and number of sub-loops unbundled. However, some rollout of FTTC services, based on SLU, is planned by organisations as part of regional broadband initiatives, such as Digital Region[86], which is intending to roll out FTTC services in 2010.

7.76 There is also the potential for the level of demand for SLU to increase as demand for higher speed services increases. For example, SLU would allow competing CPs to deploy FTTC networks in order to provide competing services to the market(s) and it would be possible for either a single CP to deploy a FTTC network, thus providing new and additional competing service, or multiple CPs to each deploy a FTTC network in competition with one another.

Economic viability of SLU

7.77 As briefly discussed above, the cost of deploying a network based on SLU is likely to be considerably higher than the cost of deploying a network based on LLU at the exchange. This is because with SLU there is a need to accommodate active equipment (e.g., VDSL DSLAM) in street cabinets and this creates a number of problems. For example, there is a need to establish suitable accommodation for the active equipment (e.g., space, weatherproofing, temperature range, etc). There is then a need to get power into this accommodation to supply the active equipment and to install a fibre backhaul connection between this accommodation and the local exchange (or another suitable aggregation point). These problems are then exacerbated by the fact that there are considerable more street cabinets than local exchanges (c.90,000 compared to c.5,600), which is a consequence of moving the equipment closer to the end user. It is also likely to be the case that the operational cost associated with an SLU-based network will be higher, as there will be a greater

[86] http://www.digitalregion.co.uk/index.html

number of equipment sites (cabinets) to maintain. These factors have the effect of increasing the unit cost of an SLU-based network.

7.78 However, the fact that a network based on SLU may cost more than a network based on LLU at the exchange is not necessarily a problem in its own right. This is because an SLU-based network will be able to deliver higher end users connection speeds and accordingly will be able to support a more comprehensive range of applications and services. The real test, therefore, is whether the value of the additional applications and services that can be supported on an SLU-based network is higher than the additional cost associated with an SLU-based network.

7.79 This is not an easy question to answer at the present time given the nascent state of demand for higher speed applications and services. However, there has recently been a surge of interest in deploying networks to support higher speed applications and services. We therefore cannot rule out the possibility that SLU will become an attractive proposition at some point in the future.

Cost of competition based on SLU

7.80 Another useful economic test is to assess the prospects of downstream competition being based on SLU. That is, what is the prospect of multiple CPs each deploying a FTTC network, based on SLU, such that they create effective and sustainable competition. Such an analysis is discussed in detail in Annex 9.

7.81 The analysis in Annex 9 shows that, for a given set of assumptions, the cost for one CP for deploying equipment in a street cabinet and connecting this to a (full) sub-loop is £11.70 per end user per month. However, if four CPs were each to deploy their own equipment in a street cabinet then the average cost per user is likely to increase by between 37 per cent (£4.28) and 79 per cent (£9.28), depending on whether the CPs share a cabinet or deploy their own cabinet. This cost increase is due to factors such as; duplication of equipment and labour, lower network utilisation and increased end user churn costs. The cost increase associated with multiple CPs compared to a single CP we refer to here as the cost of competition.

7.82 Given the current nascent state of demand for higher speed applications and services and given our understanding of the cost of deploying equipment in a street cabinet, as set out in Annex 9, the prospect of multiple CPs each deploying a FTTC network, based on SLU, seems unlikely in the short term. However, if demand for higher speed applications and services was to take off and/or if the cost of deploying a FTTC network decreased (e.g., due to reduced equipment costs) then the prospects for competition based on SLU would improve.

SLU Options

7.83 There are three basic SLU options to consider:

- Rely solely on the general access obligation, which means that we would essentially remove the current specific SLU requirement;
- Maintain the current specific SLU requirement without change; and
- Extend the current SLU requirement by further specifying the SLU product(s) that BT should provide.

Option 1: Rely solely on the general access obligations

7.84 As we currently have a specific SLU requirement this option would essentially lead us to removing this specific option. However, it would not necessarily mean that BT would not be required to provide SLU, as CPs would still be able to make reasonable requests for SLU type access under the general access obligation.

7.85 This option is likely to be appropriate if it is considered there is unlikely to be significant demand or interest for SLU in the period covered by this review, This is because if there is not likely to be any significant demand for SLU then it would be disproportionate to require BT to develop and maintain an SLU product and RO.

7.86 Conversely, if there is likely to be demand or interest for SLU then this option would not provide sufficient regulatory certainty to the market. Further, given that BT has already developed an SLU product and RO the incremental cost of maintaining these is likely to be low. Hence, the level of demand for SLU would not need to be high to justify maintaining the current requirement.

Option 2: Maintain the current specific SLU requirement

7.87 In addition to the general access obligation this option would set out a specific requirement on BT to provide SLU, but would not specify any specific SLU products or arrangement.

7.88 It would, therefore, provide certainty to the market that SLU is a form of access that the regulator considers to be appropriate, but would then allow CPs to work out the arrangement(s) that best suits their needs, which they could then request. Maintaining this requirement on BT to provide SLU could reduce the entry barriers for OCPs wishing to provide telecommunication services to consumers. This would, therefore, allow them to enter new markets and expand their businesses.

7.89 This option is appropriate if we consider that there is likely to be sufficient demand and interest in SLU, in the period covered by this review, but where the specific SLU products and arrangement that CPs are likely to require are currently unclear.

7.90 We know that some rollout of FTTC networks, based on SLU, is planned by organisations as part of regional broadband initiatives, such as Digital Region. We also know that BT plans to rollout FTTC across about 30 per cent of its network, about 7.5m premises by the end of 2012. Further, there has recently been a surge of interest in deploying networks to support higher speed applications and services. All of these factors are likely to result in increased interest in SLU.

7.91 This requirement on BT would require it to develop and maintain products and processes upon demand and to enter into contractual relationships with OCPs. These requirements could, therefore, have the affect of diverting BT's resources away from its planned and prefer commercial activities. However, BT would be financially compensated when it provides SLU, due to the proposed pricing approach. Thus, once the demands for SLU are understood BT would be able to properly resource it, such that it does not adversely affect its other commercial activities.

7.92 A requirement on BT to provide SLU would promote competition in the supply of fixed telecommunications services. This would benefit consumers in terms of increased choice of provider and a wider range of products with improved quality of service and better value for money.

Option 3: Extend the current SLU requirement

7.93 In addition to the general access obligation this option would set out a specific requirement on BT to provide SLU and would then go on to specify specific SLU products or arrangements that BT should provide. It would, therefore, provide certainty to the market that SLU is a form of access that the regulator considers to be appropriate and would identify the arrangement(s) that best suits the needs of CPs demanding the service.

7.94 This option is appropriate if we consider that there is likely to be sufficient demand and interest in SLU, in the period covered by this review, but where there is also known demand for specific SLU products and arrangements at the current time.

7.95 As discussed under option 2, we know that there is already some interest and planned demand for SLU and there are good reasons to believe that demand and interest is likely to increase over the next few years. However, it is not yet clear which SLU products and arrangements are likely to ultimately best suit the needs of CPs.

Pricing for SLU

7.96 In Section 6 we set out our proposed general approach for basis of charges, where we consider that the most appropriate basis for setting the charges for the services in the WLA markets is LRIC+.

7.97 However, in Section 6 we also recognise that LRIC+ charges are not necessarily appropriate in all cases. In particular, LRIC+ might not be appropriate when the market is new and innovative.

7.98 SLU allows CPs to take either full access or shared access to an end users' local copper access connection. In most cases these local copper access connections have been in place for many years in order to provide telephone services and more recently broadband services. Therefore, generally we do not consider that SLU is requiring BT to do anything new or innovative. We therefore consider that LRIC+ is the most appropriate basis for setting the charges for SLU.

7.99 However, we do recognise that where BT has made recent investments to upgrade its street cabinets to support FTTC, such investments may be considered new and innovative. Thus, it may be appropriate for the changes for services that are only available as a consequence of BT's own FTTC investment to include a suitable risk premium.

7.100 A further consideration is whether an SLU charge control is necessary in addition to the general cost orientation obligation. An SLU charge control would provide additional certainty to the market. However, as previously discussed demand for SLU to date has been very limited and consequently there is currently very little financial information available on the cost of providing SLU. We therefore consider that it is too early for us to be able to set a meaningful SLU charge control.

7.101 We are aware that recently some CPs have expressed concern over some of BT's published SLU charges. These concerns seem to mainly relate to ancillary services, such as surveys and footway box and duct re-arrangements, rather than the core SLU access services. We consider that, in the short term, the specification and charges for the various ancillary services will be best resolved through industry negotiation backed up by our dispute resolution powers. In the longer term, if

sufficient demand for SLU does materialise it may then be appropriate to consider te case for introducing an SLU charge control.

Summary

7.102 There are three basic SLU options to consider:

- Rely solely on the general access obligation, which means that we would essentially remove the current specific SLU requirement;
- Maintain the current specific SLU requirement without change; and
- Extend the current SLU requirement by further specifying the SLU product(s) that BT should provide.

7.103 In reaching a view on which SLU option is most appropriate in is necessary to take a broader view of all the possible WLA remedies and this is done in Section 8.

7.104 In terms of pricing we consider that the charges for SLU (if it is required) should be cost oriented on the basis of LRIC+, but that it is too early to set charge controls.

Physical infrastructure access obligation on BT

Introduction

7.105 Fixed access networks are generally deployed in underground ducts or overhead on telephone poles. This physical infrastructure is costly to deploy and constitutes a large proportion of the overall capital expenditure of an access network, typically of the order of 50 to 70 per cent[87].

7.106 BT has an extensive physical infrastructure network that reaches most homes and businesses in the UK outside the Hull Area. BT's ability to reuse this legacy infrastructure, much of which predates market liberalisation, gives BT a significant advantage over its competitors for NGA network deployment.

7.107 A Physical Infrastructure Access (PIA) Obligation would require BT to allow OCPs to deploy NGA networks in the physical infrastructure of its access network. This type of physical wholesale product would enable CPs to compete at an even deeper level than the other products discussed earlier in this section.

7.108 Allowing OCPs to use the physical infrastructure in BT's access network would promote competition and investment in NGA network deployment by removing a significant barrier to infrastructure deployment and would put BT's competitors on a similar footing to BT.

7.109 A PIA product is often referred to as 'duct-access' though in fact it could encompass poles as well as the chambers associated with both ducts and poles. In this section we use the term 'duct access' to refer to ducts and their associated chambers, and 'pole access' to refer to poles and their associated chambers. We use the term 'Physical Infrastructure Access' to refer to both duct access and pole access.

[87] In the Super-fast Broadband statement, we discuss the opportunities presented by duct access and the challenges in realising them. Deploying the passive infrastructure – ducts, poles, etc. – is estimated to represent between 50 and 70% of the costs of building out NGA infrastructure.

Wider context

7.110 In this document we are examining the case for infrastructure sharing in the context of our WLA market review. Our powers to impose infrastructure sharing are limited to those providers designated as having SMP. Therefore in this consultation, we consider only whether BT and KCOM should be subject to infrastructure sharing obligations, as these are the only providers provisionally identified as having SMP in the WLA market.

7.111 We recognise there is a wider debate about the potential for infrastructure owned by other organisations to play a role in enabling NGA network rollout.

7.112 Infrastructure networks owned by other organisations outside the communications sector such as power and water utilities fall outside our remit. Therefore regulatory intervention in support of infrastructure sharing for these organisations would be a matter for the Government.

7.113 As discussed in more detail in Annex 5, the EU regulatory framework has recently been amended and the amendments have to be translated into UK law by May 2011. One of the amendments relates to infrastructure sharing, widening NRAs powers so that they can require any CP to share its physical infrastructure rather than just CPs designated as having SMP. Once the amendments have been enacted into UK law, we will therefore be able to consider whether any further infrastructure sharing obligations would be appropriate.

Assessment

7.114 In the Super-fast Broadband statement and preceding consultation document, we examined the potential for physical infrastructure remedies, including duct and pole access. As part of this work, we commissioned a sample survey of certain sections of BT's physical access network infrastructure to assess its suitability and capacity to accommodate NGA network deployments. Based in part on the findings of the survey, we concluded that there would be significant practical challenges but that duct access has the potential to form an important input for those considering new access infrastructure construction. We therefore decided to investigate its feasibility further.

7.115 Since the publication of the Super-fast Broadband statement we have therefore undertaken further research and stakeholder engagement in order to get a better understanding of the potential of a PIA Obligation. We also commissioned:

- research into the use of physical infrastructure sharing in other countries;
- a second sample survey of BT's access network physical infrastructure to assess its suitability and capacity to accommodate NGA network deployments; and
- an external assessment of the economics of physical infrastructure access.

7.116 We describe the findings of this work in more detail in Annex 10. We have also published the two external consultants' reports alongside this consultation (see Annex 10 for details).

Infrastructure sharing in other countries

7.117 We found that infrastructure sharing has been a long established feature of communications network deployment in Australia, Canada and the USA and that it has been introduced more recently in Portugal, France and Spain.

7.118 Infrastructure sharing in each country has its own particular variations and historical context which makes it difficult to infer the likely take-up in the UK, based on the international experience. For instance, much of the infrastructure sharing in Canada is by cable TV companies who were originally obliged to have their access networks built and managed by Canadian incumbent operator Bell Canada. In more recent years, the cable TV companies have purchased their access networks and now rent capacity in and on Bell Canada physical infrastructure.

7.119 Perhaps the most useful lessons come from Portugal and France where the incumbent telecom operators are subject to a regulatory obligation to share their physical infrastructure. The experience of these countries illustrate that, whilst there are significant practical challenges, workable infrastructure sharing arrangements can be implemented.

Demand for Physical Infrastructure Access in the UK

7.120 Historically, there has been very little demand for access to BT's access network physical infrastructure. Our predecessor regulator Oftel consulted stakeholders on duct and pole sharing in 1996[88]. In its 1997 statement[89] Oftel concluded that there was insufficient demand to require BT to share its physical infrastructure. However, Oftel acknowledged the potential benefits and encouraged BT and other operators to make capacity available to each other on a commercial basis.

7.121 Oftel issued updated guidance in 2002 in response to a request from the Broadband Stakeholders Group[90]. Oftel encouraged commercial sharing arrangements but again decided against formal intervention citing a lack of demand and practical considerations.

7.122 More recently, there has been renewed interest in access to BT's physical infrastructure, in the context of NGA network rollout.

7.123 In our Super-fast Broadband Statement, we reported that responses to the preceding consultation included the first public interest in PIA from UK CPs, albeit from only two respondents.

7.124 During the last year, the level of interest in sharing BT's access network physical infrastructure appears to have been maintained and has possibly increased as evidenced by the interest from CPs in the Broadband Stakeholder Group[91] work on physical infrastructure sharing. However, demand remains limited with most CPs apparently regarding non-physical NGA remedies as more important.

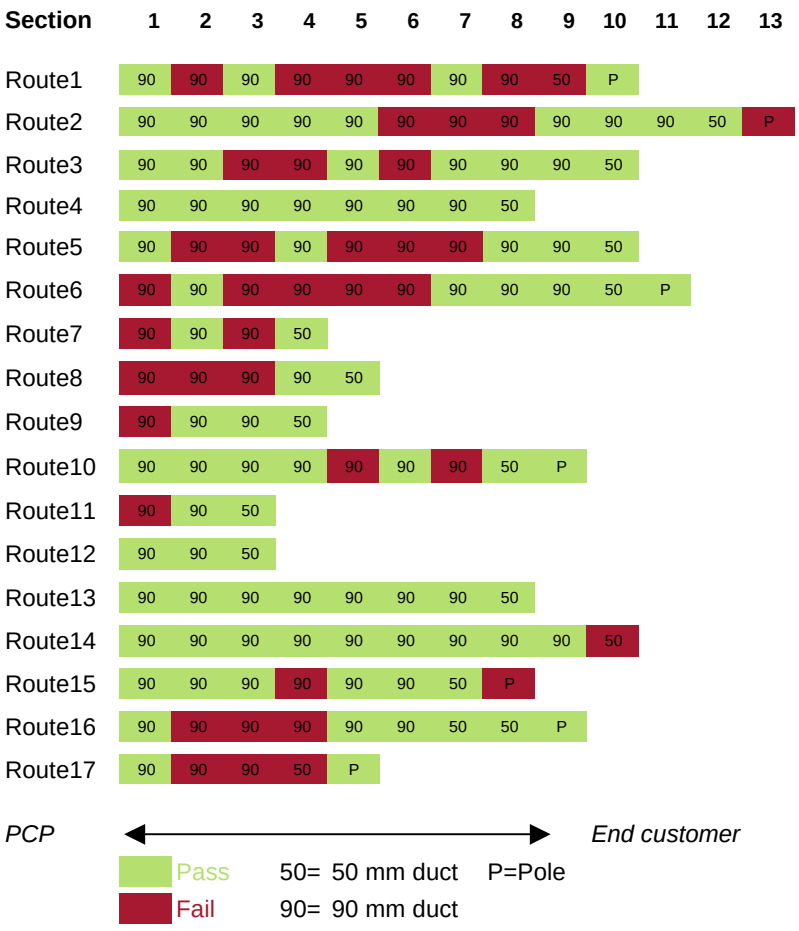
[88] Duct and Pole Sharing: A Consultative Document, February 1996.
http://www.ofcom.org.uk/static/archive/oftel/publications/1995_98/competition/ductpole.htm
[89] Duct and Pole Sharing, October 1997
http://www.ofcom.org.uk/static/archive/oftel/publications/1995_98/competition/dp1097.htm
[90] Duct and Pole Sharing: A guidance note on Oftel Policy, June 2002
http://www.ofcom.org.uk/static/archive/oftel/publications/ind_guidelines/duct0602.htm
[91] http://www.broadbanduk.org/

Suitability of BT's physical infrastructure to accommodate NGA deployments

7.125 Our sample surveys of BT's access network infrastructure found that there was a significant amount of unoccupied capacity in the access network ducts, chambers and poles surveyed. However, the availability of spare capacity varied significantly from geographic area to area and between individual duct sections, chambers and poles. Importantly, the surveys found that despite the overall high level of unoccupied capacity, in most routes surveyed, there were congested sections of duct, indicating that it would be necessary to undertake some incremental construction work to bypass these congested sections when deploying NGA networks.

7.126 This is illustrated in Figure 7.6 below for 17 of the routes between cabinets and DPs that were surveyed as part of our second duct survey. The red segments have the least unoccupied space, and therefore the highest risk of being unsuitable for reuse. Only 3 of the 17 routes surveyed had unoccupied space in all segments along the route and most lacked unoccupied space in multiple sections.

Figure 7.6 Segment by segment illustration of unoccupied space in D-side ducts from duct survey



7.127 It is important to note that although every effort was made to ensure the sample was as representative as possible, the sample represents only a small fraction of BT's network and is not large enough to be statistically representative of the whole network. We consider that the results are indicative, but no firm conclusions may be

drawn about the unoccupied space in the majority of ducts and poles that were not surveyed. The unoccupied capacity measurements are also illustrative, being based on surveyors' observations and a set of simplified rules to calculate the amount of usable space. Obstacles that could not be observed by the surveyors such as collapsed ducts and kinked cables would reduce the usable capacity. In practice it would be necessary to develop detailed engineering rules which may have the effect of further reducing the usable capacity.

7.128 There are several other factors that need to be taken into consideration when interpreting the results from the sample surveys as they potentially have implications for the usability of BT's access network physical infrastructure:

- **Overhead final drops** - We understand from BT that approximately 50 per cent of premises are served by overhead final drops (i.e., overhead wires suspended between telephone poles housing a final distribution point and customer premises);

- **Electricity pole overhead distribution** - a minority of BT's overhead final drops are served from poles that carry electricity supply lines. As these 'power poles' belong to electricity utilities they would fall outside the scope of the PIA obligation and CPs would need to seek commercial agreements with the electricity utilities in order to use them;

- **Direct buried final drops** - BT has also told us that it estimates that there are between 5 -10 per cent of final-drops (between final distribution points and premises) which may be served by cables that are directly buried in the ground without ducts;

- **Small-bore final drop ducts** – We understand that in some parts of the BT network that small bore final drop ducts (25mm diameter) installed prior to 1968 may be present. These have little unoccupied capacity for additional cables;

- **Direct buried distribution cables** – We understand from BT that although it generally uses ducts in its access network, that a minority of routes, mainly between cabinets and distribution points, would not be suitable for sharing because cables have been buried directly in the ground without ducts; and

- **Overhead distribution** – around 12 per cent of routes between cabinets and distribution points use overhead distribution (i.e., multiple cable spans between poles along the routes).

7.129 These factors suggest that not all sections of BT's physical infrastructure would be suitable for sharing and therefore a significant amount of construction would also be required to deploy NGA networks. The suitability of the final-drop sections of BT's physical infrastructure for sharing is particularly important as these sections of the access network makes up a large part of the access network infrastructure cost because unlike other sections closer to the exchange that serve many premises a separate 'final drop' is required for every building.

7.130 The widespread use of poles means that much will depend on their suitability to accommodate additional CPs' infrastructure and CPs' willingness to use overhead distribution for final drops. Preliminary indications from our survey are that most BT telephone poles could accommodate additional drop wires, however detailed engineering rules would need to be developed to ensure that additional plant could be safely accommodated.

7.131 In conclusion, our indicative surveys of BT's ducts and poles show that there is a significant amount of unoccupied space that could potentially be used to accommodate NGA network deployments. However, prior to the development of detailed engineering rules, there is uncertainty about how this would translate into usable capacity, particularly in relation to poles. It is also clear that while PIA could considerably reduce the amount of new infrastructure construction required to deploy an NGA network, a significant amount would still be required to relieve congestion and on routes where cables are directly buried without ducts.

Economic assessment

7.132 The economic assessment undertaken by CSMG compared the cost of deploying an NGA network in shared physical infrastructure with deployment in newly built physical infrastructure and with the cost of supplying customers using a non-physical wholesale NGA product[92].

7.133 The analysis demonstrated that NGA network deployments are characterised by high fixed costs, of which the major component is the physical infrastructure. CSMG found that shared infrastructure access would offer significant savings on the capital cost of network deployment compared with new build physical infrastructure and would therefore be an attractive option for a CP committed to infrastructure deployment.

7.134 However, CSMG found that NGA network deployment based on infrastructure sharing compared less favourably in cost terms with a wholesale NGA product. For its modelling, CSMG used BT's current GEA service. The modelling showed that a shared infrastructure based NGA network deployment would have significantly higher fixed costs for a CP than the GEA product at current prices, even under very favourable assumptions about infrastructure sharing. These fixed costs mean that a shared infrastructure NGA network deployment would be more expensive for a CP than GEA at all but high customer penetration. For the urban scenario modelled the break-even point at which the shared infrastructure NGA deployment became competitive with GEA was at 24 per cent of all households in the district and for the suburban scenario the break-even point was at 40 per cent of all households in the district. As both the urban and suburban scenarios were based on street cabinet districts that are significantly larger than the UK average, it is likely that the cross-over point would be higher in most districts. Figure 7.7 illustrates the annualised cost per home connected using new build, duct access and GEA for the urban geotype modelled by CSMG.

7.135 CSMG also examined the static cost of competition, (i.e., the overall additional cost collectively incurred by CPs from duplicative investment in network infrastructure) for more than one supplier to provide NGA services. This demonstrated that considerable cost can be avoided through infrastructure sharing compared with new build deployment. However, whilst infrastructure sharing would avoid duplicative investment in duct networks, CPs would continue to duplicate investment in the fibre and active elements of their networks which drives up the cost of competition. This cost of this duplicative investment is significant. In the scenario modelled by CSMG, having four competing networks instead of one would result in the cost per end user doubling. Figure 7.8 illustrates this for the urban cabinet district modelled.

[92] Using BT's GEA product as a comparison

Figure 7.7 Annualised cost per home connected to CP[93]

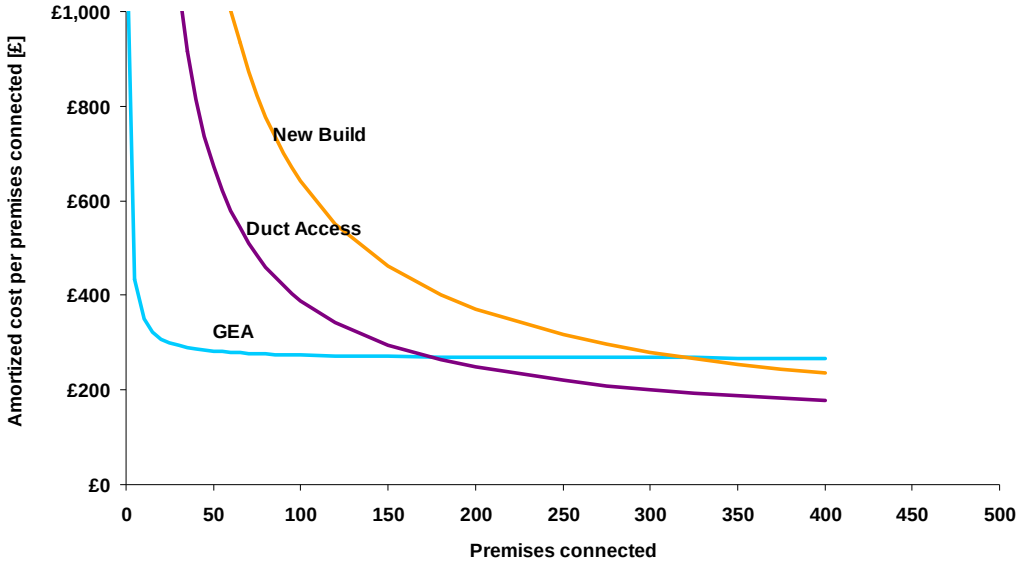
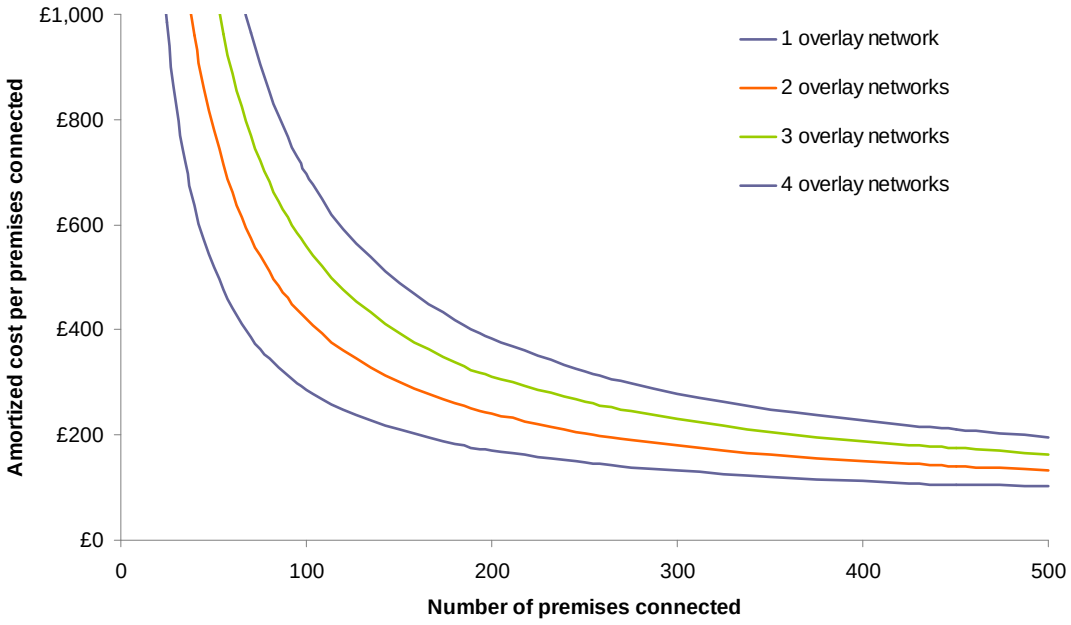


Figure 7.8 Overall annualised cost per connection: duct access, urban geotype[94]



Overall assessment

7.136 A PIA obligation could allow CPs to significantly reduce the capital cost of NGA deployment relative to new build infrastructure, whilst allowing them to retain most of the benefits associated with deploying their own networks such as flexibility and ability to innovate.

7.137 However, the analysis indicates that a shared infrastructure-based NGA network deployment would only be cost effective, when compared with a wholesale NGA

[93] A cabinet district in an urban area serving 500 premises.
[94] A cabinet district in an urban area serving 500 premises.

product such as BT's GEA, at a high level of take-up and assuming sufficient duct capacity is available. This suggests that it may be a less attractive option for CPs in areas where BT has deployed its own NGA network, at least while retail demand for NGA services remains uncertain.

7.138 A PIA obligation looks to be a much more attractive option for areas where BT has not deployed an NGA network. In these areas, a PIA obligation would significantly improve the contestability of the initial NGA network deployment by putting CPs on a more equal footing with BT. It could, therefore, allow them to enter new markets and expand their businesses.

7.139 A requirement on BT to provide PIA would require BT to develop and maintain products and processes upon demand and to enter into contractual relationships with OCPs. These requirements could, therefore, have the affect of diverting BT's resources away from its planned and prefer commercial activities. However, BT would be financially compensated when it provides PIA, due to the proposed pricing approach (see paragraphs 7.187-7.194). Thus, once the demands for SLU are understood BT would be able to properly resource it, such that it does not adversely affect its other commercial activities.

7.140 A requirement on BT to provide PIA would promote competition in the supply of fixed telecommunications services. This would benefit consumers in terms of increased choice of provider and a wider range of products with improved quality of service and better value for money.

7.141 In reaching a view on whether to introduce PIA, and in what form, it is is necessary to take a broader view of all the possible WLA remedies and this is done in Section 8.

EC draft recommendations on regulated access to NGA networks

7.142 When considering proposed remedies, we have had regard to the draft NGA Recommendation.

7.143 Specifically in relation to physical infrastructure access, the draft NGA Recommendation states that where operators are found to have SMP in Market 4, NRAs should:

- assess the availability of physical infrastructure including ducts owned by the SMP operator for the purpose of allowing alternative provider to deploy NGA networks;
- where physical infrastructure can be used to deploy NGA networks, NRAs should consult interested parties, in particular the SMP operator and potential access seekers, to assess the demand for access and the cost of access provision, as well as to establish operating procedures and parameters; and
- in accordance with market demand, NRAs should mandate access to physical infrastructure.

7.144 However, it should be borne in mind that the draft NGA Recommendation may change before the final version is published.

Proposed form of a PIA obligation

7.145 If we confirm that BT should be subject to a PIA obligation, we propose that we would require BT to meet reasonable requests for duct and pole access on cost-oriented and non-discriminatory terms, and to publish a RO (with some standard features and some specific to duct and pole issues).

7.146 Below we discuss the key characteristics that we consider that a PIA obligation, if implemented, should possess.

Design objectives

7.147 We consider that a well designed PIA Obligation and the resultant PIA Service should:

- Promote efficient usage of the existing access network physical infrastructure, avoiding capacity reservation or usage rules that unnecessarily 'sterilise' spare capacity;
- allow BT and CPs to reserve spare capacity in existing infrastructure on an equal basis;
- Promote efficient investment in new access network physical infrastructure;
- Not unduly hamper BT's NGA Network roll-out, for instance by preventing it from reserving spare capacity for its own NGA programme; and
- Provide for efficient maintenance of cables after installation.

Geographic scope and allowed uses

7.148 The purpose of the proposed remedy is to promote competition and infrastructure investment in the deployment of both FTTC and FTTP NGA access networks. We therefore propose that the geographic scope and the allowed uses of the remedy should be limited to this purpose.

7.149 We are therefore proposing that the scope of the remedy should encompass all infrastructure in BT's access network (i.e., ducts, poles and associated infrastructure such as chambers), where the access network is defined as the network between business and residential end users premises and their serving BT exchange. Physical infrastructure beyond serving exchanges would fall outside this scope. Thus, CPs would not be able to install cables in sections of BT's network outside the access network, for instance between local exchanges and metro-nodes.

7.150 We are proposing that use of the remedy should be limited to the deployment of access networks for:

- Broadband and telephony services; and
- SLU backhaul services between cabinets and serving MDF sites.

7.151 Thus operators would not be able to use the remedy to install cables for other purposes. The installation of cables for backhaul circuits or leased lines would not be permitted. We would consider whether it would be appropriate to extend the scope of the remedy to other services in the relevant market reviews.

Technology neutrality

7.152 Whilst in practice we would expect that the remedy would be used for the deployment of optical fibre cables networks, we are proposing a technology neutral remedy. Thus CPs would also be permitted to deploy other types of communications cable such as coaxial cables.

Arrangements for cable maintenance

7.153 CPs would need to be able to maintain their networks so processes for cable maintenance would be an essential feature of the PIA service. These processes would be likely to include:

- arrangements for timely access to BT physical infrastructure for maintenance purposes; and
- temporary occupation of additional duct capacity to facilitate the installation of replacements for faulty cables and cable rearrangements.

7.154 As BT also requires spare capacity for cable maintenance and rearrangement purposes, a practical solution may be for BT to reserve capacity in each duct section that could be used by all CPs for maintenance and rearrangement purposes.

Capacity Reservation

7.155 There would also be a need to specify the rules and associated processes by which BT and CPs can reserve physical infrastructure capacity for new cable installation.

7.156 These rules would need to strike a balance between BT's need to reserve capacity for its NGA network rollout and other purposes and CPs need to reserve capacity for their NGA network rollouts. Similarly, in setting a time limit for capacity reservation, a balance would need to be struck between BT's and CPs' requirements to be able to plan ahead whilst avoiding reservation of capacity for overly long periods that may ultimately hamper NGA network rollout.

7.157 The rules should also ensure that spare capacity is used efficiently, ideally avoiding mechanisms that would lead to unnecessary 'sterilisation' of spare capacity.

7.158 Our view is that the capacity reservation rules should be symmetrical, allowing BT and CPs to reserve capacity on an equal basis. We think that in the first instance BT should propose capacity reservation rules for discussion with CPs as part of the proposed industry process.

New Infrastructure Construction

7.159 An important aspect of the scope of the proposed PIA obligation is the extent to which it should apply to new infrastructure construction. There are several aspects to this:

- whether BT should be required to construct new infrastructure to relieve congested duct/pole sections where there is firm demand from CPs;
- whether BT should be required to construct new infrastructure in locations where it currently doesn't have any and there is firm demand from CPs (e.g., to connect new properties);

- whether as part of its own infrastructure construction projects BT should be required to install additional capacity for OCPs (an 'over-build' requirement); and

- whether BT should be required to share any of the new infrastructure it constructs for its own NGA rollout.

7.160 We consider each of these aspects below.

Congested Infrastructure

7.161 It is inevitable that in some sections of BT's physical infrastructure, there will be insufficient space to meet CPs' requirements. Indeed, our duct surveys indicate that in practice it would be relatively common for at least one duct section in a cable route from exchange to DPs to be congested.

7.162 We therefore need to consider how BT and CPs would address these congested sections. One approach would be for CPs to install their own duct-runs alongside BT's to bypass the congested sections in BT's network and another would be for BT to relieve the congested sections. BT could potentially do this in several ways including:

- repairing existing unusable infrastructure such as collapsed ducts;

- recovering redundant cables;

- rearranging existing infrastructure; and

- installing new infrastructure.

7.163 In practice, the most appropriate method would be likely to vary according to individual circumstance. For instance, it may not be possible to recover a redundant cable and repairing unusable infrastructure may be faster and cheaper than rearranging existing cables.

7.164 It appears that either approach would be practicable but given the range of options available to BT, and the need to connect new duct to existing BT chambers, in our view it would be more efficient for BT to relieve congested sections. A further factor is that CPs installing parallel duct runs to by-pass congested sections would probably need to install chambers at either end of their duct runs making this approach more expensive than BT provided ducts which would be connected directly to the existing chambers.

7.165 On balance, our view is that BT should be required to relieve congested infrastructure if requested to do so by a CP. In such circumstances it is likely to be appropriate for CPs to pay BT for the capital cost of any new infrastructure construction and to pay a rental charge that would reflect ongoing maintenance costs.

7.166 We recognise that there are likely to be a range of practical issues that would have to be taken into consideration. We therefore consider that in the first instance, BT should make a proposal for congested sections in its draft reference offer which can be discussed with industry.

New-build locations

7.167 A further consideration is whether BT should be required to construct new physical infrastructure for CPs in locations where it does not have any. Given the ubiquity of BT's access network it would seem likely that completely new physical infrastructure would be required mainly to connect new properties to existing BT infrastructure. Such projects might therefore range from installation of a lead-in duct to an individual property to larger new housing estate developments.

7.168 In our view, there does not seem to be a strong case for BT to be required to extend its physical infrastructure to new locations since there is no obvious benefit from BT carrying out the work and such investments could equally be carried out by OCPs or, as is often the case with new housing developments, by developers or partnerships between developers and CPs.

7.169 For very small projects such as the installation of lead-in ducts to individual new properties there may be a case for BT to install the infrastructure on grounds of practicality, given the small size of the projects and the need to connect the new infrastructure to existing BT infrastructure (typically by breaking into an existing chamber to connect a new duct). In our view, such arrangements could be agreed by BT and CPs as part of the implementation process.

Over-build requirement

7.170 A further consideration is whether or not, as part of its own physical infrastructure construction projects, BT should be required to install additional capacity to accommodate potential future demand from CPs.

7.171 The main argument in favour of this approach is that if the incremental costs are relatively low for BT to install additional duct capacity as part of its own duct construction projects, then an over-build requirement might be an efficient way of creating an option for future competition based on access to physical infrastructure. It is possible that these incremental costs will be low due to the fact that trench digging and reinstatement costs are a major component of the cost of installing duct infrastructure, and the cost of duct pipes is a relatively small component.

7.172 Over-build requirements have been adopted in other EU member states, for example in France and Portugal, where SMP operators France Telecom and Portugal Telecom are required to reserve capacity for OCPs.

7.173 The drawback of an over-build requirement is that a general obligation of this nature would not take account of demand from CPs for infrastructure sharing. There would be a risk that in areas of low demand, the additional duct may be under-utilised. Unless demand for infrastructure sharing proved to be widespread, there is a risk that the overall utilisation of the additional duct would be low making a general over-build requirement less efficient than a more targeted approach, even if the incremental costs of construction are low.

7.174 There are also several further factors that in our view tend to mitigate against an over-build requirement:

- Firstly, as previously discussed, our economic analysis indicates that CPs may find it hard to make a case for rolling out their NGA networks in favour of using a non-physical wholesale product from BT particularly until consumer demand for NGA services becomes more certain. Given the uncertain demand for

infrastructure sharing, it is debatable whether it would be proportionate for us to go beyond an infrastructure sharing requirement and apply an over-build requirement as well;

- There may be more interest in infrastructure sharing in areas where BT does not roll out its own NGA network. However, it seems likely that in the short term the bulk of BT's physical infrastructure construction projects will be in support of NGA network deployment and not therefore in areas where CPs would be most likely to require duct capacity; and

- Finally in the medium term, it is likely that BT would decommission its copper access network in areas where it has rolled out NGA networks, freeing up a considerable amount of duct capacity in the access network. This suggests that as an enabler of competition at least over-build duct would have a relatively short life.

7.175 Given the points above our view is that an over-build approach is not likely to be the most efficient approach at the current time.

7.176 In our view it is likely to be more efficient for either BT or CPs to install additional duct capacity in response to firm requirements. The congestion relief arrangements discussed above would be one approach. Another would a co-investment process such as has been adopted elsewhere, for example in Portugal Under this arrangement, BT would announce its infrastructure construction projects to CPs and would install additional capacity when in receipt of firm orders from CPs. BT and CPs would share the capital cost of infrastructure construction, and CPs would pay a lower ongoing charge for using the infrastructure that recognises their capital contribution.

7.177 In our view, a co-investment process would be an efficient way of providing additional capacity and would provide a useful compliment to the proposed congestion relief requirement. We therefore consider that it may be appropriate to require BT s to offer a co-investment process.

7.178 In order to implement a co-investment process a range of practical issues would need to be considered. These would include:

- Arrangements for announcing infrastructure construction projects;

- The time allowed for CPs to place orders after a project is announced. There may be some tension here between the time CPs would need to undertake their own planning activities and BT's desire to proceed with construction;

- Definition of the projects types that would be announced. It may be necessary to exclude some minor projects to avoid unduly delaying order fulfilment and repair activities; and

- Detailed arrangements for sharing investment costs and for ongoing charges.

7.179 We think these practical issues would be best addressed by BT and CPs. We therefore consider that in the first instance, BT should make a proposal for congested sections in its draft RO which can be discussed with industry.

Sharing new infrastructure

7.180 The final question in relation to new infrastructure is whether BT should be required to share any new infrastructure that it constructs for its own purposes such as NGA network rollout.

7.181 The issue here is the potential effect that a sharing requirement might have on BT's incentives in relation to new infrastructure construction.

7.182 We noted above that the incremental cost of adding additional capacity as part of an ongoing project is much lower than adding it at a later date when further digging and reinstatement would be required. It is therefore common practice for CPs including BT to install additional capacity in excess of their immediate needs in anticipation of future demand.

7.183 A requirement for BT to share new infrastructure might interfere with this process since BT would have less incentive to install spare capacity because of the risk that it would be used by a competitor and would also not be available for its own use when required. If a sharing requirement led BT to install less spare capacity the overall efficiency of its physical infrastructure investments may be reduced.

7.184 The extent to which this is an issue in practice would depend on the design of the PIA service, in particular the capacity reservation rules adopted. Also as noted above, in the medium term, recovery of the copper access network may free up a considerable amount of physical infrastructure capacity in areas where BT has deployed NGA networks. This suggests even absent a sharing requirement that BT may install less spare capacity than hitherto for infrastructure projects supporting NGA network rollout.

7.185 Our initial view is that the sharing requirements should apply equally to all BT access network physical infrastructure, however, as discussed in more detail below we consider there may be a case for some new physical infrastructure to be priced differently to existing physical infrastructure.

Reference Offer

7.186 To enable CPs to fully evaluate the suitability of the PIA Obligation for their purposes, we propose that BT should be required to produce a RO for its PIA service. We also think it is appropriate to specify a set of minimum requirements for the RO. We discuss these requirements in more detail in Annex 11.

Pricing of physical infrastructure access

7.187 We considered our approach to pricing of physical access products in the Super-fast Broadband statement concluding that wholesale pricing for physical products should reflect the level of risk at the time the investment was made, allowing opportunities to recover costs and earn a reasonable rate of return.

7.188 In line with these principles, we consider that cost-orientation is the most appropriate pricing approach for physical infrastructure access. We consider that the prices for PIAshould be designed to cover the efficiently incurred long-run incremental costs of providing physical products, including a return which reflects the associated risks, plus an appropriate contribution to common costs, including the common capital and operating costs.

7.189 This approach is in line with the draft NGA recommendation, which states that where NRAs mandate regulated access to new physical infrastructure; pricing should reflect a project specific risk premium.

7.190 Following on from these principles there are a number of more detailed questions about how prices for PIAwould be set in practice. While we cannot set out specific details on pricing for duct access in the consultation document, ahead of having a clear product specification, we think it would be useful to set out our initial thoughts.

Basis of charges

7.191 It order to encourage CPs to make efficient use of infrastructure capacity we think that charges for infrastructure usage should reflect the proportion of the usable capacity of the infrastructure that is occupied. This approach has been adopted in other countries and generally, charges for duct usage are based on the cross sectional area of the cable and the length of duct that is occupied. There are also often additional charges for cable joints and loops of cable that occupy space in chambers.

Investment risk

7.192 As noted above, we consider that the pricing methodology for PIA should reflect the risk associated with the original infrastructure investment. At a high level there would be three distinct cases:

- existing infrastructure, most of which is legacy infrastructure constructed for current generation services for which demand is well established and therefore investment risk was low;
- New infrastructure constructed solely for current generation services. As with legacy infrastructure, demand is well established and investment risk would be low; and
- New infrastructure constructed for new high bandwidth services for which in the short term at least demand is uncertain and therefore investment risk would be higher.

7.193 Given the higher risk associated with infrastructure investments relating to new high bandwidth services, we consider that in principle it should be treated differently from the infrastructure deployed for current generation services. In particular, to provide BT with a ‘fair bet’, accounting for the uncertainty and sunk costs of FTTP investment, prices should be set to earn a reasonable return on the basis of expected cash flows from investment at the time of deployment. In practice it may be necessary to seek to achieve this by using a risk adjusted costs of capital when setting charges in order to reflect the risk associated with NGA.

7.194 The practical application of this principle is likely to depend on the product specification and the operational processes adopted for PIA. In particular the ability to distinguish between each of the three categories of infrastructure identified above would be key. Ideally, infrastructure prices would vary according the investment risk but if it is not possible to distinguish between the categories of infrastructure then it would be necessary to adopt an alternative approach such as applying a cost of capital to all infrastructures which recognises the weighted average risk of the different categories of infrastructure. The efficiency benefits from ensuring that prices reflect the risk incurred by BT from investment in infrastructure would need to be

weighed against the practical costs associated with differentiating between different categories of infrastructure.

Implementation arrangements

7.195 We note that in February 2010 BT announced its willingness to offer an infrastructure sharing service and that BT and CPs have indicated their willingness to participate in preliminary discussions about infrastructure sharing during the consultation period. We think these could be very useful, helping all concerned get a better understanding of the issues that could inform responses to the consultation. They may also reduce the amount of time required to implement a PIA service in the event that we decide to confirm our proposals after considering respondents' views.

7.196 Based on experience with other complex remedies such as LLU, Carrier Pre-selection ("CPS") and Wholesale Line Rental ("WLR"), we think that once BT has developed an initial RO it would be beneficial to build in a detailed review of the service by an industry working group in order to refine the service to meet CPs' needs and to iron out the operational details.

7.197 We consider that BT should be required to produce a first version of its RO within three months of the publication of our statement for review by the industry working group.

7.198 One option is for the working group to be facilitated and supervised by the OTA, as it has successfully undertaken similar tasks in the past.

7.199 Once the working group has finished its deliberations, BT could then produce a revised RO. In our view two months should be sufficient for these revisions.

Draft implementation timetable

7.200 We therefore envisage the following implementation timetable for bringing the PIA service into operation (in respect of ducts):

- First Draft RO (3 months) – BT required to publish a draft RO that meets the minimum specification within 3 months of the market review policy statement;
- Industry Review (3 months) – Review of the draft RO by industry working group. We propose a three month review period, aimed at agreeing changes to the draft RO;
- Updated RO (2 months) – BT to produce an updated RO within two months of the conclusion of the industry review;
- Service Launch (8 months after policy statement) – most likely a soft launch starting with low order volumes to test the operational processes; and
- Ofcom Consultation/Statement – If necessary, we would consider any matters not agreed during the review period and consult on a direction settling these matters.

7.201 We recognise that the time required to complete the industry review and subsequent activities would be to some extent dependent on the issues that come up and the level of stakeholder engagement. We therefore propose that the target for BT to produce the first draft RO should be the only formal target specified in the SMP condition.

Service launch

7.202 Once the industry discussions have been concluded and BT has updated its RO, the PIA service could proceed with a commercial launch. As PIA would be a completely new service, maximum order volumes may be restricted initially to allow the operational processes to be tested and bedded-in.

7.203 For the avoidance of doubt, we would not expect BT to supply infrastructure sharing services to CPs except on a trial basis until it has updated its RO after the industry discussions.

Process industrialisation

7.204 Whilst there is clearly interest in a PIA service, at present the overall level of demand remains uncertain and may be low, at least initially whilst CPs trial BT's service and develop their business strategies. In order to keep the cost of the service to a minimum, we would expect BT to ensure that investments in operational processes and associated OSS are commensurate with demand. Thus we would not expect BT to spend large sums on OSS systems unless there is clear evidence of demand to warrant the investment.

7.205 One way of ensuring that BT's capability to fulfil orders is closely aligned with demand would be for BT to implement a demand forecasting process. Demand processes have been used successfully with other regulated products such as LLU and CPS.

Separate work streams for duct and poles

7.206 BT has indicated that defining access arrangements for poles is likely to be more complex and possibly more time consuming than for ducts due to the more complex engineering calculations associated with pole loading and the safety requirements associated with overhead working. BT has therefore suggested that implementation work should be split into two work streams.

7.207 Given the significant technical differences between duct and pole infrastructure we think it may be worthwhile having two work streams, particularly for the industry working group discussions which would be likely to be attended by different groups of specialists. However, we are mindful that CPs wishing to use the PIA service would be likely to wish to use both duct and poles given the high incidence of poles in BT's access network, particularly for final drops. We therefore think it is important that both duct and pole work proceeds in parallel to keep any delay to a minimum. We also think there would be value in gathering industry feedback at an early stage and therefore our preference is for BT to produce an initial version of the pole sections of the RO alongside the duct sections if at all possible.

7.208 In the event that the pole sections of the RO take longer to develop than the duct sections, our view is that BT should not delay publication of the duct sections enabling CPs to start using the service at the earliest possible date.

7.209 BT is still developing its plans but shortly before publication of this consultation its view was that it would need a further three months (i.e., six months from the policy statement) to develop the pole sections of its initial RO. We have therefore proposed that BT should be required to produce a RO for pole sharing within six months of the publication of our statement.

Review of PIA charges

7.210 Based on experience with implementation of other complex remedies such as CPS and LLU, we consider that there is a risk that BT and CPs may not be able to reach agreement about the charges for the PIA services. As in previous cases, it is likely that BT would regard its detailed charging calculations and supporting data as commercially sensitive and therefore decline to disclose them, making it difficult for CPs to have confidence that prices are consistent with the proposed cost-orientation obligations.

7.211 If this is the case, our intention is conduct a formal review of BT's charges in order to provide reassurance to industry and to avoid a dispute. Our review would be followed by a consultation on our conclusions with a direction setting the charges.

Reaching agreement on the PIA RO

7.212 Our strong preference is that BT should reach agreement with participating CPs on any necessary revisions to the RO. However in the event this is not possible it may be necessary for us to formally consider some aspects in a consultation following the completion of the industry review.

7.213 If this becomes necessary, the areas of disagreement could be considered in the same consultation as the charging consultation discussed above.

Virtual Unbundled Local Access (VULA)

Introduction

7.214 As discussed when assessing potential SLU and PIA obligations, there are significant incremental costs associated with deploying multiple competing FTTC and FTTP networks. This is particularly acute when demand for services based on these networks is low, as is likely to be the case in the early stages of deployment. Given this, competition in NGA-based services, in the short term at least, is likely to be best served by CPs sharing a single network. Thus, in areas where BT has deployed FTTC or FTTP there may be a case for requiring BT to provide access to these networks and such access would need to be some form of non-physical access product. This section considers such a non-physical access product as an SMP remedy in the WLA market.

7.215 A non-physical access remedy, in the WLA market, would seek to replicate many of the features of a physical access remedy, such as LLU, and accordingly should be flexible and capable of supporting innovation. This non-physical access remedy would therefore provide a virtual connection between the local serving exchange and each individual end user premise. We therefore have used the term 'Virtual Unbundled Local Access' (VULA) to describe this remedy.

7.216 The remainder of this section considers applying VULA as an access remedy where BT has deployed its NGA network as a regulatory option for addressing its position of SMP in the WLA market.

Description

7.217 In simple terms VULA provides a connection from the nearest 'local' aggregation point to the customer premise.

7.218 In a NGA context, this would be an Ethernet-based connection product where the CP (or access seeker) has access to 'empty' transmission frames over the physical link provided by the NGA network provider (or access provider). Whilst the transmission of the data would not be controlled by the CP, the structure of the transmission technology (Ethernet frame) would be.

7.219 This level of control would be sufficient to allow significant product differentiation and innovation, potentially similar to the opportunities available using physical access products. For example, the CP would be able to provide a multitude of different services over this connection, e.g., voice, video, internet services, and would still have total control over the dimensioning of the backhaul and core network that are needed to support these services.

7.220 As discussed below (from paragraphs 7.231), the closer to the customer the CP is, the greater the flexibility and control the CP has to innovate and differentiate in delivery of its services. Providing CPs with flexibility and the opportunity to innovate would make it much more likely that the benefits possible under VULA are realised.

7.221 LLU has proven to be an effective remedy in allowing competitors to offer competing services to consumers, based on CGA. Consumers have benefited from alternative providers offering different products and services and varying price levels. LLU also provided opportunities for innovation in the delivery and quality of those services, and in alternative providers own backhaul and core networks.

7.222 BT's NGA network is in its early stages of deployment. This differs from the CGA situation, in which LLU was introduced as a physical remedy on BT's legacy CGA network. We consider that physical NGA remedies could be used in some areas to deploy NGA infrastructure to support competition and investment. However, in other areas where BT has began to roll-out its NGA network, our analysis (summarised in detail in Annexes 9 and 10) suggests that there is a weaker economic case for alternative CPs to roll-out their own NGA infrastructure.

7.223 This would mean that in the absence of an alternative access remedy in this market, competitors would be reliant on downstream wholesale remedies, from the WBA market, in order to provide competing NGA broadband services to consumers. This could limit competition and accordingly limit the benefits afforded to consumers. Such an approach would also fail to replicate, for NGA, the benefits delivered by LLU in CGA.

7.224 This suggests that requiring a non-physical wholesale remedy, from the WLA market, is likely to be the most cost effective way to support competition in downstream markets in the situation where BT has deployed a NGA network.

Assessment of VULA

7.225 We consider that a requirement on BT to provide VULA would reduce the entry barriers for OCPs wishing to provide telecommunication services to consumers. This would, therefore, allow them to enter new markets and expand their businesses. We take this view because the evidence suggests that the costs of VULA for OCPs are likely to be significantly less than the costs of providing NGA based on some level of additional access network build, whether based on SLU or PIA.

7.226 The most effective way to support the development of downstream competition would be to provide significant scope for alternative providers to innovate and differentiate in how they package and deliver services. Therefore, we consider that the benefits of

VULA would be greater if it is provided as a 'raw' product, which allows OCPs s to decide key elements of their offering, such as: the level of bandwidth on offer; QoS; pricing levels; and the range of applications available. This would replicate many of the benefits delivered to consumers through LLU regulation.

7.227 We consider that VULA therefore has potential advantages over potential physical NGA remedies in terms of both higher benefits and lower costs. As a technologically-neutral remedy, VULA would also be relevant to both FTTC and FTTP deployments. This means that, based on current BT roll-out plans, it could support competition in more than 40 per cent of the UK.

7.228 A requirement on BT to provide VULA would require BT to develop and maintain products and processes upon demand and to enter into contractual relationships with OCPs. These requirements could, therefore, have the affect of diverting BT's resources away from its planned and prefer commercial activities. However, BT would be financially compensated when it provides VULA, due to the proposed pricing approach. Thus, once the demands for VULA are understood BT would be able to properly resource it, such that it does not adversely affect its other commercial activities.

7.229 We consider that a requirement on BT to provide VULA would promote competition in the supply of fixed telecommunications services. This would benefit consumers in terms of increased choice of provider and a wider range of products, with improved quality of service and better value for money.

7.230 In reaching a view on whether to introduce VULA, and in what form, it is necessary to take a broader view of all the possible WLA remedies and this is done in Section 8.

Key characteristics for VULA

7.231 We now set out the characteristics that we consider that VULA would need to have in order to meet the above objectives and to be consistent with the WLA market definition.

7.232 Clearly any remedy applied to the WLA market must seek to address effectively the competition concerns that we have identified in proposing that BT has SMP in this market. We consider that VULA would achieve this if its characteristics closely resemble the current LLU product in BT's CGA network. This is likely to maximise the benefits.

7.233 Given this we consider that the key characteristics for VULA - discussed in greater detail below - are as follows:

- *Local:* interconnection should occur locally;
- *Service agnostic:* should be able to support a multitude of services;
- *Un-contended:* dedicated capacity should be available to the end user;
- *Control of access:* sufficient control of the access connection should be made available; and
- *Control of Customer Premises Equipment ("CPE"):* sufficient control of CPE should be available.

7.234 We have previously undertaken considerable work to encourage industry to develop a common standard for wholesale bit-stream access. This standardised wholesale bit-stream access is known as active line access (ALA). Our most recent publication on ALA is a discussion document: *Ethernet Active Line Access: Updated Technical Requirements*, published on 3 March 2009[95]. Whilst ALA is not a regulatory remedy for a particular market failure, it has provided a useful reference when considering the key characteristics of VULA.

Local access

7.235 Interconnection, by the access seeker, should occur locally; that is at the first technically feasibly aggregation point. In practice this is likely to be in the local serving exchange where the first Ethernet switch is located[96]. This characteristic is necessary to ensure that the VULA is a remedy that is appropriate to the defined WLA market.

7.236 Interconnection at the local serving exchange means that CPs only purchase the access connection. It therefore allows competing CPs to arrange (or build) their own backhaul and core networks, maintaining their control over as many of the network elements used in providing the service as possible.

7.237 This provides competing CPs with complete flexibility over the architecture and dimensioning of the backhaul and core network elements. Further, to the extent that the VULA local serving exchange coincides with an LLU local serving exchange the CP would be able to combine additional VULA traffic with existing LLU traffic on their network.

7.238 Local interconnection also provides foundations which support some of the other key characteristics that we consider are necessary for VULA. For example un-contended access to capacity to a given end user would be more difficult to ensure as the point of interconnection moves deeper into the network.

Service agnostic access

7.239 The WLA market definition focuses on generic telecommunications access, rather than any particular service. Indeed, if we consider LLU today this can be used to support voice services, broadband services and even some low bandwidth leased line services – this is one of features that makes it so flexible and accordingly maximises the potential for innovation.

7.240 We therefore consider that, like LLU, VULA should be a generic access product. That is, it should provide service agnostic connectivity. VULA should therefore only be limited by the inherent capabilities of the access technologies deployed.

[95] http://www.ofcom.org.uk/telecoms/discussnga/eala/updated/updated.pdf

[96] Note that the local serving exchanges for NGA (FTTC and FTTP) will not necessarily be the same local serving exchanges as for CGA ('copper' loops). This is because fibre does not have the same distance limitations as copper and as such it is possible to carry the access connection over a greater distance and thus achieve a higher level of aggregation at the local serving exchange. For example, BT currently has c.5,600 local serving exchanges in its CGA network (these exchanges are where LLU can take place), however, BT plans to reduce the number of local serving exchanges to about 800 to 1000 in its NGA network.

Un-contended access

7.241 The connection, or capacity, between the consumers' premises and the local serving exchange where interconnection takes place should be dedicated to the end user, i.e., the connection should be un-contended.

7.242 The availability of an un-contended access connection, alongside the control options discussed below, would ensure that the full innovation benefits can be realised.

Control of access

7.243 Given the aim of realising competition benefits by allowing CPs maximum flexibility and innovation in their ability to offer differentiated products to consumers it is necessary for VULA to provide a high degree of access control to the interconnecting CP.

7.244 CPs would need freedom of control in order to provide different types of service and, potentially, also vary the QoS parameters in delivering those services to enable them to effectively compete with other providers.

7.245 It is possible that some control of the underlying technical elements of VULA would need to remain with the access provider (BT) to maintain network stability. However, allowing CPs the greatest freedom possible to alter certain control parameters, where possible, is critical to ensure that CPs are able to determine and control the type and level of service they provide.

Control of CPE

7.246 Similar to the control characteristic described above, allowing competing CPs the ability to control CPE is crucial in ensuring that the potential benefits of VULA are realised. Allowing CPs the freedom to choose CPE provides the flexibility needed to ensure CPs are able to differentiate how they deliver services to their customers.

7.247 Unnecessarily preventing, or limiting, the control CPs have over CPE risks undermining some of the benefits to consumers that VULA may provide. Restricting the type of CPE (other than in accordance with generally recognised and accepted standards) would limit CPs ability to offer differentiates and innovative products.

7.248 However, as with other aspects of the key characteristics supporting VULA, we recognise that some restrictions may be necessary in order to protect network security and integrity. However the principle that should apply is that maximum control of CPE should be afforded to competing CPs, and not subject to undue restrictions by the access provider.

Pricing of VULA

7.249 In the Super-fast Broadband statement, we set out our view that, in the near term, there should be pricing flexibility on any non-physical NGA products. This may be in terms of the absolute level of prices, geographic variations, changes over time and may possibly allow for volume discounts and also tiered pricing. This approach was based on the view that, over the next few years, there would be a single market for all broadband speeds, including super-fast broadband, and that accordingly broadband services and competition based on CGA (copper and cable) networks would continue to be available.

7.250 We continue to consider that price regulation of new non-physical NGA products is likely to be disproportionate at this stage for the reasons set out above. Moreover, where demand is uncertain, forecasting costs and revenues is likely to be very difficult. Price regulation would also carry the risk of stifling investment if prices were set too low or alternatively reducing consumer benefit if prices were set too high. Pricing flexibility allows the investor to trial different prices, while relying on the constraints present in the market to protect the interests of consumers. This is likely to be particularly beneficial where demand is uncertain, allowing a market-led outcome rather than a regulation-led outcome.

7.251 However, any pricing approach adopted by BT would need to be fair and non-discriminatory. For example, it would need to be available to all and not designed to specifically favour BT's downstream businesses.

7.252 There are a number of pricing structures that BT could implement. For example, given the considerable uncertainty on how demand for NGA-based services will develop, BT may wish to trial different prices, perhaps over time or in different geographic areas in order to assess how purchasers of non-physical inputs and end consumers change their behaviour in response to different price levels.

7.253 Tiered pricing, where BT offers wholesale access at different prices based on different quality measures such as speeds, could result in higher consumer take-up of services, particularly where investment involves high fixed costs but the incremental cost of serving an extra customer or providing extra bandwidth is relatively low. In addition to the potential to increase consumer take-up, allowing different prices to be set and higher returns to be made on the highest quality products may also create efficient incentives to invest in NGA. Tiered pricing, by speed, may in any case be necessary in situations where there is a higher cost associated with providing higher speeds, to ensure efficient usage. However, we would be concerned if BT were to implement tiered pricing that allowed it to generate excessive profits and potentially limit the ability for retailers to offer innovative retail prices.

7.254 Whilst we consider that setting regulated prices for new non-physical NGA products in the near term would be disproportionate, we will closely monitor the outcome of any specific pricing approaches adopted if there is a risk of anti-competitive outcomes. If we were to see evidence of margin squeeze or pricing structures that might damage competition, this could cause us to review our overall approach to pricing flexibility. In any case, BT would continue to be subject to general competition law which would limit its ability to behave in a manner which is considered an abuse of its dominance in the market.

7.255 However, it is important to note that pricing flexibility would not give BT complete freedom in pricing NGA services. The risks are likely to be mitigated by the presence of constraints from current generation broadband and from competition from other operators. A further constraint might be the availability of upstream passive products, such as PIA and SLU. The availability of such products could mitigate the risk of anti-competitive outcomes by encouraging innovation in design and construction as well as product offers and pricing structures.

7.256 We envisage that the position that we take on the regulation of non-physical NGA products would remain in place for the period between market reviews. This would likely be extended beyond such a period in the event that the circumstances merited such an extension. However, it the underlying competitive conditions were to change

from the current forward view, we may need to revisit these principles and approaches.

7.257 Such changes could be driven by a number of developments. In some cases, inter-platform competition could increase in certain locations, resulting in more focus on lighter touch or deregulatory policies. Or we may see customer expectations and experiences of NGA result in the emergence of a new super-fast broadband market, distinct from today's broadband services. Alternatively, the development of NGA networks and the communications sector more generally could result in changes to the existing models of competition, for example through the removal of copper links between homes and exchanges as part of a transition from copper to fibre.

7.258 These developments may necessitate a change to the overall approach to pricing if they increase the risk of excessive pricing. For example, where the copper network is stripped out, it might be appropriate to introduce anchor product pricing. This would involve specifying one or more wholesale products, for which we would set the price. The anchor product would be similar to products widely available and demanded today and price could be set on the basis of existing products' prices. Prices of other, non-anchor products could be set by the asset owner, with the price of the anchor product acting as a constraint, ensuring that non-anchor product prices were not set excessively. Anchor product pricing has the advantage of creating incentives for efficient investment while ensuring that consumers of products currently available today are not adversely affected.

7.259 Finally, if the underlying competitive conditions were to change in a way that made it appropriate for us to set prices of VULA products, we would ensure that regulated prices reflect the risk incurred by BT at the time the investment was made.

7.260 We do not expect the underlying competitive conditions, and therefore our general approach to pricing, to change within this market review period. Nevertheless, we will continue to monitor changes in market conditions and be ready to change our approach if necessary.

Provision of VULA on a stand-alone basis

7.261 In order to meet the key characteristics of VULA, as set out above, we consider that BT must offer VULA on a stand-alone basis. That is to say that VULA should not be inextricably link, or bundled, with other products, such as a voice product. Whilst we would not want to prevent CPs from purchasing VULA alongside other products, we consider it important that CPs are able to choose whether or not to take any additional products. This ensures that VULA is a 'raw', service-agnostic, access product. This issue is discussed further below when comparing BT's product with the VULA requirements.

Interpretation of the no undue discrimination obligation for VULA

7.262 In Section 6 we discussed the general requirement for no undue discrimination, and also the possibility of having a complete prohibition of discrimination. In relation to BT's provision of VULA, we are proposing that the more strict interpretation of no undue discrimination (i.e., a complete prohibition) is adopted.

7.263 This proposed approach to no undue discrimination mirrors the EoI requirements set out in BT's Undertakings. That is, we are likely to find BT in breach of this SMP requirement if it were to provide VULA to its own downstream divisions without first making it available to OCPs on the same timescales, terms and conditions (including

price and service levels), by means of the same systems and processes and by providing the same information.

7.264 We consider that this approach to no undue discrimination is appropriate, as VULA is expected to be the main basis for competition in NGA-based services for the period covered by this review. We also consider that this approach is proportionate as VULA is a new product and, as such, there would be no need to re-engineer existing products.

7.265 We consider the application of the no undue discrimination to VULA in more detail from paragraph 8.49.

BT's GEA products and the proposed VULA characteristics

7.266 Over the past 18 months or so, BT (Openreach) has been developing a set of generic Ethernet access ('GEA') products based on its FTTC and FTTP NGA deployments. It now seems very likely that these GEA products would form the basis to any non-physical WLA remedy (VULA).

7.267 Given our proposals on the market definition, the key characteristics of VULA and our interpretation of the no-undue discrimination requirement in relation to VULA, it is appropriate to consider how BT's GEA products could fulfil the proposed VULA requirements.

Localness

7.268 It is our understanding that BT's GEA product, as provided by Openreach, extends between the end user premise and the local serving exchange. In the case of FTTC the local serving exchange is the site where FTTC deployments are aggregated. In the case of FTTP the local serving exchange is the site where the FTTP 'head end' equipment is accommodated. Further, FTTC and FTTP will share the same local serving exchanges. BT's current plan is to have about 800 to 1000 of these local serving exchanges. These proposed GEA arrangements would seem to be compatible with our VULA requirements.

Service agnostic

7.269 In the case of BT's FTTC-based GEA products the basic connectivity does appear to be service agnostic. However, there is potentially an issue in the way that BT is tying the availability of this product to other products/services, such as MPF or WLR. In order to meet the VULA requirements BT would need to make a stand-alone version of this product available. This, however, would not prevent BT from offering additional incremental services if it wished.

7.270 In the case of BT's FTTP-based GEA products, again the basic connectivity does appear to be service agnostic. However, there is a complication in that BT has chosen to embed an ATA into the NTE, which currently is a necessary part of the GEA product. Although, this voice ATA does not belong in this market, we are aware that there are good economic and commercial reasons for embedding it in this way. Therefore, to the extent that a voice ATA is inherently embedded into the GEA product we consider that access to this should be made available in accordance with the VULA requirements. In practice, this would mean that the voice ATA functionality should not extend beyond the local serving exchange and control over the voice ATA functions should be provided to the interconnecting CP. Discussion about this are currently ongoing within the industry and the arrangement where the voice ATA

functionality terminates at the local serving exchange and where control is provide is being referred to as ‘open’ ATA. It is our current view that open ATA would be an essential requirement if the voice ATA is embedded into the GEA/VULA product.

Un-contended

7.271 It is our understanding that BT’s GEA products, based on both FTTC and FTTP technology, are ostensibly un-contended. That is, there is sufficient capacity in the access network to ensure that the peak demands on end users can always be supported. If this is the case then the proposed GEA arrangements would seem to be compatible with our VULA requirements.

Control of access

7.272 In the case of BT’s FTTC-based GEA products, we understand that BT is currently offering three generic profiles, each with a different trade-off between line speed and line stability. In addition BT is applying dynamic line management to the connection. This would appear to offer the interconnecting CP with a reasonable level of control. However, should additional profiles or greater control be required by CPs we would expect BT to met reasonable requests.

7.273 BT’s FTTP-based GEA products are not as advanced as its FTTC-based GEA products and consequently there is less information available about control options associated with BT’s FTTP-based GEA products. However, as discussed above, as a general rule we would expect BT to meet reasonable requests for control options as this product develops.

Control of CPE

7.274 BTs current presentation of its GEA products is an Ethernet port on the NTE. Ethernet is a common and well understood standard and so it should be relatively straight forward to connect GEA to consumer premises equipment (CPE), such as computers, routers, TV decoders, etc. However, some CPs have raised concerns with BT’s current approach and there seems to be two specific issues, that both lead to the same conclusion.

7.275 Firstly, by having an Ethernet port on the NTE it means that the NTE needs to be locally powered (i.e., plugged into a power socket within the consumer premise). Some CPs have pointed out that if they provide a piece of CPE, e.g., router or TV decoder, then this would also need to be locally powered. They suggest that it would be simpler (for the consumer) and more efficient if the active (Ethernet) functionality of the NTE was included in the CPE. Thus, only one ‘box’ in the consumer premise would need to be locally powered. This has resulted in these CPs suggesting that the NTE should not contain any active electronics and should instead simply provide a passive connection to the wire or fibre – an arrangement commonly referred to as ‘wires-only’.

7.276 Secondly, as discussed above, in the case of its FTTP-based GEA products BT has chosen to embed an ATA into the NTE, Some CPs are concerned that BT will configure this voice ATA in a way that favours its own voice services. To avoid such a situation these CPs say that they would like to provide their own voice ATA. However, like BT they consider that there are good reasons to embed it into the NTE and the only way they can achieve this is by removing BT’s NTE. This again leads these CPs to suggesting that the NTE should not contain any active electronics and should instead simply provide a passive connection – fibre in the case of FTTP.

7.277 Our starting point here is to ensure that CPs are provided with sufficient control of the CPE. In this regard we consider that an Ethernet presentation goes a long way to achieving this. However, whether greater consumer benefits could be realised by moving the active electronics from the NTE and into the CPE remains an open question, the answer to which is likely to depend on a number of factors, such as operational issues and interface standardisation.

7.278 It is our current understanding that the standards are not sufficiently mature, for either FTTC (VDSL) or for FTTP (GPON), to enable a wires-only presentation to be readily implemented. This suggests that it would not be straight forward to adopt a wires-only interface for GEA today, whether it is based on FTTC or FTTP. In light of this, BT's proposed Ethernet presentation would seem to be a sensible option at present.

7.279 However, it is possible that things may change in the future making wires-only more viable. If this is the case then the situation can be reassessed.

7.280 In terms of the concerns over BT configuring the voice ATA, in the FTTP–based product, in a way that favours its own voice services, we have set out above our view that open ATA would be an essential requirement if the voice ATA is embedded into the GEA/VULA product. Further, given our proposed interpretation of no-undue discrimination, in this case, we would expect BT to make available, to OCPs, the same open ATA product that it uses itself.

Multi-port presentation of GEA

7.281 BT is developing its GEA services with a six-port master socket for use in customer premises. Two of the ports would be for voice services, and equipped with an ATA. The other four ports would provide basic Ethernet connectivity and would be designed for broadband and other data services. We understand that, as currently configured, the two voice ports could only be used by a single CP. However, BT has informed us that development work is underway to enable the two voice ports to be used by separate CPs. This would potentially allow the voice ports to be rented independently of one another, either by a single CP or by two CPs.

7.282 This multi-port model of GEA clearly has some potential benefits. In particular, in the case of a FTTP network it would enable a consumer who wants a second voice and/or data connection to be served more efficiently over a single fibre connection, rather than requiring the installation of a second fibre. In the case of a FTTC network it is less clear that such a model would be as beneficial, as initially voice will continue to be supplied over the baseband frequencies of the copper sub-loop and as such only a single connection can be supported on a single copper sub-loop. Further, the capacity to each end user is inherently more limited in a FTTC network, due to use of VDSL technology, and as such there is less scope to provide additional connections without installing additional copper sub-loops.

7.283 BT has argued that switching CP would be easier with a multi-port master socket, as it would not require an engineering visit to replace the master socket. This argument, however, seems to be predicated on the assumption that the alternative to a multi-port master socket is to have no master socket at all. In practice an arrangement where there is no master socket at the end user premise is unlikely to be a realistic option. On the more realistic assumption that a master socket of some form is present, BT's argument falls away, which then leads to the question of what form the master socket should take, e.g., how sophisticated should it be and should it have multiple ports?

7.284 Whilst we recognize that the multi-port model may have some benefits, we do have some concerns over how it might operate in practice. Firstly, we would be concerned if it were to involve any reduction in functionality available on an individual port. For example, if the maximum bandwidth on a data port were to be restricted in order to preserve capacity for a potential second port this would be a significant issue. It could mean that, in order to obtain the required bandwidth, the consumer would be forced to purchase a second connection. This would clearly be undesirable. BT has told us that the functionality of individual ports would not be restricted in this way, and that FTTP technology has potential for CPs and end users to upgrade to even greater bandwidths than today's 100Mb/s product over a single port if required. However, in the case of FTTC, the lack of any restriction would mean that the multi-port model would require the installation of a dedicated copper sub-loop for each CP requiring a separate active port, which would seem to substantially undermine the main benefit of the multi-port model.

7.285 Our second concern is that it is not yet clear how the pricing of the multi-port model would work. If the potential efficiency benefits of the model are to flow through to the consumer, the lower costs of provisioning additional connections should be reflected in lower prices, where consumers choose to purchase a second or subsequent connection. However, our understanding is that BT's current intention is that a second or subsequent GEA service would carry the same charge as the first. In these circumstances, it is not immediately apparent that any pricing benefits would flow through to the consumer in the short term. It is possible that, based on assumptions about the prospective demand for multiple connections and the efficiency savings obtained in provisioning second or subsequent connections, that the standard price of all connections may be reduced. In that event the efficiency benefits would be spread across all consumers, rather than accruing to those who actually want more than one connection. This approach, however, would not tend to encourage efficient usage of multiple connections. The overall point here is that, unless the charging structure allows the potential efficiency gains to flow through to consumers, those gains may simply accrue to BT in the form of higher profits, and that could be of potential concern in the future.

7.286 As discussed above, in a few years time a wires-only presentation of GEA may be technically feasible. However, to the extent that there has been significant take-up of separate ports by different CPs the multi-port model proposed by BT would be likely to make migration to such a presentation considerably more difficult.

7.287 We are aware that the views of the multi-port model vary significantly among CPs, with some in favour and some strongly against. Those in favour consider that it would promote effective competition in the retail market and be beneficial for consumers. Some of those who oppose the model argue that, in particular, it would not be well suited to the requirements of business customers. We would welcome further views on these issues from interested stakeholders, supported where possible by evidence.

7.288 In the light of these considerations, our preliminary view is that:

- BT should be able to proceed with the development and implementation of the multi-port Ethernet presentation model; but that

- In accordance with the proposed access obligation(s), BT should be prepared to meet reasonable requests for alternative forms of presentation where the technical standards support this.

Review of the ALA technical requirements

7.289 As stated above (paragraph 7.234), the ALA technical requirements that we have set out are relevant to applying remedies in this review. We remain of the view that these requirements are useful in helping industry develop a common set of standards for ALA.

7.290 We have built upon the framework set out in the ALA technical requirements in formulating the VULA remedy described above. However, as in any market review, the remedies applied must be focused on the problems identified in a given market. The scope of the WLA market therefore requires a narrower interpretation of the ALA requirements.

7.291 Some of the requirements set out in the ALA address broader issues than those relevant to this review, and therefore might be considered outside the scope of any remedy that might be applied.

7.292 For example, the security parameters set out in the ALA technical requirements would, in our view, be outside the scope of what might be included in a regulatory remedy to SMP in the WLA market. This is not to say that these requirements are not necessary, rather only that they are simple outside the scope of the current review.

Consultation questions

Question 6 In relation to LLU, do you agree with the assessment and options set out?

Question 7 In relation to fibre access, do you agree with the potential unbundling arrangements for the different fibre architectures and the positions/options set out given the current and expected future availability of fibre within BT's access network?

Question 8 In relation to SLU, do you agree with the assessment and options set out?

Question 9 In relation to PIA, do you agree with the proposed PIA obligation structure and the proposed implementation arrangements?

Question 10 In relation to VULA, do you agree that VULA may be a necessary access remedy in the WLA market and if so, do you agree with the key characteristics identified and how these currently relate to BT's GEA products?

Section 8

Proposals on specific access remedies

Introduction

8.1 In Section 7 we considered a number of potential specific access remedies on BT by considering them individually, both in terms of the case for requiring each of them, and in terms of their optimal design when assessed against the objectives of increased competition and investment.

8.2 We now move on to consider these potential specific access remedies in combination, and to assess the overall impact on stakeholders of our proposed combination of remedies. We consider that the potential remedies are best assessed together because our proposals on each remedy are linked logically to the approach taken on the others.

8.3 This section covers:

- Our proposals on the combination of these remedies that should apply to BT;
- Our proposals on the form of these remedies, including their pricing;
- The case for imposing specific access remedies on KCOM;
- The link to the BT Undertakings;
- The application of BT's no undue discrimination requirement;
- Our approach on WLA regulation in new build areas;
- Our proposed approach to those CPs offering WLA services based on using physical remedies as an input; and
- The relationship between access requirements based on SMP conditions and ones based on contractual obligations (e.g., where public subsidy may be involved).

Framework for considering specific access remedies on BT

8.4 Having identified and discussed each of the individual specific access remedies in Section 7, we now go on to consider the appropriate and proportionate combination of specific access remedies required to address the competition issues identified in our assessment of market power in Section 4. Addressing these competition issues is our primary objective when considering what combination of access remedies to propose for BT. This aim reflects our duty under section 3 of the Act, to further the interests of citizens on communications matters and the interests of consumers in relevant markets - where appropriate by promoting competition.

8.5 As well as addressing competition problems, a further relevant consideration is the extent to which the available remedies achieve our objective of securing efficient investment. Given current market circumstances, this primarily concerns promoting investment in NGA infrastructure. This objective relates to our duties under EC law

and the Act, which are summarised in Annex 5. Indeed, the revised EU framework implies that a greater weighting should be given to investment considerations when making decisions on regulatory remedies. Moreover, the UK Government's proposals in its Digital Economy Bill seek to give more prominence in our duties to the need to consider efficient investment in our regulatory decisions.

8.6 Of course, the competition and investment objectives are linked. This is because the WLA market, as defined in Section 3, covers both CGA and NGA networks. Investment in NGA infrastructure will therefore affect competition in the overall WLA market. In CGA, BT already has a network and so the best way for regulation to promote competition has proved to be for OCPs to access that network.

8.7 However, the prospect of NGA investment over the next few years offers an opportunity to maintain and potentially extend competition in the WLA market. The fact that BT has not yet deployed a NGA network and hence does not already have a ubiquitous legacy network provides an opportunity to ensure that the upcoming investments in new infrastructure are 'contestable'. This means that OCPs can be given an opportunity to deploy NGA networks before or at the same time as BT. This could have the effect of increasing competition in the long term as well as the short term, through OCPs owning more network elements and so having more control over costs and the potential for innovation.

8.8 Our decisions on the appropriate charging arrangements for WLA access remedies can also affect both competition and investment. For example, there is potential to disincentivise investment in NGA by an excessively rigid approach to pricing of some WLA services, especially in the initial stages of NGA deployment when costs and demand are less certain. While a parallel CGA network is still in place it is not necessary to have a rigid approach to pricing.

8.9 In making our proposals for WLA regulation during the important early stages of NGA deployment, a number of issues are relevant to meeting these two objectives of promoting competition and investment. We consider that WLA regulations should:

- Support competition across the full range of downstream services, for example, covering all broadband speeds. CPs should therefore have access to both CGA-based and NGA-based access products in the WLA market;

- Maintain effective competition (where it exists) in markets downstream of the WLA market. This means:

  - reproducing in an NGA world, the benefits that LLU has delivered in CGA. LLU has been very successful, with over 6.5 million unbundled local loops at February 2010. In the downstream WBA market, this has enabled a very significant degree of deregulation, covering about 72 per cent of the UK; and

  - ensuring that the right NGA remedies are introduced, early enough, to provide a suitable transition path over time for the range of competitors currently using CGA remedies;

- Lower barriers to entry, so that alternative CPs have opportunities to make their own investments in NGA. In doing so, we also consider that we should acknowledge the possibility of public funding to promote NGA investment, which could affect the impact of some potential WLA remedies;

- Take account of BT's specific plans for NGA deployment. This includes:

- BT's planned NGA architecture, which for its FTTP deployments is a GPON architecture. This affects which access remedies are technically feasible;

- The mix of NGA deployment scenarios. BT's current plan, to the end of 2012, is to make NGA available to 30 per cent of households using FTTC and to a further 10 per cent of households using FTTP. The remaining 60 per cent of households would not get NGA deployed by BT in that timeframe. This variety of scenarios, along with uncertainty about the order in which NGA roll-out will occur, suggests that a variety of WLA remedies may be needed to meet the competition and investment objectives that we set out;

- The possibility that BT will stop using its CGA network in some areas. In general, BT plans to deploy its NGA network as an 'overlay', keeping the existing copper network in use. In due course, BT may start to 'switch off' its CGA network, although our current understanding is that this would not begin during the four year forward look period covered in this review. When assessing individual remedies, we consider any potential implications of copper switch-off; and

- The situations in which BT deploys NGA in new build developments, i.e., where there is no existing CGA network. We support such developments, as they involve NGA investment. However, they do raise some distinct issues when considering WLA remedies.

- Reflect the high current uncertainty about how the market for NGA services will develop, and what will be the best initial and longer-term way of delivering NGA services. Given this uncertainty, we consider that it would be unwise to attempt to anticipate future demand. Rather, keeping options open that cater for changes over time may be preferable, for example in the mix of FTTC and FTTP deployments; and

- Take account of, and not inhibit, potential future models of competition in this market, for example ones that might flow from technical developments or significant unforeseen demand for NGA services.

8.10 As explained in Section 3, our definition of the relevant market includes physical and non-physical connectivity. When considering the combination of potential remedies in relation to BT's infrastructure, we consider first the scope for competition based on the most direct form of access to that infrastructure, taking into account our assessment of the individual remedies in Section 7. For CGA services this is unbundled access to BT's copper access network at the exchange. For NGA services it is unbundled access to BT's fibre network. After considering that remedy, we discuss the relative role of other physical remedies which involve more limited forms of access to BT's NGA infrastructure. We then assess a remedy that has similar characteristics to a physical remedy (from OCPs' perspective) but may produce better outcomes for competition and consumers.

LLU – a remedy for CGA services

8.11 During the four year forward look period taken by this market review, it is expected that the vast majority of services provided over BT's access network will be based on its existing copper network. Some of BT's NGA investment will be in 'new build' areas where customer premises do not currently exist. However, in general, BT's NGA network will be an overlay, i.e., it will be run alongside its CGA network rather than replacing it (at least for the foreseeable future). Therefore, whilst much of the

discussion on WLA access remedies involves NGA issues, it is important that regulation of CGA continues to be effective.

8.12 So far, LLU has been an effective specific access remedy, so much so that it has enabled a significant degree of deregulation in the downstream WBA market. Were we to remove the existing LLU remedy, this could lead to a need to re-impose some regulation in the WBA market. Keeping LLU as an effective remedy would enable CPs to continue to compete with BT, and is likely to lead to the greatest benefit for citizens and consumers. It would ensure that CPs are able to innovate and differentiate their products to the greatest extent technically and economically feasible, ensuring that we retain the existing benefits of LLU-based competition without limiting development of competition and investment in downstream markets.

8.13 Therefore, we propose that the LLU regulation should be maintained in the WLA market. Further, we propose that the current LLU obligation should remain in its current form (except for some minor clarificatory changes, as explained in Section 9).

8.14 We have therefore included a provision in our legal instrument in Annex 7 that would have the effect of continuing a 2008 SLG Direction for LLU (until otherwise modified or withdrawn)[97]. That Direction required BT to make amendments in relation to the SLGs that it offered for LLU. The SLGs include requirements for Openreach to pay compensation to OCPs proactively for LLU service failures. We consider that it is important for these SLG requirements to continue, as they give Openreach incentives to maintain a good quality LLU service.

Remedies for NGA services

8.15 As explained in paragraph 8.4, our primary objective when considering specific access remedies on BT, in relation to NGA, is to promote competition to address the concerns that we identified in our market analysis. In promoting competition, we are also mindful of our duties in relation to investment, as our proposals on NGA remedies have the potential to affect the level of investment in NGA networks over the coming years. We now discuss how we have considered these objectives in relation to potential remedies for NGA.

Fibre unbundling

8.16 As we move to NGA networks, it would be desirable to have an SMP remedy that replicates closely the competitive impact of LLU. The simplest parallel in NGA networks to having an unbundled copper loop would be to allow competing CPs to take over unbundled point-to-point fibres to the customer.

8.17 However, BT's chosen method of deploying a FTTP NGA network is a GPON architecture, not point-to-point fibre. As stated in Section 7, we do not consider fibre unbundling to be a realistic option on a GPON network.

8.18 In considering whether dark fibre might be a means for OCPs to compete, the reality is that in the UK – even in large metropolitan areas - there is very little dark fibre deployed in the access network. Dark fibre therefore does not represent a realistic option for competition at this point in time.

[97] *Service level guarantees: incentivising performance,* 20 March 2008, http://www.ofcom.org.uk/consult/condocs/slg/statement/statement.pdf

8.19 In the longer term, wavelength unbundling technologies may well support an effective access remedy for encouraging effective competition. However, the technological developments required to deliver such an SMP remedy are not expected to happen within the timeframe of this market review. However, we would expect to revisit the potential of this remedy in the next WLA market review. We anticipate that technologies may have developed such that this could become an effective remedy within the timescale considered by that future review.

8.20 A further alternative approach is that we could require BT to install multi-fibre when deploying its GPON access network. However, we consider that this is likely to have substantial cost implications for BT, which might undermine its investment case for NGA. A key consideration when assessing the proportionality of imposing such a requirement on BT will be the availability and effectiveness of alternative potential access remedies. To the extent that these alternatives achieve the over-arching objectives of securing competition and investment then it would not be appropriate for us to require the installation of multi-fibre as a remedy. As we set out below, we consider that there are indeed such alternative local access remedies available to secure our objectives.

8.21 We therefore propose that fibre unbundling is not a viable main tool for competition in the period covered by this review, and that there should be no related specific access requirement on BT. However, we note that OCPs would still be able to seek fibre access products, under BT's general access obligation to meet reasonable requests for network access (which we are proposing should continue).

A proposed complementary set of NGA access products

8.22 We consider that it is necessary to have specific access remedies to support competition and investment in NGA, as well as continuing the LLU remedy. This is because this would enable BT's competitors to compete effectively by providing a full range of CGA and NGA services in downstream markets. Also, we consider that having this range of NGA remedies available increases the prospects that OCPs would compete based on control of more elements in the value chain. Where BT does not deploy an NGA network, OCPs' ability to compete in the WLA market would continue to be limited by the extent of BT's NGA deployment, unless BT provides specific physical access products that lower barriers to entry into NGA provision for OCPs.

8.23 Further, we consider that if we did not introduce NGA remedies at this point in time, there would be a detrimental impact on competition and consumers during the process of transition from CGA-based to more NGA-based competition in this market. In the absence of NGA remedies in this period, we consider that BT would have an enhanced competitive advantage.

8.24 We propose that BT should provide the following NGA-related specific access products in the WLA market:

- Virtual unbundled local access (VULA): where BT upgrades its network (using either FTTC or FTTP technology), it should supply a product that meets certain key characteristics specified by us. These characteristics (see paragraphs 7.231-7.248) require BT to offer a simple, virtual product that offers very similar control and innovation benefits to BT's competitors as the physical LLU product;

- Sub-loop unbundling (SLU): BT should continue to offer the current SLU arrangement, whereby a CP provides a stand-alone cabinet. We also consider

that BT should allow sharing of its own cabinets (where possible and reasonable), which we consider is covered by the existing SLU obligation; and

- Physical infrastructure access (PIA - including ducts and poles): BT should meet reasonable requests for access; provide information on available capacity; and deliver a RO to a scope and timeframe specified by us. Our detailed proposals on the form of the PIA remedy are set out in paragraphs 7.145-7.186.

8.25 One of our reasons for proposing this mix of NGA remedies is that a variety of NGA deployment scenarios will exist in different geographic areas, including during the next four year period over which we are considering market developments in this review:

- Under BT's current plans, it will deploy NGA architecture covering 40 per cent of UK premises by the end of 2012, based either on FTTC (30 per cent premises) or FTTP (10 per cent premises) technology. Where BT deploys NGA, it will be technically feasible to offer a VULA service to OCPs; and

- In areas where BT has not yet deployed NGA, VULA would not be an option to support competition. However, the availability of SLU and PIA would support competition and NGA investment in these areas as well as in the areas where BT deploys its own NGA network and offers VULA. Of course, different access products are likely to suit different geographies, based on various factors including demographics, BT's network architecture and the networks of those OCPs wanting to use elements of BT's access network to deliver NGA services.

8.26 At this point, we consider VULA to be the primary focus of NGA competition, to supplement the continuing effective LLU remedy over at least the next four years. This product should support innovation much in the same way as the current LLU product. Also, by using VULA, OCPs would be able to start providing NGA services at lower risk, as they would not have to invest in their own infrastructure and as such would not have to incur as significant sunk costs or overcome as significant economies of scale. By using VULA as the basis to compete in the initial phase of NGA roll-out, OCPs also would be able to build their customer base in the supply of NGA services, and thus to provide a stronger basis for investing in physical remedies in future. It is also the case that our economic analysis (see Annexes 9 and 10) suggests that VULA is likely to generate relatively low static costs of competition compared to other potential remedies and as such it is likely to be the most effective of the available potential remedies in supporting wide scale competition in downstream markets. Therefore, we propose that the VULA should be available wherever BT deploys its NGA network.

8.27 Whilst VULA currently compares favourably with other remedies on the basis of static costs, that is not the only basis on which to consider our approach to remedies. We also need to consider the potential dynamic benefits available from giving OCPs more control over how to compete. Moreover, where BT has not yet deployed NGA, VULA would not exist as an option for promoting competition. The exact geographic plan of BT's NGA deployment is not clear. We have therefore considered the case for having one or more physical remedies on BT to supplement VULA.

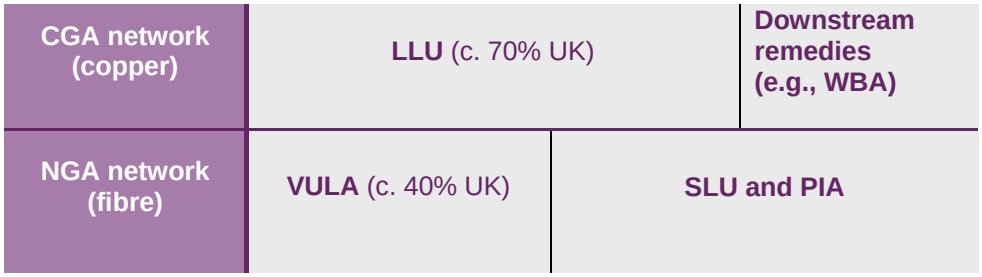
8.28 Physical remedies could increase competition in the WLA market by lowering barriers to deployment of additional infrastructure by OCPs, which can be used to compete with BT's CGA network. At the same time, physical remedies can thereby also support investment in NGA networks. This is consistent with the Commission's draft

NGA Recommendation, which favours giving an opportunity for these remedies to work.

8.29 When considering which physical remedy is most appropriate, our key observation is that the best solution for competition and investment is likely to vary, between different geographies and between OCPs. In some cases, the economics of NGA deployment and the strategic position of an OCP could suggest that deployment using FTTC is preferable. In that case, SLU would be the appropriate SMP remedy to use, such as in an area with a large cabinet and a relatively dense market for NGA services. In other cases, access to ducts and poles might be more suitable, for example where there is usable spare capacity in the local duct network.

8.30 Figure 8.1 illustrates how the proposed remedies would fit together to deliver the benefits of competition to consumers for CGA and NGA networks in different parts of the country.

Figure 8.1 Primary remedies in different locations



8.31 A further argument for allowing alternative forms of access remedies is that there are a number of uncertainties that are likely to affect the optimal choice. Firstly, the future demand profile for NGA services is uncertain, and so the best way to compete is not clear. There is also potential for changes in technology (as occurred with LLU), particularly in the early years of NGA, that could change the relative economics of different ways to compete. Also, the timing of the transition to NGA is unclear, so having a choice of access products provides more ways to maintain competition during that transition.

8.32 In our discussions with CPs in this market review, there have been some expressions of potential interest in using physical access remedies. Whilst BT has been required to provide SLU since January 2001, there has been little interest in it until quite recently. There have also been some expressions of interest in using PIA for NGA network deployment. It is difficult to quantify the likelihood of this interest leading to firm demand for BT products. However, there is increasing interest in NGA deployments, and a prospect of central and local funding to promote those deployments. The prospect of such subsidies may also have increased, as there has been an apparent relaxation of the Commission's rules on State Aid[98].

8.33 We therefore consider that a 'mixed economy' of access products should be available to allow for variations in the relevance of each product, and for various market uncertainties in the near future. Indeed, we consider that BT's own NGA deployment plans support this mixed approach, as it is using both FTTP and FTTC in

[98] See http://europa.eu/rapid/pressReleasesAction.do?reference=MEMO/10/31&format=HTML&aged=0&language=EN&guiLanguage=en

the initial deployments to 2012. In turn, having this range of SMP remedies should promote better outcomes for consumers in terms of the price and availability of retail services.

8.34 We consider this mix of remedies to be proportionate partly because they are likely to be complementary, with some being suitable in some areas and others in other locations. Also, we consider that our overall approach is proportionate because we are, in our view, proposing relatively limited obligations on BT in relation to the physical remedies, in advance of clear expressions of demand and given the uncertainty about the feasibility of those physical remedies. This approach is consistent with the ERG's Common Position on Remedies[99], whose third principle suggests that uncertainty about the feasibility of a remedy should be reflected in how vigorously the remedy is pursued. That ERG Common Position also proposes that NRAs should not second-guess the market place, but rather should '*provide a coherent background against which market developments take place*' (p 60). We consider that our approach to duct, pole and SLU access is consistent with this principle, as we have focused on getting the physical remedies to the position where OCPs have sufficient information about whether to use them.

Proposed form of the specific access remedies

8.35 As discussed in Section 7, BT (Openreach) has been developing a set of GEA products based on its FTTC and FTTP NGA deployments and it now seems very likely that these GEA products would form the basis to any non-physical WLA remedy (VULA). As also noted in Section 7, BT's current GEA products are close to meeting the identified key characteristics for VULA.

8.36 We consider that BT should make available to OCPs enough information so that they can fully evaluate the suitability of using SLU or PIA to support their own NGA network deployments. We therefore propose to introduce an obligation on BT to offer PIA and to develop a RO on PIA. This would supplement the RO that already exists for SLU.

8.37 We are proposing that the first draft of the PIA RO should be made available within three months of our final decision. Subsequent progress does depend on the involvement of OCPs to develop the details of the product. However, we are conscious that BT has already expressed an intention to provide access to its infrastructure. We therefore consider that both BT and OCPs might reasonably be expected to start considering the contents of a PIA RO before we conclude on the formal obligation (which is likely to be in later summer). We have made proposals for timescales to develop a RO that assume that no work has been done to consider its content before any formal obligation is applied. However, we may amend these proposals and bring forward these timescales if there is progress in the period before we publish our final decisions.

8.38 At this stage, in the absence of firm demand to use the physical remedies, we do not propose that BT should be required to have industrialised operational processes, for example for handling large volumes of orders from OCPs. However, we would look for BT to develop such capabilities as and when such demand arises.

[99] Revised ERG Common Position on the approach to Appropriate remedies in the ECNS regulatory framework, ERG (06) 33, May 2006, http://erg.eu.int/doc/meeting/erg_06_33_remedies_common_position_june_06.pdf

Pricing approaches

8.39 In addition to our above proposals on the availability of a combination of remedies, we are proposing approaches to pricing that we consider are complementary and supportive of our competition and investment objectives. These potential approaches were discussed in the individual remedies in Section 7.

8.40 For LLU, prices are currently subject to charge controls that run until the end of March 2011. We consider that it remains appropriate to have a charge control on LLU, because in the absence of that charge control BT would have an incentive to raise the prices above the competitive level.

8.41 For VULA, we consider that BT should have the flexibility to set prices. We consider that this promotes investment by BT as it enables it to trial different pricing arrangements in the early, uncertain period of NGA services. However, we do not consider that this would damage competition, for two reasons. Firstly, BT is required to not unduly discriminate in the supply of VULA and as such cannot favour its own downstream divisions. Secondly, the prices charged by BT for VULA would be largely constrained from competition at the retail level by OCPs' continuing ability to purchase CGA services from BT on regulated terms and by the services offered by Virgin Media over its cable network. An attempt by BT to set excessively high prices would limit its ability to attract traffic to its NGA network, and thereby to recoup its NGA investment. Indeed, incentivising BT's investment in NGA deployment also has the potential to support competition, as it would also deliver greater availability of VULA, which offers the most likely means at present of competing in the provision of NGA service.

8.42 For the proposed physical remedies to support NGA deployment – both SLU and PIA – we propose to require BT to price them at their long-run incremental cost (LRIC), allowing a mark up for common cost recovery. We do not consider that the kind of pricing flexibility provided for VULA should apply to these products, because generally in the case of these physical products there are no risky additional investments entailed in there provision. However, where greater risk is involved, e.g., where BT invests in new duct or cabinets to deliver an NGA network, we consider that the LRIC-based prices charged by BT could be higher to reflect this greater risk. The proposed SMP condition on PIA allows for an 'appropriate' risk premium to be reflected in BT's charges. That proposed condition would cover both old and new duct and pole infrastructure, although the definition of 'appropriate' would differ between them.

Summary of impacts on stakeholders

8.43 We consider that the overall proposed set of general and specific access remedies on BT is the best option for promoting competition, and also supporting investment in NGA infrastructure. Notably, we consider that the mix of specific access remedies, and their proposed form, would best maintain current levels of competition in downstream markets, and enable competition across the full range of downstream services as NGA services become increasingly important.

8.44 We consider that our proposed remedies would lower barriers to entry for OCPs, so that they can choose whether and how to invest in CGA and NGA service provision. Notably, we consider that our proposals for a mix of specific NGA remedies would allow different geographic circumstances to be taken into account that would affect the viability of each proposed remedy. We also consider that this mix of specific

access remedies supports market entry by not closing off options in terms of what might prove to be an effective remedy.

8.45 We consider that the proposed requirements are appropriate and proportionate to place on BT. BT would be required to develop and maintain products and processes upon demand and to enter into contractual relationships with OCPs. These requirements could, therefore, divert BT's resources away from its planned and prefer commercial activities. However, BT would be financially compensated when it provides access products, due to the pricing approaches that we have proposed. Thus, once the demands for any access product is understood BT would be able to properly resource it, such that it would not adversely affect its other commercial activities.

8.46 In terms of the impact on consumers, we consider that the competition supported in downstream markets would benefit consumers, by providing an increased choice of provider, a wider range of products with improved quality of service and better value for money. We also consider that the mix of specific access remedies that we have proposed would benefit consumers because OCPs's use of SLU or PIA should promote wider geographic competition in, and availability of, NGA services.

Specific remedies on KCOM

8.47 KCOM is not currently subject to any specific product obligations. We considered imposing LLU on KCOM in the 2004 WLA market review, but did not consider that to be reasonable or proportionate. This was because there was no evidence of demand for KCOM to provide LLU services. However, as set out in Section 6, KCOM does have a number of general access requirements. These requirements include: providing network access on reasonable request; not discriminating unduly and publishing a RO.

8.48 A key issue in considering specific remedies on KCOM is that we consider it quite unlikely that OCPs will enter the market in Hull to make use of specific access products that we could mandate. We base this view on the very limited historic demand from competitors to access the Hull market, or indeed to compete further downstream, at the retail level. At this time, our discussions with CPs do not suggest that this unwillingness to compete with KCOM is about to change materially in the early stages of NGA deployment.

8.49 At this time, we propose to continue with the approach of not requiring KCOM to develop specific remedies. This is mainly because of the lack of clear evidence of demand for such access products from KCOM. Also, were demand to materialise in the Hull Area it is not clear that the demanded products would be the same as in other parts of the UK, given the different demographics. We therefore consider that it would be unwise to impose such remedies in the same form as those on BT. Taking all these factors into account, we consider that imposing no specific access remedies on KCOM is the appropriate and proportionate approach.

8.50 However, we have recently observed a greater general level of interest from a range of OCPs in offering services in the Hull Area. We therefore have proposed a new network access requirement for KCOM. We consider that it is justified to require KCOM to create an SOR process, which may assist the development of new network access in the Hull Area. We discuss this in paragraphs 6.16 to 6.27.

8.51 However, even if such access remedies not be demanded, it appears that consumers in the Hull Area are receiving offers (in terms of pricing and functionality) that are

generally in line with the rest of the UK. We have considered this issue further in the WBA consultation document.

8.52 In terms of assessing the impact on different stakeholders in the Hull Area, we therefore consider that our approach to be appropriate and proportionate. We are seeking to promote market entry into the Hull Area, but acknowledging the limited prospects of such entry. Until such time as demand materialises, we consider that we are not placing disproportionate obligations on KCOM. Also, we consider that our approach is consistent with consumers' interests. This is because we are providing opportunities for competition, but not proposing disproportionate obligations on KCOM, whose costs might be passed on to consumers with no corresponding competition benefits.

Other issues

Link to BT Undertakings

8.53 The BT Undertakings are a set of obligations on BT that are designed to deliver Equality of Access between BT and its competitors. Equality of Access is broadly based on two fundamental concepts: Equivalence of Inputs (EoI) and operational separation. On EoI, the Undertakings state that:

> *'Equivalence of Inputs' or 'EOI' means that BT provides, in respect of a particular product or service, the same product or service to all Communications Providers (including BT) on the same timescales, terms and conditions (including price and service levels) by means of the same systems and processes, and includes the provision to all Communications Providers (including BT) of the same Commercial Information about such products, services, systems and processes. In particular, it includes the use by BT of such systems and processes in the same way as other Communications Providers and with the same degree of reliability and performance as experienced by other Communications Providers.*

8.54 We have issued a variation relating to the terms of BT's roll-out for FTTC ("the FTTC variation")[100] and a variation for BT's roll-out of FTTP-based services ("the FTTP variation")[101]. The FTTC variation allows BT's Openreach division to control and operate electronic equipment necessary to provide super-fast broadband services using FTTC. The FTTP variation does the same for the provision of super-fast broadband services using FTTP. The objectives of these variations are to deliver benefits to consumers by supporting early investment in super-fast broadband and, where appropriate, by promoting competition.

8.55 In addition, the FTTC and FTTP variations commit BT to provide fit-for-purpose FTTP and FTTC non-physical wholesale products, and BT is required to provide FTTP and FTTC non-physical wholesale products to itself on an EOI basis. The FTTC variation also required that BT shall conduct a consultation with industry in order to assess the demand for and CPs' views on the design of FTTC non-physical inputs[102].

8.56 These variations recognise that a balance must be made between the incentives of CPs to invest in these technologies with the requirement for continued effective and

[100] http://www.ofcom.org.uk/consult/condocs/fttc/statement/
[101] See http://www.ofcom.org.uk/telecoms/btundertakings/exemptionsandvariations/fttp.pdf
[102] SLU is an FTTC physical input. BT must complete this consultation within three months of such time as end users in one million premises are taking services based on a BT non-physical FTTC Product, or at the latest during the course of 2011.

sustainable competition. We have sought to encourage investment in NGA while ensuring fit-for-purpose non-physical products are made available as a means for CPs to compete effectively with BT.

8.57 The suite of WLA remedies we are proposing are consistent with the requirements and objectives of the Undertakings, FTTC variation, and proposed FTTC variation. The remedies balance encouraging investment in super fast broadband while ensuring that CPs have access to sufficiently flexible non-physical products to allow them to compete, with the benefits eventually being passed on to end users. Furthermore, we have only proposed remedies which are likely to result in effective and sustainable competition by CPs.

Application of BT's no undue discrimination requirement

8.58 As discussed in Section 6, we propose that BT should be subject to a no undue discrimination requirement in relation to the supply of services which fall within the WLA market. Further, in paragraphs 7.262-7.264 we propose how the no undue discrimination requirement should apply in relation to VULA.

8.59 Below we consider how the no undue discrimination requirements should apply in relation to the current products and the relationship between them, which are being considered by industry.

8.60 There are two broad issues here. The first concerns the relationship between upstream physical remedies and the GEA product we anticipate that BT will supply to meet the proposed VULA requirement. The second concerns the relationship between GEA/VULA and BT's downstream services.

Relationship between upstream physical remedies and the GEA product

8.61 Our provisional view is that BT's GEA service should not be required to consume upstream physical products – notably PIA and SLU products – on an EOI basis. This position is consistent with the stance we have previously taken in the Super-fast Broadband statement[103] and the FTTC variation.

8.62 We reported in the Super-fast Broadband statement that the economic and practical advantages of non-physical products and the uncertainty over the economic viability of physical alternatives have led the industry to express strong interest in non-physical products, while there had been no firm expressions of interest in investment based on physical inputs.

8.63 Subsequently, in the statement on the FTTC variation, we concluded that, in the absence of serious interest in physical inputs for super-fast broadband, imposing an EOI requirement would risk creating an unnecessarily complex and costly operating model for Openreach without delivering effective and sustainable competition based on physical inputs. We therefore concluded that requiring Openreach to provide physical inputs on the basis of EoI would not be proportionate.

8.64 We nevertheless set out that, in providing any physical FTTC products, BT should use the same components, processes and systems as it uses itself for the purposes of its active FTTC product where reasonably practicable and on a cost-efficient basis. BT's commitment to do this was set out in paragraph 5.57 of the FTTC variation.

[103] See http://www.ofcom.org.uk/consult/condocs/nga_future_broadband/statement/statement.pdf

8.65 We consider that a similar expectation should apply generally when interpreting the no undue discrimination requirement and its application to physical WLA products, such as PIA and SLU.

Relationship between GEA/VULA and downstream services

8.66 As an Openreach access product, GEA will be subject to the EOI requirements set out in the BT Undertakings. Those requirements will ensure that, when a downstream BT business uses GEA, it will do so using the same systems, process and procedures as are used by external customers.

8.67 We propose in Section 7, in the case of VULA, to apply a relatively strict interpretation of the no undue discrimination requirement, which mirrors the EOI requirements set out in the Undertakings. It is important to clarify how this approach would be applied in practice, particularly in relation to downstream voice services.

8.68 As discussed in Section 7, BT has chosen to embed a voice ATA into the NTE used to provide its FTTP-based GEA products. To meet the requirement to be service agnostic and to maximise the scope for innovation by purchasing CPs, the functionality provided by this voice component of the service should be as limited as possible. As discussed in Section 7, in our view, an open ATA functionality, which allows OCPs to use their own voice servers, should achieve this objective.

8.69 It is important then to consider how BT will provide retail voice services in an NGA FTTP environment. One option would be for BT's retail arm to use the GEA/VULA product, incorporating Open ATA, directly. In that case, the EOI obligations would clearly apply. BT has recently indicated that it is considering this option, and we welcome that development.

8.70 An alternative option would be for BT's retail arm to consume a voice product which is downstream of GEA/open ATA and which includes the functionality provided by the voice server. Openreach has been developing such a product, known as VoNGA (Voice over NGA). If this option were to be pursued, the question would arise as to whether the downstream VoNGA product should consume the upstream GEA/open ATA product on an EOI basis, or not.

8.71 Our provisional view of this issue is that, if BT's retail operations purchase VoNGA, then VoNGA should consume GEA/open ATA on an EOI basis. In reaching this view, we have taken account of the fact that a number of BT's main competitors are likely to purchase GEA/open ATA in order to compete in the downstream voice market, and that an EOI requirement is therefore likely to be the most effective way of ensuring that they are able to do so on truly equivalent terms.

8.72 BT considers that a requirement for VoNGA to consume GEA/open ATA would result in considerable system development costs. In assessing any development costs we would note that it is not the development cost for a particular system which is important but rather it is the difference in total development costs of the alternative options. In this case there seems to be two basic options:

- Option 1: BT builds systems to support the provision of GEA/open ATA to OCPs and separately builds systems to support the provision of VoNGA to itself; or

- Option 2: BT builds systems to support the provision of GEA/open ATA to OCPs and itself and then builds the additional systems that take GEA/open ATA and produce VoNGA.

8.73 Whilst BT has provided some indicative estimates of the costs associated with building the systems to enable VoNGA to consume GEA/open ATA, these cost estimates are broad and high-level in nature. Further, BT has not yet provided an estimate of the difference in total development costs. We are therefore not convinced at this point that such costs would justify a relaxation of the EOI requirement on this critical product. We would however, welcome stakeholder views on this important issue.

8.74 If BT's retail business were to use GEA/open ATA it is likely that BT would still be required to produce a downstream wholesale voice product such as VONGA in order to meet the SMP obligations imposed on it in the wholesale narrowband exchange line market review[104]. In these circumstances, however, the case for requiring VoNGA to consume GEA/open ATA on an EOI basis would be weaker, as it would not be required for true equivalence. There is a risk that in those circumstances, an EOI requirement might result in an additional cost, without providing any assurance of a level playing field for the CPs purchasing VoNGA.

8.75 Our provisional view is that VONGA should only be required to consume GEA/open ATA on an EOI basis if it is used by BT's downstream retail business. If BT's retail business does not purchase VoNGA, either at all or in significant quantities, our current inclination would be to relax the EOI requirement. We would welcome stakeholder views on this matter.

Approach to new build fibre deployments

8.76 In our September 2008 statement on the regulation of new build NGA deployments ("the New Build Statement")[105] we set out our approach to a number of issues arising from fibre network deployments in new housing developments. Our aim was to provide operators and developers with clarity on the regulatory environment for those developments in which fibre rather than copper networks are deployed at the outset.

8.77 We concluded that both non-physical and physical products might have a role to play in ensuring that consumers benefit from a choice of suppliers for communications services. In particular we set out the following expectations:

- In a new build environment, if it is apparent that only one telecommunications access network is viable then we would expect the operator of that network to provide access to it on a fair, reasonable and non-discriminatory basis through fit-for-purpose wholesale products;
- We would encourage operators to use open standards when developing wholesale access products and to agree the implementation with prospective wholesale customers;
- We would expect new build developers to install spare duct capacity and use sub-ducting, the adoption of which should ensure that the capacity of the installed duct would be sufficient to support duct sharing in the future, should that prove necessary for effective competition; and
- In addition, we would expect operators to consider the provision of an Active Line Access (ALA)-based product, which is capable of supporting effective competition

[104] http://www.ofcom.org.uk/consult/condocs/wnmr_statement_consultation/statement/statement.pdf
[105] *Next Generation New Build: Delivering super-fast broadband in new build housing developments* http://www.ofcom.org.uk/consult/condocs/newbuild/statement/

between service providers. The characteristics of such a product are discussed further in the next section, and in more detail in the consultation document that preceded our Super-fast Broadband statement.

8.78 It needs to be recognised that these are expectations and not formal requirements.

8.79 However, where the new build operator has been found to have SMP in the relevant market, in this case BT and KCOM, then any existing regulatory obligations will continue to apply, but where relevant it will be up to the SMP holder to determine how best to implement products which meet these obligation in agreement with perspective wholesale customers.

8.80 Where the new build operator has not been found to have SMP, then we would expect the operator of the new build network to provide access to it on a fair, reasonable and non-discriminatory basis through fit-for-purpose wholesale products. However, should this prove ineffective in particular cases, we would be prepared to undertake the relevant market reviews, and to impose appropriate formal SMP obligations where relevant, in the event of an SMP finding.

8.81 Our primary aim, in new build developments, is to ensure that suitable wholesale access is provided in order to support effective downstream competition. In the New Build Statement, as in this consultation document, we identified two general types of wholesale access: physical (e.g., duct access) and non-physical (active access).

8.82 Given our findings in this market review, that a non-physical access product (e.g., VULA) is likely to be the most cost-effective remedy to support competition, we consider that a new build operator should put more emphasis on ensuring that a fit-for-purpose non-physical product is available at the earliest possible opportunity.

Approach to CPs using physical remedies

8.83 Where OCPs decide to use BT's SLU or PIA from BT, they would be in control of a greater proportion of the supply chain in those locations. In these circumstances, it is more relevant to consider whether they should also be subject to regulatory remedies.

8.84 We would expect that in most cases, these physical remedies would be used to deploy NGA infrastructure, thereby competing with BT's existing CGA network in the same geographic area. Initially, such entrant CPs would not have a dominant position because – before the new deployment – the entrant CP would not have any market share of the WLA market.

8.85 However, were an OCP to take a significant share of the market over time in isolated geographic areas, we could consider the case for regulating such an OCP. One of our considerations would be the proportionality of regulating OCPs in very small, sub-national markets. We would also consider the timing of such an assessment, which might well take place as part of our next full WLA market review, in order to assess the degree to which there was a sustained impact from such market entry. Also, we would consider whether the new entrant CP had met reasonable demands for access to its network. We would expect such access to be provided in a way that is broadly in line with the VULA requirements that we have proposed for BT.

Remedies and public funding

8.86 The strategic importance of NGA means that various investments may be made with the support of public sector finance, whether on a national or a more local scale. It is therefore worth clarifying the link between our proposed remedies and any contractual requirements for network access that are imposed in public sector contracts for NGA provision.

8.87 The CPs that might receive public funding can be divided into two types:

- those with SMP status - whom we propose (in Section 4) are BT and KCOM; and
- those without SMP status - either building their own wholly new network, or partially using another network (such as that of a CP with SMP in this market).

8.88 Those operators with SMP status in the WLA market have to comply in full with their SMP conditions, regardless of the funding arrangements for developing and delivering a service. The SMP obligations, in effect, represent a minimum set of requirements on the terms of access to their network that such CPs need to grant. There is no flexibility to interpret these SMP obligations differently between different locations and funding arrangements.

8.89 Public bodies may wish to include in their contracts with CPs some requirements for more open access to NGA networks than would be required by SMP conditions. From our perspective, that is a matter between the public bodies and the CPs concerned. Our SMP obligations are framed in a way that they do not constrain public bodies from requiring *more* open terms of access than we might require through the relevant SMP condition. Our concern is strictly about compliance with the obligations that we have judged to be appropriate and proportionate for addressing SMP.

8.90 Where CPs are providing NGA access but do not currently have SMP, there is a prospect that such CPs would be designated in the future as having SMP status. Similarly, we could in future extend the requirements on existing SMP providers. Any such changes could be imposed in a future Ofcom market review (subject, of course, to consultation). This raises the prospect that contracts between public bodies and CPs would not include the minimum SMP requirements that we decide in future are required. In deciding on SMP remedies, we are required legally to impose what we consider to be appropriate to address that SMP, regardless of existing contractual arrangements. We therefore advise parties to such contracts to ensure that they include appropriate variation clauses to accommodate potential future SMP conditions.

8.91 We cannot prejudge in advance the type of access conditions that may be imposed on currently unregulated CPs. However, as an indication we suggest that CPs and public bodies that may be party to such contracts should review the access conditions that we are proposing for BT and KCOM in this market review and consider the potential changes in technology discussed in this section.

8.92 In terms of enforcing access obligations on funded CPs, we would consider enforcement action for any breaches of SMP conditions that we impose. It is not, however, our role to monitor, or take enforcement action in relation to, CPs' contracts with public providers, regardless of whether or not the CP in question has SMP.

8.93 We note that the Commission produces Guidelines on the criteria required for approval of State Aid. When these Guidelines were recently updated, reference was added to NGA investment. The application of the State Aid rules has since appeared to be relaxed, to promote NGA investment[106]. However, the Commission appears to suggest that approval for State Aid should be granted only if a requirement for fibre access is a contractual requirement on the CP concerned. In our assessment of SMP remedies, we explained why we are not currently proposing fibre access as a specific SMP remedy in this market. Our assessment for the purpose of applying SMP remedies is, however, without prejudice to any additional conditions covered by State Aid requirements. It would be up to the potential parties to the contract to make a case to the Commission that the mix and nature of the access remedies available is sufficient to warrant approval on State Aid grounds.

Summary of proposals on remedies

8.94 The overall approach that we propose on the specific access remedies, to supplement the general access remedies covered in Section 6, is as follows.

Remedies on BT

8.95 We propose that the following specific remedies should apply to BT:

- existing remedies to be retained:
  - requirement to provide Local Loop Unbundling (LLU);
  - requirement to provide Sub Loop Unbundling (SLU);
- new remedies to be applied:
  - requirement to provide Virtual Unbundled Local Access (VULA); and
  - requirement to provide Physical Infrastructure Access (PIA).

Remedies on KCOM

8.96 We are not proposing that any specific remedies should apply to KCOM mainly because we consider that there is not clear evidence of demand from OCPs for such access products from KCOM. Also, it is not clear that should demand materialise that exactly the same products would be required. Taking these factors into account we consider that not imposing specific access remedies is the appropriate and proportionate approach. However, as discussed in section 6 we are proposing that KCOM should be subject to a requirement to provide network access on request and also to develop an SOR process for new network access. Both of these requirements are designed to enable OCPs to request network access from KCOM.

Regulation of other CPs

8.97 In this market review, we may only apply SMP remedies to providers found to have SMP in the WLA market. We are proposing that only BT and KCOM have SMP in this market and therefore we are not proposing any specific remedies for OCPs.

[106] See See http://europa.eu/rapid/pressReleasesAction.do?reference=MEMO/10/31&format=HTML&aged=0&language=EN&guiLanguage=en

8.98 However, our ‘New Build’ guidance for developers and CPs deploying access networks to new housing developments continues to apply.

Consultation questions

Question 11 Do you agree with the framework for considering specific access remedies on BT?

Question 12 Do you agree that there is a need to have a complementary set of access remedies and if so, do you agree with the proposed set of remedies on BT?

Question 13 Do you agree that no specific access remedies should be imposed on KCOM in the WLA market at this time? Could any remedies on KCOM at the WLA market level address the competition issues that we have identified?

Section 9

Legal tests for specific remedies

Introduction

9.1 We discuss the need for imposing specific access remedies on BT in Sections 7 and 8, including the reasons why it would be proportionate to impose them. This section summarises why we consider that each proposed individual specific access remedy meets the relevant legal tests specified in the Act. This summary should, however, be read in conjunction with Sections 6 to 8.

9.2 We refer in Section 6 to the legal tests in section 88 of the Act in relation to the pricing obligations we propose for these specific access remedies.

Local Loop Unbundling Services (LLU)

Aim and effect of regulation

9.3 As discussed in previous sections, LLU services enable OCPs to rent wholly or partly local copper access network connections from BT, so that they can provide voice and/or data services directly to end users using their own equipment which is housed in BT exchanges.

9.4 LLU therefore allows OCPs to compete effectively with BT for the provision of current generation end user services without having to replicate BT's entire access network and it also gives OCPs flexibility to innovate and differentiate their services from those provided by BT.

9.5 So far LLU has been a highly effective remedy with a take-up of approximately 6.4 million lines in February 2010. It has enabled a significant degree of de-regulation in the downstream WBA market. Consumers have benefited from the innovation and from lower prices and have increasingly adopted broadband services.

9.6 Accordingly, having considered the options discussed in Section 7, we are proposing to maintain the obligation on BT to specifically provide LLU services on fair and reasonable terms, conditions and charges to all OCPs who reasonably request in writing such services.

9.7 We consider it appropriate to make some changes, when compared to current LLU obligations under SMP condition FA9. In particular, the LLU services concept under that condition includes, in addition to the main requirement on BT to provide access to MPF, a number of specified ancillary facilities/services including to provide SLU, together with a requirement to provide such ancillary services as may be reasonably necessary for the use of those things.

9.8 To provide further clarity and certainty, we propose to separate into distinct SMP conditions the obligations on BT to provide network access to MPF or to the non-voice band frequency of MPF (known as 'Shared Access'), on the one hand (i.e., LLU services, now condition FAA9), and access to MPF or Shared Access at an intermediate point prior to the main distribution frame, on the other hand (i.e., SLU services, now condition FAA10). In so doing, we have clarified that the main obligations to provide LLU and SLU include, where also so requested, such ancillary

services as may be reasonably necessary for the use of those services. We have also proposed some definitional changes mainly to deal with this restructuring. The proposed specific remedies on VULA and PIA discussed below also follow a similar structure.

9.9 As in SMP condition FA9, the proposed condition also provides Ofcom with a specific power to issue directions and requires BT to comply with any such directions. The latter compliance requirement is needed as Ofcom's enforcement powers relate to breaches of conditions and any breach of direction will therefore amount to a breach of the condition itself. We rely on our statutory powers in section 45(10) of the Act in this regard. Therefore, BT will be required to provide such ancillary services or other network access as Ofcom may from time to time direct to ensure the provision of LLU services. We will follow the process in section 49 of the Act in making any such directions.

9.10 As explained in Section 6, we propose that BT should also be required to include some minimum specific requirements in the RO relevant to LLU services (see SMP condition FAA5.3 (LLU)). We are also proposing to give a direction under the proposed condition FAA8 concerning quality of service remedy that would formalise the existing KPI reporting on LLU that BT currently provides through Openreach and the OTA framework.

Legal tests

9.11 We consider that the proposed obligation to provide LLU services, together with such ancillary services as may be reasonably necessary for the use of those services (Condition FAA9), is appropriate and satisfies the other legal tests set out in the Act.

9.12 We have considered our duties under section 3 and the Community requirements set out in section 4 of the Act. In particular, the condition is aimed at promoting and securing efficient and sustainable competition for the maximum benefit of retail customers because it will continue to enable OCPs to compete effectively with BT in downstream narrowband and broadband markets with respect to current generation services. We consider that these services will remain an extremely important element of this market over the forward looking period of this review.

9.13 In that way, we consider that the performance of our general duties in section 3 of the Act will also be secured or furthered by or in relation to this proposed LLU remedy, namely to further the interests of citizens in relation to this sector specific regulation and to further the interests of consumers in relevant markets, by promoting competition in this upstream market.

9.14 The proposed condition satisfies the criteria set out in section 47(2) of the Act because it is:

- objectively justifiable, in that it relates to the need to ensure that competition develops ultimately to the benefits of consumers. LLU services are aimed at stimulating competition in the provision of broadband and telephony services and enhancing competition in areas of limited local access competition. Removing the condition could result in BT withdrawing the product or otherwise changing it to the detriment of the existing level of effective downstream competition;

- not unduly discriminatory, as the condition aims to address BT's market power in this market and as the obligation imposed on KCOM to provide network access

on reasonable request is sufficient to ensure that KCOM provides LLU services should a reasonable request be made;

- proportionate, in that the requirement is necessary to promote efficient and sustainable competition for the maximum benefit of retail customers, and the means to achieve that aim are the least burdensome on BT, also taking account of the fact that BT already supplies this service; and

- transparent, as it is clear in its intention to require BT to provide LLU services to OCPs and its intended operation should also aided by our explanations in this document.

9.15 In proposing this condition, we have also taken into account the factors set out in section 87(4) of the Act. In particular, the economic viability of OCPs building alternative access networks and the feasibility of BT providing LLU services and we believe the condition should also continue to help ensuring the need to secure effective competition in the long term.

Sub-loop Unbundling Services (SLU)

Aim and effect of regulation

9.16 As also discussed in previous sections, SLU services enable OCPs to rent wholly or partly local copper access network connections from BT so that they can provide services directly to end users using their own equipment. The connections are accessed at an intermediate point in BT's access network between MDF sites and the customers' premises. In most cases, this will be a BT street cabinet thus enabling OCPs to create FTTC networks which are capable of supporting higher bandwidths than DSL-based broadband services served from MDF sites (e.g., those using LLU services).

9.17 SLU therefore allows OCPs to compete effectively with BT for the provision of FTTC-based NGA end user services without having to replicate BT's entire access network. SLU gives OCPs flexibility to innovate and differentiate their services from those provided by BT.

9.18 BT has been subject to a requirement to provide SLU services since 2001. To date, there has been very limited take up of the service. However, some rollout of SLU services is planned as part of regional broadband initiatives and, with increasing interest in NGA network deployment, there is potential for demand to increase over the forward looking period of this review.

9.19 Accordingly, having considered the options discussed in Section 7, we are proposing to maintain the obligation on BT to specifically provide SLU services on fair and reasonable terms, conditions and charges to all OCPs who reasonably request in writing such services.

9.20 For reasons discussed above for LLU, we propose to separate this SLU obligation into a distinct SMP condition FAA10, together with some other changes similar to those discussed above with regard to LLU, including providing Ofcom with a specific power to issue directions and requires BT to comply with any such directions. The proposed condition does not, however, specify a specific product, thereby allowing CPs to request the product that best suits their needs.

9.21 For that reason, in contrast to the proposed LLU remedy above, we are not proposing that BT should be required to include some minimum specific requirements in the RO relevant to SLU. This is because we believe that the existing general requirements are sufficient, given the current stage of SLU's development. However, as with the proposed LLU obligation and other specific access remedies (unless the context suggests otherwise), the proposed general remedies discussed in Section 6 would still apply on BT, such as its requirement to produce a RO.

Legal tests

9.22 We consider that the proposed obligation to provide SLU services, together with such ancillary services as may be reasonably necessary for the use of those services (Condition FAA10), is appropriate and satisfies the other legal tests set out in the Act.

9.23 We have considered our duties under section 3 and the Community requirements set out in section 4 of the Act. In particular, the condition is aimed at promoting and securing efficient and sustainable competition for the maximum benefit of retail customers because it will continue to enable OCPs to compete effectively with BT in downstream narrowband and broadband markets with respect to FTTC-based services. We consider that these services could become an important element of this market over the forward looking period of this review in the event that FTTC-based services are rolled out.

9.24 In that way, we consider that the performance of our general duties in section 3 of the Act will also be secured or furthered by or in relation to this proposed SLU remedy, namely to further the interests of citizens in relation to this sector specific regulation and to further the interests of consumers in relevant markets, by promoting competition in this upstream market.

9.25 The proposed condition satisfies the criteria set out in section 47(2) of the Act because it is:

- objectively justifiable, in that it relates to the need to ensure that competition develops ultimately to the benefits of consumers. SLU services are aimed at stimulating competition in the provision of broadband and telephony services and enhancing competition in areas of limited local access competition. Removing the condition could result in BT withdrawing the product or otherwise changing it to the detriment of the existing level of downstream competition;

- not unduly discriminatory, as the condition aims to address BT's market power in this market and as the obligation imposed on KCOM to provide network access on reasonable request is sufficient to ensure that KCOM provides SLU services should a reasonable request be made;

- proportionate, in that the requirement is necessary to promote efficient and sustainable competition for the maximum benefit of retail customers, and the means to achieve that aim are the least burdensome on BT, also taking account of the fact that BT already supplies this service; and

- transparent, as it is clear in its intention to require BT to provide SLU services to OCPs and its intended operation should also aided by our explanations in this document.

9.26 In proposing this condition, Ofcom has also taken into account the factors set out in section 87(4) of the Act. In particular, the economic viability of OCPs building

alternative access networks and the feasibility of BT providing SLU services we believe the condition should also continue to help ensuring the need to secure effective competition in the long term.

Virtual Unbundled Local Access Services (VULA)

Aim and effect of regulation

9.27 As also discussed in previous sections, a proposed new remedy on BT to provide VULA services would enable OCPs to rent data connections over NGA networks between local aggregation points and end user premises so they can provide voice and/or data services directly to end users.

9.28 As BT rolls out its NGA network, VULA would therefore allow OCPs to compete effectively with BT for the provision of end user NGA services without having to replicate BT's NGA network. VULA also gives OCPs a level of flexibility similar to that of a physical access product, such as LLU, enabling them to innovate and differentiate their services from those provided by BT.

9.29 Accordingly, having considered the options discussed in Section 7, we are proposing that BT should be specifically required to provide VULA services on fair and reasonable terms, conditions and charges as soon as reasonably practicable to all OCPs who reasonably request in writing such services.

9.30 As with the proposed LLU and SLU obligations, we propose that this VULA obligation should be set as a distinct SMP condition (FAA11). For reasons similar to LLU and SLU, we propose that, in addition to the main requirement on BT to provide VULA, it includes a requirement to provide such ancillary services as may be reasonably necessary for the use of VULA. We are further proposing that BT should provide such ancillary services or other network access as Ofcom may from time to time direct to ensure the provision of VULA and to require BT to comply with any such directions, again for similar reasons to those discussed above.

9.31 As regards to the meaning of the VULA, we refer to our more detailed discussion in previous sections. For the purpose of SMP condition FAA11, we are proposing to define the VULA concept as network access comprising of a virtual circuit between a point of connection at the local serving exchange and a network termination point ("NTP"), which circuit provides such specified capacity as is agreed between BT and the OCP for the OCP's exclusive use. We refer to that draft condition for related definitions of expressions, such as local serving exchange.

9.32 In contrast to the proposed LLU remedy, but similarly to SLU above, we are not proposing that BT should be required to include some minimum specific requirements in the RO in relation to VULA. This is because we believe that the existing general requirements are sufficient, given the current stage of VULA's development. However, as with the proposed LLU and SLU obligations (unless the context suggests otherwise), the proposed general remedies discussed in Section 6 would still apply on BT, such as its requirement to produce a RO.

9.33 However, in contrast to other proposed specific access remedies, the general obligation on BT not to unduly discriminate in the proposed SMP condition FAA3 shall not apply to BT's VULA obligation. We clarify that intention on the face of FAA3 itself by making it clear that we propose that Condition FAA11.3 should contain a specific obligation of non-discrimination on BT in relation to VULA.

9.34 For VULA, we are proposing to take a more strict approach to no undue discrimination as we discussed in Section 7. In particular, we will expect our approach to requiring BT not to discriminate in providing VULA to mirror, in effect, the EoI requirements, as set out in BT's Undertakings. Broadly put, that would mean that we would be likely to find BT in breach of this requirement if it were to provide a non-physical product out of this market to its own downstream divisions without first making this product available to OCPs on the same timescales, terms and conditions (including price and service levels), by means of the same systems and processes and by providing the same information.

9.35 We consider that this approach to no undue discrimination is appropriate, as VULA is expected to be the main basis for competition in NGA-based services for the period covered by this review. We also consider that this approach is proportionate as VULA is a new product and, as such, there will be no need to re-engineer existing products.

9.36 In light of that need and importance, we are further proposing for the EoI concept contained in that condition BT may be deemed to place itself at a competitive advantage and not to provide OCPs on an EoI basis, unless the provision is exactly the same subject only to: (i) trivial differences; and (ii) differences relating to credit vetting procedures, payment procedures, matters of national and crime-related security, physical security, security required to protect the operational integrity of the network, provisions relating to the termination of a contract, or contractual provisions relating to requirements for a safe working environment. Other than those things, we consider that BT may not show any other reasons in seeking to objectively justify the provision in a different manner.

Legal tests

9.37 We consider that the proposed obligation to provide VULA services, together with such ancillary services as may be reasonably necessary for the use of those services (Condition FAA11), is appropriate and satisfies the other legal tests set out in the Act.

9.38 We have considered our duties under section 3 and the Community requirements set out in section 4 of the Act. In particular, the condition is aimed at promoting and securing efficient and sustainable competition for the maximum benefit of retail customers because it will enable OCPs to compete with BT in downstream narrowband and broadband markets with respect to NGA services in those areas where BT rolls out an NGA network. We consider that these services may become an important element of this market over the forward looking period of this review. In relation to the EoI requirement for VULA, we also consider that it would achieve those aims by preventing BT from leveraging its market power into downstream markets.

9.39 In that way, we consider that the performance of our general duties in section 3 of the Act will also be secured or furthered by or in relation to this proposed VULA remedy, namely to further the interests of citizens in relation to this sector specific regulation and to further the interests of consumers in relevant markets, by promoting competition in this upstream market. We have also had particular regard to the desirability of encouraging the availability and use of high speed transfer services throughout the UK in proposing this condition.

9.40 The proposed condition satisfies the criteria set out in section 47(2) of the Act because it is:

- objectively justifiable, in that it relates to the need to ensure that competition develops ultimately to the benefits of consumers. VULA services are aimed at stimulating competition in the provision of broadband and telephony services and enhancing competition in areas of limited local access competition. We consider that, without this specific obligation, it could result in BT not offering wholesale access to its NGA network to the detriment of competition that has developed in this market as BT deploys NGA networks. We believe that VULA will become an important new product that we anticipate will become the primary basis of competition for NGA-based high speed services;

- not unduly discriminatory, as the condition aims to address BT's market power in this market and as the obligation imposed on KCOM to provide network access on reasonable request is sufficient to ensure that KCOM provides VULA services should a reasonable request be made;

- proportionate, in that the requirement is necessary to promote efficient and sustainable competition for the maximum benefit of retail customers with the rollout of NGA networks, and the means to achieve that aim are the least burdensome on BT; and

- transparent, as it is clear in its intention to require BT to provide VULA services to OCPs and its intended operation should also aided by our explanations in this document.

9.41 In proposing this condition, we have also taken into account the factors set out in section 87(4) of the Act. In particular, the economic viability of OCPs building alternative access networks and the feasibility of BT providing VULA services and we believe that the condition should also help ensuring the need to secure effective competition in the long term.

Physical Infrastructure Access Services (PIA)

Aim and effect of regulation

9.42 As also discussed in previous sections, a proposed new remedy on BT to provide PIA services would enable OCPs to use the physical infrastructure of BT's local access network (mainly ducts, chambers and poles) to deploy NGA networks.

9.43 The physical infrastructure in and on which NGA networks are deployed constitutes a large proportion of the overall cost of NGA network deployment. Ofcom therefore considers that the availability of PIA services on cost-oriented terms will significantly reduce the barrier to NGA network deployment by OCPs and would enable more efficient investment in NGA networks. It therefore promotes competition and investment in NGA networks.

9.44 PIA would therefore support the deployment of NGA networks by OCPs and would be particularly relevant in areas where BT does not deploy an NGA network and VULA services would not be available.

9.45 Accordingly, having considered the options discussed in Section 7, we are proposing that BT should be specifically required to provide PIA services on fair and reasonable terms, conditions and charges as soon as reasonably practicable to all OCPs who reasonably request in writing such services.

9.46 As with the proposed specific access remedies above, we propose that this PIA obligation should be set as a distinct SMP condition (FAA12). For reasons similar to those remedies, we propose that, in addition to the main requirement on BT to provide PIA, it includes a requirement to provide such ancillary services as may be reasonably necessary for the use of PIA. We are further proposing that BT should provide such ancillary services or other network access as Ofcom may from time to time direct to ensure the provision of PIA and to require BT to comply with any such directions, again for similar reasons to those discussed above.

9.47 As explained in Section 7 and Annex 11, and similarly to the LLU remedy, we propose that BT should also be required to include some minimum specific requirements in the RO relevant to PIA services (see SMP condition FAA5.3 (PIA)), in addition to its other general obligations discussed in Section 6.

9.48 However, we propose that BT's PIA obligation should be subject to an important limitation. Namely, BT should be required to provide PIA, together with such ancillary services as may be reasonably necessary for the use of that access, if, and only if, such access and services are to be used by OCPs for the purpose of deployment of broadband access networks serving multiple residential and business customers. We refer to our discussion in Section 7 for our reasons in this regard.

9.49 As regards to the meaning of the PIA, we refer to our more detailed discussion in previous sections. For the purpose of SMP condition FAA12, we are proposing to define the PIA concept as network access comprising predominantly of the provision of space, anchorage, attachment facilities and/or such other facilities as may be reasonably necessary to permit an OCP to occupy parts of BT's physical infrastructure located between NTPs and MDF sites serving those NTPs, sufficient to facilitate the establishment, installation, operation and maintenance of the OCP's electronic communications network at that location. By physical infrastructure, we propose that this includes any conduit, tunnel, subway, pipe, structure, pole or other thing in, on, by or from which an electronic communications network is or may be installed, supported, carried or suspended.

Legal tests

9.50 We consider that the proposed obligation to provide PIA services, together with such ancillary services as may be reasonably necessary for the use of those services (Condition FAA12), is appropriate and satisfies the other legal tests set out in the Act.

9.51 We have considered our duties under section 3 and the Community requirements set out in section 4 of the Act. In particular, the condition is aimed at promoting and securing efficient and sustainable competition for the maximum benefit of retail customers by enabling OCPs to compete with BT in downstream narrowband and broadband markets with respect to NGA services. We consider that these services may become an important element of this market over the forward looking period of this review.

9.52 In that way, we consider that the performance of our general duties in section 3 of the Act will also be secured or furthered by or in relation to this proposed PIA remedy, namely to further the interests of citizens in relation to this sector specific regulation and to further the interests of consumers in relevant markets, by promoting competition in this upstream market. We have also had particular regard to the desirability of encouraging the availability and use of high speed transfer services throughout the UK in proposing this condition.

9.53 The proposed condition satisfies the criteria set out in section 47(2) of the Act because it is:

- objectively justifiable, in that it relates to the need to ensure that competition develops to the benefits of consumers. PIA services are intended to promote competition and efficient investment in NGA networks. We consider that, without this specific obligation, it could result in BT not offering wholesale access to its access network to the detriment of the competition that has developed in this market;

- not unduly discriminatory, as the condition aims to address BT's market power in this market and as the obligation imposed on KCOM to provide network access on reasonable request is sufficient to ensure that KCOM provides PIA services should a reasonable request be made;

- proportionate, in that the requirement is necessary to promote competition and secure efficient investment in NGA networks for the maximum benefit of retail customers, and the means to achieve that aim are the least burdensome on BT; and

- transparent, as it is clear in its intention to require BT to provide PIA to OCPs and its intended operation should also aided by our explanations in this document.

9.54 In proposing this condition, we have also taken into account the factors set out in section 87(4) of the Act. In particular, the feasibility and the technical and economic viability for BT to provide PIA services and we believe the condition should also help ensuring the need to secure effective competition in the long term.

Consultation question

Question 14 Do you agree with our assessment against the legal tests for each specific remedy, as set out in Section 9?

Section 10

Next steps

Introduction

10.1 This section summarises our next steps in relation to this market review. We cover:

- Our consultation process in this market review; and
- Implementation issues with the proposed new SMP remedies of:
  - Physical Infrastructure Access; and
  - Virtual Unbundled Local Access.

Consultation process

10.2 We are consulting on the proposals in this document for ten weeks, until 1 June 2010. More details on the consultation process, and how to respond, are covered in Annexes 1 to 4. Annex 4 summarises the specific consultation questions that we have asked in preceding sections.

10.3 Stakeholders should note that in conjunction with this document, we have also published some associated documents, which we refer to in this document and which are published on our website. These are:

- Surveys of BT's physical (duct and pole) infrastructure;
- Study of the economics of shared infrastructure access; and
- A report on the consumer research done for this review and the 2010 WBA market review.

Implementation of WLA remedies

The PIA obligation

10.4 In Section 7 we proposed implementation timescales for an obligation on duct and pole access, if that obligation is confirmed following consultation.

10.5 For duct access, we consider that BT should be required to produce a first version of a RO within three months of the publication of our statement. Based on our experience with other complex remedies such as LLU and CPS we that it would be beneficial for BT to review its initial RO with an industry working group in order to refine the service to meet OCPs' needs and to iron out any operational details. One option is that this process would be facilitated by the OTA.

10.6 In order to inform the product development activities and the industry discussions, Ofcom has commissioned a report on the practical and operational issues around shared infrastructure access. The report will contain a number of international case studies that examine the issues encountered in other countries and the solutions adopted to address them. We aim to publish the report in May 2010.

10.7 Following three months of discussions with the industry working group, BT could then produce a revised RO within a further two months. We envisage that BT could then launch the product, probably based on low volumes to allow testing of the operational processes.

10.8 BT has indicated that it is likely to be more complex and time consuming to develop arrangements for pole access. We therefore consider that there should be a separate work stream for pole access, particularly for the industry working group discussions. We have therefore proposed that BT should be required to produce a RO for pole sharing within six months of the publication of our statement. However, as CPs are likely to wish to use both duct and poles together, our preference is for BT to produce an initial version of the pole sections of the RO alongside the duct sections if possible.

10.9 If required, we will conduct a formal review of BT's charges in order to provide reassurance to industry and to avoid a dispute. Our review would be followed by a consultation on our conclusions, with a direction setting the charges.

10.10 Also, while preferring BT and OCPs to agree on the details of the RO, if this is not possible we may need to formally consult on a direction to resolve some issues.

VULA

10.11 To meet the key characteristics of VULA, we consider that some small changes to BT's current GEA products would be necessary, for example:

- For the FTTC GEA products, BT has so far proposed to make them available only in combination with other products/service. However, we consider that a VULA service would need to be made available on a stand-alone basis; and

- For the FTTP-based GEA products, BT has chosen to embed an ATA into the NTE, which currently is a necessary part of the GEA product. We recognise that there are good economic and commercial reasons for this approach. However, to meet the VULA requirements, we consider that the arrangements known as open ATA (which include control for interconnecting CPs) would be an essential requirement if the voice ATA is embedded into the GEA/VULA product.

10.12 Of course, as set out in Section 7, as the GEA/VULA product develops, CPs may want different product features. We consider that BT should be prepared to meet reasonable requests for such alternatives.

Annex 1

Responding to this consultation

How to respond

A1.1 Ofcom invites written views and comments on the issues raised in this document, to be made **by 5pm on Tuesday 1 June 2010**.

A1.2 Ofcom strongly prefers to receive responses using the online web form, at http://www.ofcom.org.uk/consult/condocs/wla/howtorespond/form, 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 (see Annex 3), to indicate whether or not there are confidentiality issues. This response coversheet is incorporated into the online web form questionnaire.

A1.3 For larger consultation responses - particularly those with supporting charts, tables or other data - please email wlamarketreview@ofcom.org.uk attaching your response in Microsoft Word format, together with a consultation response coversheet.

A1.4 Responses may alternatively be posted or faxed to the address below, marked with the title of the consultation.

Nic Green
4th Floor
Competition Group
Riverside House
2A Southwark Bridge Road
London SE1 9HA

Fax: 020 7783 4109

A1.5 Note that we do not need a hard copy in addition to an electronic version. Ofcom will acknowledge receipt of responses if they are submitted using the online web form but not otherwise.

A1.6 It would be helpful if your response could include direct answers to the questions asked in this document, which are listed together at Annex 4. It would also help if you can explain why you hold your views and how Ofcom's proposals would impact on you.

Further information

A1.7 If you want to discuss the issues and questions raised in this consultation, or need advice on the appropriate form of response, please contact Nic Green on 020 7783 4154.

Confidentiality

A1.8 We believe 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, ideally on receipt. If you think your

response should be kept confidential, can you please specify what part or whether all of your response should be kept confidential, and specify why. Please also place such parts in a separate annex.

A1.9 If someone asks us to keep part or all of a response confidential, we will treat this request seriously and will try to respect this. But sometimes we will need to publish all responses, including those that are marked as confidential, in order to meet legal obligations.

A1.10 Please also note that copyright and all other intellectual property in responses will be assumed to be licensed to Ofcom to use. Ofcom's approach on intellectual property rights is explained further on its website at http://www.ofcom.org.uk/about/accoun/disclaimer/

Next steps

A1.11 Following the end of the consultation period included in this document, Ofcom intends to publish a statement during Autumn 2010.

A1.12 Please note that you can register to receive free mail updates alerting you to the publications of relevant Ofcom documents. For more details please see: http://www.ofcom.org.uk/static/subscribe/select_list.htm

Ofcom's consultation processes

A1.13 Ofcom seeks to ensure that responding to a consultation is easy as possible. For more information please see our consultation principles in Annex 2.

A1.14 If you have any comments or suggestions on how Ofcom conducts its consultations, please call our consultation helpdesk on 020 7981 3003 or e-mail 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, who are less likely to give their opinions through a formal consultation.

A1.15 If you would like to discuss these issues or Ofcom's consultation processes more generally you can alternatively contact Vicki Nash, Director Scotland, who is Ofcom's consultation champion:

Vicki Nash
Ofcom
Sutherland House
149 St. Vincent Street
Glasgow G2 5NW

Tel: 0141 229 7401
Fax: 0141 229 7433

Email vicki.nash@ofcom.org.uk

Annex 2

Ofcom's consultation principles

A2.1 Ofcom has published the following seven principles that it will follow for each public written consultation:

Before the consultation

A2.2 Where possible, we will hold informal talks with people and organisations before announcing a big 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

A2.3 We will be clear about who we are consulting, why, on what questions and for how long.

A2.4 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 Plain English Guide for smaller organisations or individuals who would otherwise not be able to spare the time to share their views.

A2.5 We will consult for up to 10 weeks depending on the potential impact of our proposals.

A2.6 A person within Ofcom 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. Ofcom's 'Consultation Champion' will also be the main person to contact with views on the way we run our consultations.

A2.7 If we are not able to follow one of these principles, we will explain why.

After the consultation

A2.8 We think it is important for everyone interested in an issue to see the views of others during a consultation. We would usually publish all the responses we have received on our website. In our statement, we will give reasons for our decisions and will give an account of how the views of those concerned helped shape those decisions.

Annex 3

Consultation response cover sheet

A3.1 In the interests of transparency and good regulatory practice, we will publish all consultation responses in full on our website, www.ofcom.org.uk.

A3.2 We have produced a coversheet for responses (see below) and would be very grateful if you could send one with your response (this is incorporated into the online web form if you respond in this way). This will speed up our processing of responses, and help to maintain confidentiality where appropriate.

A3.3 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 coversheet in a way that allows Ofcom to publish their responses upon receipt, rather than waiting until the consultation period has ended.

A3.4 We strongly prefer to receive responses via the online web form which incorporates the coversheet. If you are responding via email, post or fax you can download an electronic copy of this coversheet in Word or RTF format from the 'Consultations' section of our website at www.ofcom.org.uk/consult/.

A3.5 Please put any parts of your response you consider should be kept confidential in a separate annex to your response and include your reasons why this part of your response should not be published. 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: Review of the wholesale local access market

To (Ofcom contact): Nic Green, Competition Group

Name of respondent:

Representing (self or organisation/s):

Address (if not received by email):

CONFIDENTIALITY

Please tick below what part of your response you consider is confidential, giving your reasons why

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

If you want part of your response, your name or your organisation not to be published, can Ofcom still publish a reference to the contents of your response (including, for any confidential parts, a general summary that does not disclose the specific information or enable you to be identified)?

DECLARATION

I confirm that the correspondence supplied with this cover sheet is a formal consultation response that Ofcom can publish. However, in supplying this response, I understand that Ofcom may need to publish all responses, including those which are marked as confidential, in order to meet legal obligations. If I have sent my response by email, Ofcom can disregard any standard e-mail 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 4

Consultation questions

A4.1 Below we list all of the questions that we ask in this consultation. Respondents are advised to consider the analysis included this consultation in answering these questions.

Question 1 Do you agree with our proposed product market definition? If not, please explain why.

Question 2 Do you agree with our proposed geographic market definition? If not, please explain why.

Question 3 Do you agree with our proposals that BT and KCOM have SMP in their respective geographic markets? If not, please explain why.

Question 4 Do you agree with our proposals for the general access requirements that should apply to BT and KCOM respectively? If not, please explain why.

Question 5 Do you agree that Ofcom should impose a new network access obligation on KCOM, that would require it to follow a statement of requirements process to handle requests for new network access in this market? If not, please explain why.

Question 6 In relation to LLU, do you agree with the assessment and options set out?

Question 7 In relation to fibre access, do you agree with the potential unbundling arrangements for the different fibre architectures and the positions/options set out given the current and expected future availability of fibre within BT's access network?

Question 8 In relation to SLU, do you agree with the assessment and options set out?

Question 9 In relation to PIA, do you agree with the proposed PIA obligation structure and the proposed implementation arrangements?

Question 10 In relation to VULA, do you agree that VULA may be a necessary access remedy in the WLA market and if so, do you agree with the key characteristics identified and how these currently relate to BT's GEA products?

Question 11 Do you agree with the framework for considering specific access remedies on BT?

Question 12 Do you agree that there is a need to have a complementary set of access remedies and if so, do you agree with the proposed set of remedies on BT?

Question 13 Do you agree that no specific access remedies should be imposed on KCOM in the WLA market at this time? Could any remedies on KCOM at the WLA market level address the competition issues that we have identified?

Question 14 Do you agree with our assessment against the legal tests for each specific remedy, as set out in Section 9?

Annex 5

Market review process

Introduction

A5.1 This annex provides an overview of the market review process to give some additional context and understanding of the matters discussed in the main body of this document and the legal instruments (statutory notifications) published at Annexes 6 and 7.

A5.2 Market review regulation is technical and complex, including the legislation and the recommendations and guidelines that we need to consider as part of the process. There may be many relevant documents depending on the market and/or issues in question. This overview does not purport to give a full and exhaustive account of all such materials that we have considered in reaching our preliminary views on this market. Key aspects of materials relevant to this market review are, however, discussed in this document.

Market review concept

A5.3 The concept of a market review refers to procedures under which we at regular intervals identify relevant markets appropriate to national circumstances, carry out analyses of these markets to determine whether they are effectively competitive and then decide on appropriate remedies (known as SMP obligations or conditions). We explain the concept of SMP (significant market power) below.

A5.4 In carrying out this work, we act in our capacity as the sector-specific regulator for the UK communications industries, particularly relating to our role as the regulator for telecommunications. Our functions in this regard are to be found in Part 2 of the Communications Act 2003 (the "Act"). We exercise those functions within the framework harmonised across the European Union for the regulation of electronic communications by the Member States (known as the "Common Regulatory Framework" or the "CRF"), as transposed by the Act. The applicable rules[107] are contained in a package of five EC Directives, of which two Directives are immediately relevant for these purposes, namely:

- Directive 2002/21/EC on a common regulatory framework for electronic communications networks and services (the "Framework Directive"); and
- Directive 2002/19/EC on access to, and interconnection of, electronic communications networks and associated facilities (the "Access Directive").

A5.5 The Directives require that National Regulatory Authorities ("NRAs") (such as Ofcom) carry out reviews of competition in communications markets to ensure that SMP regulation remains appropriate and proportionate in the light of changing market conditions.

A5.6 Each market review normally has three stages, namely:

[107] The Directives have recently been reviewed and amendments were adopted on 19 December 2009. The amendments will need to be transposed into the national legislation by 25 May 2011, and then apply with effect from 26 May 2011.

- the procedure for the identification and definition of the relevant markets (the market definition procedure);
- the procedure for the assessment of competition in each market, in particular whether the relevant market is effectively competitive (the market analysis procedure); and
- the procedure for the assessment of appropriate regulatory obligations (the remedies procedure).

A5.7 These stages are normally carried out together.

Market definition procedure

A5.8 The Act provides that, before making a market power determination[108], we must identify the market, which is, in our opinion, the one which, in the circumstances of the UK, is the market in relation to which it is appropriate to consider making such a determination and to analyse that market.

A5.9 The Framework Directive requires that NRAs shall, taking the utmost account of the Recommendation on Relevant Product and Service Markets[109] and SMP Guidelines[110] published by the European Commission, define the relevant markets appropriate to national circumstances, in particular relevant geographic markets within their territory, in accordance with the principles of competition law.

A5.10 The Recommendation identifies a set of product and service markets within the electronic communications sector in which *ex ante* regulation may be warranted. Its purpose is twofold. First, seeking to achieve harmonisation across the single market by ensuring that the same markets will be subject to a market analysis in all Member States. Secondly, providing legal certainty by making market players aware in advance of the markets to be analysed. However, NRAs are able to regulate markets that differ from those identified in the Recommendation where this is justified by national circumstances taking account of the three cumulative criteria referred to in the Recommendation[111] (the "three-criteria test") and where the European Commission does not raise any objections.

A5.11 The fact that an NRA identifies the product and service markets listed in the Recommendation or identifies other product and service markets that meet the three-criteria test does not mean that regulation is warranted. Market definition is

[108] The market power determination concept is used in the Act to refer to a determination that a person has SMP in an identified services market.
[109] Commission Recommendation of 17 December 2007 on relevant product and service markets within the electronic communications sector susceptible to *ex ante* regulation in accordance with Directive 2002/21/EC of the European Parliament and of the Council on a common regulatory framework for electronic communication networks and services.
[110] Commission guidelines on market analysis and the assessment of significant market power under the Community regulatory framework for electronic communications networks and services (2002/C 165/03).
[111] The Recommendation states that, "[w]hen identifying markets other than those set out in the Annex, national regulatory authorities should ensure that the following three criteria are cumulatively met: (a) the presence of high and non-transitory barriers to entry. These may be of a structural, legal or regulatory nature; (b) a market structure which does not tend towards effective competition within the relevant time horizon. The application of this criterion involves examining the state of competition behind the barriers to entry; (c) the insufficiency of competition law alone to adequately address the market failure(s) concerned."

not an end in itself but is a means of assessing effective competition. The three-criteria test is also different from the SMP assessment because the test's focus is on the general structure and market characteristics.

A5.12 The relationship between the market definition identified in this review and the ones listed in the Recommendation is discussed in Section 3 of this document.

A5.13 The SMP Guidelines make clear that market definition is not a mechanical or abstract process. It requires an analysis of any available evidence of past market behaviour and an overall understanding of the mechanics of a given sector. As market analyses have to be forward-looking, the Guidelines state that NRAs should determine whether the market is prospectively competitive, and thus whether any lack of effective competition is durable, by taking into account expected or foreseeable market developments over the course of a reasonable period. They clarify that NRAs enjoy discretionary powers which reflect the complexity of all the relevant factors that must be assessed (economic, factual and legal) when identifying the relevant market and assessing whether an undertaking has SMP.

A5.14 The SMP Guidelines also describe how competition law methodologies may be used by NRAs in their analyses. In particular, there are two dimensions to the definition of a relevant market: the relevant products to be included in the same market and the geographic extent of the market. Ofcom's approach to market definition follows that used by the UK competition authorities, which is in line with the approaches adopted by the European Commission.

A5.15 While such methodologies are being used in identifying the *ex ante* markets, they will not necessarily be identical to markets defined in individual competition law cases. This may be the case, especially as the former is based on an overall forward-looking assessment of the structure and the functioning of the market under examination. Accordingly, the economic analysis carried out for the purpose of this review, including the identified markets, is without prejudice to any analysis that may be carried out in relation to any investigation pursuant to the Competition Act 1998 (relating to the application of the Chapter I or II prohibitions or Article 81 or 82 of the EC Treaty) or the Enterprise Act 2002.

Market analysis procedure

Effective competition

A5.16 The Act requires that, at such intervals as we consider appropriate, we carry out market analyses of identified markets for the purpose of making or reviewing market power determinations. In any event, such analyses are to be carried out as soon as reasonably practicable after recommendations are made by the European Commission that affect matters that were taken into account, or could have been taken into account, in the case of our last analysis of that market.

A5.17 In carrying out a market analysis, the key issue for an NRA is to determine whether the market in question is *effectively competitive*. The 27th recital to the Framework Directive clarifies the meaning of that concept. Namely, "[it] is essential that *ex ante* regulatory obligations should only be imposed where there is not effective competition, i.e., in markets where there are one or more undertakings with significant market power, and where national and Community competition law remedies are not sufficient to address the problem".

A5.18 The definition of SMP is equivalent to the concept of dominance as defined in competition law. The Framework Directive requires, however, that NRAs must carry out market analysis taking the utmost account of the SMP Guidelines. The latter emphasise that NRAs should undertake a thorough and overall analysis of the economic characteristics of the relevant market before coming to a conclusion as to the existence of significant market power.

A5.19 In that regard, the SMP Guidelines set out, additionally to market shares, a number of criteria that can be used by NRAs to measure the power of an undertaking to behave to an appreciable extent independently of its competitors, customers and consumers, including (a) overall size of the undertaking; (b) control of infrastructure not easily duplicated; (c) technological advantages or superiority; (d) absence of or low countervailing buying power; (e) easy or privileged access to capital markets/financial; (f) resources; (g) product/services diversification (e.g., bundled products or services); (h) economies of scale; (i) economies of scope; (j) vertical integration; (k highly developed distribution and sales network; (l) absence of potential competition; and (m) barriers to expansion. A dominant position can derive from a combination of these criteria, which taken separately may not necessarily be determinative.

Sufficiency of competition law

A5.20 As part of our overall forward-looking analysis, we also assess whether competition law by itself (without *ex ante* regulation) is sufficient to address the competition problems identified. Aside from the need to address this issue as part of the three-criteria test, we normally also conclude on this matter in dealing with the appropriate remedies which, as explained below, are based on the nature of the specific competition problems we identify. We always consider the option of no *ex ante* regulation, while noting that the SMP Guidelines clarify that, if NRAs designate undertakings as having SMP, they must impose on them one or more regulatory obligations.

A5.21 In considering this matter, we bear in mind the specific characteristics of communications markets. Generally, the case for *ex ante* regulation in communications markets is based on the existence of market failures, which, by themselves or in combination, mean that competition might not be able to become established, if the regulator relied solely on its *ex post* competition law powers that are established for dealing with more conventional sectors of the economy. Therefore, it is appropriate for *ex ante* regulation to be used to address these market failures and any entry barriers that might otherwise prevent effective competition from becoming established. By imposing *ex ante* regulation that promotes competition, it may be possible to reduce such regulation over time, as markets become more competitive, and instead place greater reliance on *ex post* competition law.

A5.22 *Ex post* competition law is also unlikely in itself to bring about effective competition, as it prohibits the abuse of dominance rather than the holding of a dominant position. In contrast, *ex ante* regulation is normally needed to promote actively the development of competition. *Ex ante* regulation attempts to reduce the level of market power in a market, thereby encouraging effective competition to become established. This is particularly the case when addressing the effects of network externalities, because the network externality effect generally re-enforces a dominant position and, as noted above, under general competition law there is no prohibition on the holding of a position of dominance in itself. Therefore, it is more

appropriate to address the impact of network externality through *ex ante* obligations.

A5.23 Additionally, unless we consider otherwise in relation to a specific obligation in this review, we generally take the view that *ex ante* regulation is needed to create legal certainty for the market under review. Linked to that certainty is the fact that the SMP obligations we have proposed are necessary to enable us to intervene in a timely manner. For some other specific obligations, we generally consider that they are needed as competition law would not remedy the particular market failure, or we believe that specific clarity and detail of the obligation is required to achieve a particular result.

Remedies procedure

Powers and legal tests

A5.24 The Framework Directive prescribes what regulatory action NRAs must take depending upon whether or not the market in question has been found effectively competitive. Where a market has been found effectively competitive, NRAs are not allowed to impose SMP obligations and must withdraw such obligations where they already exist. On the other hand, where the market is found not effectively competitive, the NRAs must identify the undertakings with SMP on that market and then impose appropriate obligations.

A5.25 NRAs have a suite of regulatory tools at their disposal, as reflected in the Act. Specifically, the Access Directive specifies a number of SMP obligations, including transparency, non-discrimination, accounting separation, access to and use of specific network elements and facilities, price control and cost accounting. When imposing a specific obligation, the NRA will need to demonstrate that the obligation in question is based on the nature of the problem identified, proportionate and justified in the light of the policy objectives as set out in Article 8 of the Framework Directive, as implemented by national law.

A5.26 Specifically, for each and every proposed SMP obligation we explain why it satisfies the test that the obligation is: (a) *objectively justifiable* in relation to the networks, services, facilities, apparatus or directories to which it relates; (b) *not such as to discriminate unduly* against particular persons or against a particular description of persons; (c) *proportionate* to what the condition or modification is intended to achieve; and (d) in relation to what it is intended to achieve, *transparent*.

A5.27 Additional legal requirements may also need to be satisfied depending on the SMP obligation in question, for example, for price controls where the NRA's market analysis must indicate that the lack of effective competition means that the operator concerned might sustain prices at an excessively high level, or apply a price squeeze, to the detriment of end users. In that instance, NRAs must take into account the investment made by the operator and allow him a reasonable rate of return on adequate capital employed, taking into account the risks involved, as well as ensure that any cost recovery mechanism or pricing methodology that is mandated serves to promote efficiency and sustainable competition and maximise consumer benefits. Where an obligation to provide third parties with network access is considered appropriate, NRAs must take into account factors including the feasibility of the proposed network access, the technical and economic viability of creating networks that would make the network access unnecessary and the investment of the network operator who is required to provide access.

A5.28 To the extent relevant to this review, we demonstrate the application of these requirements to the SMP obligations in question at Sections 6 to 9 of this document. In doing so, we also set our assessment of how, in our opinion, the performance of our general duties under section 3 of the Act is secured or furthered by our regulatory intervention, and that it is in accordance with the six Community requirements in section 4 of the Act. This assessment is also relevant to our assessment of the likely impact of implementing our proposals. A number of specific points should be noted in this regard.

Ofcom's general duties – section 3 of the Act

A5.29 Under the Act, our principal duty in carrying out functions is to further the interests of citizens in relation to communications matters and to further the interests of consumers in relevant markets, where appropriate by promoting competition.

A5.30 In so doing, we are required to secure a number of specific objectives and to have regard to a number of matters set out in section 3 of the Act. As to the prescribed specific statutory objectives in section 3(2), we consider that the objective of securing the availability throughout the UK of a wide range of electronic communications services as particularly relevant to this review.

A5.31 In performing our duties, we are also required to have regard to a range of other considerations, as appear to us to be relevant in the circumstances. In this context, we consider that a number of such considerations are relevant, namely:

- the desirability of promoting competition in relevant markets;
- the desirability of encouraging investment and innovation in relevant markets; and
- the desirability of encouraging the availability and use of high speed data transfer services throughout the United Kingdom.

A5.32 We have also had regard to the principles under which regulatory activities should be transparent, accountable, proportionate, consistent, and targeted only at cases in which action is needed, as well as the interest of consumers in respect of choice, price, quality of service and value for money.

A5.33 Ofcom has, however, a wide measure of discretion in balancing its statutory duties and objectives. In so doing, we have taken account of all relevant considerations, including responses received during our consultation process, in reaching our conclusions.

European Community requirements for regulation – section 4 of the Act

A5.34 As noted above, our functions exercised in this review fall under the CRF. As such, section 4 of the Act requires us to act in accordance with the six European Community requirements for regulation.

A5.35 In summary, these six requirements are:

- to promote competition in the provision of electronic communications networks and services, associated facilities and the supply of directories;
- to contribute to the development of the European internal market;

- to promote the interests of all persons who are citizens of the European Union;

- to take account of the desirability of Ofcom's carrying out of its functions in a manner which, so far as practicable, does not favour one form of or means of providing electronic communications networks, services or associated facilities over another, i.e., to be technologically neutral;

- to encourage, to such extent as Ofcom considers appropriate for certain prescribed purposes, the provision of network access and service interoperability, namely securing efficient and sustainable competition and the maximum benefit for customers of communications providers;

- to encourage compliance with certain standards in order to facilitate service interoperability and secure freedom of choice for the customers of communications providers.

A5.36 We consider that the first, third, fourth and fifth of those requirements are of particular relevance to the matters under review and that no conflict arises in this regard with those specific objectives in section 3 that we consider are particularly relevant in this context.

Impact assessment – section 7 of the Act

A5.37 The analysis presented in the whole of this document represents an impact assessment, as defined in section 7 of the Act.

A5.38 Impact assessments provide a valuable way of assessing different options for regulation and showing why the preferred option was chosen. They form part of best practice policy-making. This is reflected in section 7 of the Act, which means that generally Ofcom has to carry out impact assessments where its proposals would be likely to have a significant effect on businesses or the general public, or when there is a major change in Ofcom's activities. However, as a matter of policy Ofcom is committed to carrying out and publishing impact assessments in relation to the great majority of its policy decisions. For further information about Ofcom's approach to impact assessments, see the guidelines, Better policy-making: Ofcom's approach to impact assessment, which are on the Ofcom website: http://www.ofcom.org.uk/consult/policy_making/guidelines.pdf

A5.39 Specifically, pursuant to section 7, an impact assessment must set out how, in our opinion, the performance of our general duties (within the meaning of section 3 of the Act) is secured or furthered by or in relation to what we propose.

A5.40 Ofcom is separately required by statute to assess the potential impact of all our functions, policies, projects and practices on race, disability and gender equality. Equality impact assessments (EIAs) also assist us in making sure that we are meeting our principal duty of furthering the interests of citizens and consumers regardless of their background or identity. Unless we otherwise state in this document, it is not apparent to us that the outcome of our review is likely to have any particular impact on race, disability and gender equality. Specifically, we do not envisage the impact of any outcome to be to the detriment of any group of society.

A5.41 Nor are we envisaging any need to carry out separate EIAs in relation to race or gender equality or equality schemes under the Northern Ireland and Disability Equality Schemes. This is because we anticipate that our regulatory intervention will

affect all industry stakeholders equally and therefore not have a differential impact in relation to people of different gender or ethnicity, on consumers in Northern Ireland or on disabled consumers compared to consumers in general. Similarly, we are not envisaging making a distinction between consumers in different parts of the UK or between consumers on low incomes. Again, we believe that our intervention will not have a particular effect on one group of consumers over another.

Regulated entity

A5.42 The power in the Act to impose an SMP obligation by means of an SMP services condition provides that it is to be applied only to a 'person' whom we have determined to be a 'person' having SMP in a specific market for electronic communications networks, electronic communications services or associated facilities (i.e., the 'services market').

A5.43 The Framework Directive requires that, where an NRA determines that a relevant market is not effectively competitive, it shall identify 'undertakings' with SMP on that market and impose appropriate specific regulatory obligations. For the purposes of EC competition law, 'undertaking' includes companies within the same corporate group (*Viho v Commission* Case C-73/95 P [1996] ECR I-5447), for example, where a company within that group is not independent in its decision making.

A5.44 We consider it appropriate to prevent a dominant provider to whom a SMP service condition is applied, which is part of a group of companies, exploiting the principle of corporate separation. The dominant provider should not use another member of its group to carry out activities or to fail to comply with a condition, which would otherwise render the dominant provider in breach of its obligations.

A5.45 Accordingly, we are seeking to apply the proposed SMP conditions as relevant to BT and KCOM and we have defined each company as including any of its subsidiaries or holding companies, or any subsidiary of such holding companies (as defined by section of 1159 of the Companies Act 2006).

Annex 6

Legal Instrument

NOTIFICATION UNDER SECTIONS 48(2) AND 80 OF THE COMMUNICATIONS ACT 2003

Proposals for identifying markets, making market power determinations and the setting of SMP services conditions to be applied to BT and KCOM under section 45 of the Communications Act 2003

Background

1. On 16 December 2004, the Office of Communications ("Ofcom") published a statement entitled *Review of the wholesale local access market – Identification and analysis of markets, determination of market power and setting of SMP conditions – Explanatory statement and notification*[112] (the **"2004 Notification"**) identifying the services markets of wholesale local access services, making market power determinations and setting SMP services conditions applying to BT and KCOM.

2. On 22 July 2004, Ofcom published a statement entitled *The regulatory financial reporting obligations on BT and Kingston Communications Final statement and notification*[113] (the **"2004 Regulatory Accounting Notification"**) imposing various regulatory financial reporting obligations on BT and KCOM (as amended).

3. On 30 November 2005, Ofcom published a statement entitled *Local loop unbundling setting the fully unbundled rental charge ceiling and minor amendment to SMP conditions FA6 and FB6*[114] setting and amending further SMP obligations on BT and KCOM. On 20 March 2008, Ofcom published a statement entitled *Service level guarantees: incentivising performance*[115], giving a Direction to BT requiring it to make amendments in relation to Service Level Guarantees for Local Loop Unbundling Services.

4. On 22 May 2009, Ofcom published a statement entitled *A new pricing framework for Openreach*[116] setting SMP Condition FA3(A), which imposed charge controls on BT in respect of products/services falling within the market identified in the 2004 Notification and withdrew certain SMP obligations (the **"2009 Notification"**).

Proposals for services market identifications and market power determinations

---

[112] *Review of the wholesale local access market*,16 December 2004 (http://www.ofcom.org.uk/consult/condocs/rwlam/statement/rwlam161204.pdf)
[113] *The regulatory financial reporting obligations on BT and Kingston Communications Final statement and notification*, 22 July 2004 (http://www.ofcom.org.uk/consult/condocs/fin_reporting/fin_report_statement/finance_report.pdf)
[114] *Local loop unbundling setting the fully unbundled rental charge ceiling and minor amendment to SMP conditions FA6 and FB6,* 30 November 2005, http://www.ofcom.org.uk/consult/condocs/llu/statement/llu_statement.pdf
[115] *Service level guarantees: incentivising performance,* 20 March 2008, http://www.ofcom.org.uk/consult/condocs/slg/statement/statement.pdf
[116] *A new pricing framework for Openreach*, 22 May 2009 (http://www.ofcom.org.uk/consult/condocs/openreachframework/statement/statement.pdf and http://www.ofcom.org.uk/consult/condocs/openreachframework/statement/annexes.pdf

5. Ofcom hereby makes the following proposals for identifying markets, making market power determinations and the setting of SMP services conditions by reference to such determinations ("SMP service conditions").

6. Ofcom is proposing, in accordance with section 80 of the Act, to identify the following markets for the purpose of making market power determinations:

(a) wholesale local access services within the United Kingdom, but not including the Hull Area; and

(b) wholesale local access services within the Hull Area.

7. Ofcom is proposing, in accordance with section 80 of the Act, to make market power determinations that the following persons have significant market power:

(a) in relation to the market set out in paragraph 6(a) above, BT; and

(b) in relation to the market set out in paragraph 6(b) above, KCOM.

8. The effect of, and Ofcom's reasons for making, the proposals to identify the markets set out in paragraph 6(a) above and to make the market power determinations set out in paragraph 7(a) above are contained in Sections 3 and 4 of the consultation document accompanying this Notification.

9. The effect of, and Ofcom's reasons for making, the proposals to identify the markets set out in paragraph 6(b) above and to make the market power determinations set out in paragraph 7(b) above are contained in Sections 3 and 4 of the consultation document statement accompanying this Notification.

Proposals to set SMP service conditions

10. Ofcom is proposing, in accordance with section 48(2) of the Act, to set SMP conditions on the persons referred to in paragraphs 7(a) and (b) above as set out in Schedules 1 and 2, respectively, to this Notification.

11. The effect of, and Ofcom's reasons for making, the proposals to set those SMP conditions are contained in Sections 6 to 9 of the consultation document accompanying this Notification.

Proposals to modify SMP service conditions

12. Ofcom is proposing, in accordance with section 48(2) of the Act, to make a minor modification to SMP Condition FA3(A) to ensure that it cross-references to the proposed new SMP condition concerning basis of charges (see paragraph 10 above) in light of our proposed revocation of the existing SMP Condition FA3 (see paragraph 15 below). Accordingly, in paragraph FA3(A).1 of SMP Condition FA3(A) as set out in Schedule 1 to the 2009 Notification, for the reference to Condition FA3, there shall be substituted the reference to Condition FAA4, and Condition FA3(A) shall be read accordingly.

13. Ofcom is also proposing, in accordance with section 48(2) of the Act, to modify Annex 2 to the 2004 Regulatory Accounting Notification by:

(a) modifying paragraph 4.a.i. to insert the words "and 18" after "14 to 17a";

(b) modifying the table in Schedule 1 (entitled "Part 1: Wholesale Markets") to insert a new row at the end of the table, with the first column to read "18. wholesale local access services within the UK, but not including the Hull Area" and, for the second column, to insert the date of the final statement on the proposals relating to that market; and

(c) making a minor modification to Schedule 2, amending SMP Condition OA2 in light of our proposed revocation of SMP Condition FA10 (see paragraph 15 below) so that Directions given under Condition FA10.2 are retained, as set out in Schedule 3 to this Notification.

14. The effect of, and Ofcom's reasons for making, these proposals are contained in Sections 6 to 9 of the consultation document accompanying this Notification.

Proposals to revoke SMP service conditions

15. Ofcom is proposing, in accordance with section 48(2) of the Act, to revoke the following conditions:

(a) all of the SMP conditions (as modified)[117] set out in Schedule 1 to the 2004 Notification, with the exception of Condition FA3(A); and

(b) all of the SMP conditions (as modified)[118] set out in Schedule 2 to the 2004 Notification.

Ofcom's duties and legal tests

16. In identifying and analysing the markets referred to in this Notification, and in considering whether to make the corresponding proposals, Ofcom has, in accordance with section 79 of the Act, taken due account of all applicable guidelines and recommendations which have been issued or made by the European Commission in pursuance of a Community instrument, and relate to market identification and analysis or the determination of what constitutes significant market power.

17. Ofcom considers that the proposed SMP conditions above comply with the requirements of sections 45 to 47, 87, 88 and 90 of the Act, as appropriate and relevant to each such SMP condition, and further that the proposed modifications and revocations of the SMP conditions referred to above comply with the requirements of sections 45 to 47, 87 and 88 of the Act as appropriate and relevant to them.

18. In making all of the proposals in this Notification, Ofcom has considered and acted in accordance with section 3 of the Act and the six Community requirements in section 4 of the Act.

Making representations

19. Representations may be made to Ofcom about any of the proposals set out in this Notification and the accompanying explanatory statement by 1 June 2010.

[117] The SMP conditions set in the December 2004 review have been amended from time to time. The revocation of the substantive conditions includes any amendment that has subsequently been made to those conditions.
[118] The SMP conditions set in the December 2004 review have been amended from time to time. The revocation of the substantive conditions includes any amendment that has subsequently been made to those conditions.

20. Copies of this Notification and the accompanying explanatory statement have been sent to the Secretary of State in accordance with section 50(1)(a) of the Act, the European Commission and to the regulatory authorities of every other member State in accordance with sections 50(3) and 81 of the Act.

Interpretation

21. Save for the purposes of paragraph 6 of this Notification and except as otherwise defined in this Notification, words or expressions used shall have the same meaning as they have been ascribed in the Act.

22. In this Notification:

(a) **"2004 Notification"** has the meaning given in paragraph 1 above;

(b) **"2004 Regulatory Accounting Notification"** has the meaning given in paragraph 2 above;

(c) **"2009 Notification"** has the meaning given in paragraph 4 above;

(d) **"Act"** means the Communications Act 2003 (c. 21)

(e) **"BT"** means British Telecommunications plc, whose registered company number is 1800000, and any of its subsidiaries or holding companies, or any subsidiary of such holding companies, all as defined in section 1159 of the Companies Act 2006;

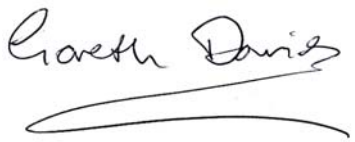
(f) **"Hull Area"** means the area defined as the 'Licensed Area' in the licence granted on 30 November 1987 by the Secretary of State under section 7 of the Telecommunications Act 1984 to Kingston upon Hull City Council and Kingston Communications (Hull) plc, (now known as KCOM);

(g) **"KCOM"** means KCOM Group plc, whose registered company number is 2150618, and any of its subsidiaries or holding companies, or any subsidiary of such holding companies, all as defined in section 1159 of the Companies Act 2006;

(h) **"Ofcom"** means the Office of Communications as established pursuant to section 1(1) of the Office of Communications Act 2002;

(i) **"United Kingdom"** has the meaning given to it in the Interpretation Act 1978 (c. 30); and

23. The Schedules to this Notification shall form part of this Notification.



GARETH DAVIES
Competition Policy Director

A person duly authorised in accordance with paragraph 18 of the Schedule to the Office of Communications Act 2002

23 March 2010

SCHEDULE 1 – BT CONDITIONS

The SMP services conditions proposed to be imposed on BT under sections 45, 87, and 88 of the Communications Act 2003 as a result of the analysis of the market set out in paragraph 6(a) of the Notification in which it is proposed that BT has significant market power ("SMP conditions")

Part 1: Application, definitions and interpretation relating to the SMP conditions in Part 2

1. The conditions in Part 2 of this Schedule 1 shall apply to the market identified at paragraph 6(a) of this Notification.

2. In this Schedule:

(a) "Access Charge Change Notice" has the meaning given to it in Condition FAA6.2;

(b) "Access Contract" means:

(i) a contract for the provision by the Dominant Provider to another person of Network Access to the Dominant Provider's Electronic Communications Network;

(ii) a contract under which Associated Facilities in relation to the Dominant Provider's Public Electronic Communications Network are made available by the Dominant Provider to another person;

(c) "Act" means the Communications Act 2003 (c. 21);

(d) "Dominant Provider" means British Telecommunications plc, whose registered company number is 1800000, and any British Telecommunications plc subsidiary or holding company, or any of its subsidiaries or holding companies, or any subsidiary of such holding companies, all as defined in section 1159 of the Companies Act 2006;

(e) "Hull Area" means the area defined as the Licensed Area in the licence granted on 30 November 1987 by the Secretary of State under section 7 of the Telecommunications Act 1984 to Kingston upon Hull City Council and Kingston Communications plc (now known as KCOM);

(f) "MDF Site" has the meaning given to it in Condition FAA9;

(g) "Metallic Path Facilities" has the meaning given to it in Condition FAA9;

(h) "Network Component" means, to the extent they are used in the market identified at paragraph 6(a) of this Notification, the network components specified in any direction given by Ofcom from time to time for the purpose of these Conditions;

(i) "Ofcom" means the Office of Communications as established pursuant to section 1(1) of the Office of Communications Act 2002;

(j) "Reference Offer" means the terms and conditions on which the Dominant Provider is willing to enter into an Access Contract;

(k) "Third Party" means either:

(i) a person providing a Public Electronic Communications Network; or

(ii) a person providing a Public Electronic Communications Service;

(l) "Transfer Charge" means the charge or price that is applied, or deemed to be applied, by the Dominant Provider to itself for the use or provision of an activity or group of activities. For the avoidance of doubt such activities or group of activities include, amongst other things, products and services provided from, to or within the market identified at paragraph 6(a) of this Notification and the use of Network Components in that market;

(m) "Usage Factor" means the average usage by any Communications Provider (including the Dominant Provider itself) of each Network Component in using or providing a particular product or service or carrying out a particular activity; and

(n) "Virtual Unbundled Local Access" has the meaning given to it in Condition FAA11.

3. For the purpose of interpreting the SMP conditions in Part 2:

(a) except in so far as the context otherwise requires, words or expressions shall have the meaning assigned to them in paragraph 2 of this Part above and otherwise any word or expression shall have the same meaning as it has in the Act;

(b) the Interpretation Act 1978 (c. 30) shall apply as if each of the SMP conditions in Part 2 were an Act of Parliament; and

(c) headings and titles shall be disregarded.

PART 2: The SMP conditions

Condition FAA1 - Requirement to provide Network Access on reasonable request

FAA1.1 Where a Third Party reasonably requests in writing Network Access, the Dominant Provider shall provide that Network Access. The Dominant Provider shall also provide such Network Access as Ofcom may from time to time direct.

FAA1.2 The provision of Network Access in accordance with paragraph FAA1.1 above shall occur as soon as it is reasonably practicable and shall be provided on fair and reasonable terms, conditions and charges and on such terms, conditions and charges as Ofcom may from time to time direct.

FAA1.3 The Dominant Provider shall comply with any direction Ofcom may make from time to time under this Condition.

FAA1.4 The Direction dated 20 March 2008 concerning service level agreements, as published on the same day at Annex 2 of the statement entitled '*Service level guarantees: incentivising performance*', given by Ofcom under Condition FA1.2 shall continue to have force, until such time it is modified or withdrawn, as if it has been given under Condition FAA1.2 from the date that this Condition enters into force and that Direction shall be read accordingly.

Condition FAA2 – Requests for new Network Access

FAA2.1 The Dominant Provider shall, for the purposes of transparency, publish reasonable guidelines, in relation to requests for new Network Access made to it. Such guidelines shall detail:

(a) the form in which such a request should be made;

(b) the information that the Dominant Provider requires in order to consider a request for new Network Access; and

(c) the time-scales in which such requests will be handled by the Dominant Provider.

FAA2.2 These guidelines shall meet the following principles:

(a) the process should be documented end-to-end;

(b) the timescales for each stage of the process shall be reasonable;

(c) the criteria by which requests will be assessed shall be clearly identified; and

(d) any changes to the guidelines be agreed between the Dominant Provider and industry.

FAA2.3 The Dominant Provider shall, upon a reasonable request from a Third Party considering making a request for new Network Access, provide that Third Party with information so as to enable that Third Party to make a request for new Network Access. Such information shall be provided within a reasonable period.

FAA2.4 On receipt of a written request for new Network Access, the Dominant Provider shall deal with the request in accordance with the guidelines described at paragraph FAA2.1 above. A modification of a request for new Network Access which has previously been submitted to the Dominant Provider, and rejected by the Dominant Provider, shall be considered as a new request.

FAA2.5 The Dominant Provider is required to provide Ofcom with a description of the processes it has put in place to ensure compliance with this Condition. The Dominant Provider shall keep those processes under review to ensure that they remain adequate for that purpose. Where changes to the process are agreed with industry, the Dominant Provider should notify Ofcom of those changes.

Condition FAA3 – Requirement not to unduly discriminate

FAA3.1 The Dominant Provider shall not unduly discriminate against particular persons or against a particular description of persons, in relation to matters connected with Network Access.

FAA3.2 In this Condition, the Dominant Provider may be deemed to have shown undue discrimination if it unfairly favours to a material extent an activity carried on by it so as to place at a competitive disadvantage persons competing with the Dominant Provider.

FAA3.3 This Condition shall not apply to the requirement on the Dominant Provider to provide Virtual Unbundled Local Access under Condition FAA11. For the avoidance of any doubt, Condition FAA11.3 contains a specific obligation of non-discrimination on the Dominant Provider in relation to such provision.

Condition FAA4 – Basis of charges

FAA4.1 Unless Ofcom directs otherwise from time to time, the Dominant Provider shall secure, and shall be able to demonstrate to the satisfaction of Ofcom, that each and every charge offered, payable or proposed for Network Access covered by Condition FAA1 and/or Conditions FAA9, FAA10 and FAA12 is reasonably derived from the costs of provision based on a forward looking long run incremental cost approach and allowing an appropriate mark up for the recovery of common costs including an appropriate return on capital employed.

FAA4.2 For the avoidance of any doubt:

(a) this Condition FAA4 shall not apply to the requirement on the Dominant Provider to provide Virtual Unbundled Local Access under Condition FAA11; and

(b) except for the charge for MPF Rental, where the charge offered, payable or proposed for Network Access covered by Condition FAA1 and/or Condition FAA9 is for a service which is subject to a charge control under Condition FA3(A), the Dominant Provider shall secure, and shall be able to demonstrate to the satisfaction of Ofcom, that such a charge satisfies the requirements of paragraph FAA4.1 above.

Condition FAA5 – Requirement to publish a Reference Offer

FAA5.1 Except in so far as Ofcom may otherwise consent in writing, the Dominant Provider shall publish a Reference Offer and act in the manner set out below.

FAA5.2 Subject to paragraph FAA5.10 below, the Dominant Provider shall ensure that a Reference Offer in relation to the provision of Network Access includes at least the following:

(a) a description of the Network Access to be provided, including technical characteristics (which shall include information on network configuration where necessary to make effective use of Network Access);

(b) the locations of the points of Network Access;

(c) the technical standards for Network Access (including any usage restrictions and other security issues);

(d) the conditions for access to ancillary, supplementary and advanced services (including operational support systems, information systems or databases for pre-ordering, provisioning, ordering, maintenance and repair requests and billing);

(e) any ordering and provisioning procedures;

(f) relevant charges, terms of payment and billing procedures;

(g) details of interoperability tests;

(h) details of traffic and network management;

(i) details of maintenance and quality as follows:
(i) specific time scales for the acceptance or refusal of a request for supply and for completion, testing and hand-over or delivery of services and facilities, for provision of support services (such as fault handling and repair);
(ii) service level commitments, namely the quality standards that each party must meet when performing its contractual obligations;
(iii) the amount of compensation payable by one party to another for failure to perform contractual commitments;
(iv) a definition and limitation of liability and indemnity; and
(v) procedures in the event of alterations being proposed to the service offerings, for example, launch of new services,
changes to existing services or change to prices;

(j) details of measures to ensure compliance with requirements for network integrity;

(k) details of any relevant intellectual property rights;

(l) a dispute resolution procedure to be used between the parties;

(m) details of duration and renegotiation of agreements;

(n) provisions regarding confidentiality of non-public parts of the agreements;

(o) rules of allocation between the parties when supply is limited (for example, for the purpose of Co-Location or location of masts);

(p) the standard terms and conditions for the provision of Network Access; and

(q) the amount applied to:
(i) each Network Component used in providing Network Access with the relevant Usage Factors;
(ii) the Transfer Charge for each Network Component or combination of Network Components described above; reconciled in each case to the charge payable by a Communications Provider other than the Dominant Provider.

FAA5.3 (LLU) Subject to paragraph FAA5.10 below, the Dominant Provider shall ensure that a Reference Offer in relation to the provision of Local Loop Unbundling Services also includes at least the following:

(a) the location of MDF Sites;

(b) the area within which Metallic Path Facilities could be made available from each of the MDF Sites listed under (a) above;

(c) the availability of Co-Location at each of the MDF Sites listed under (a) above;

(d) equipment characteristics, including any restrictions on equipment for the purposes of Co-Location at each of the MDF Sites listed under (a) above;

(e) conditions for Site Access at each of the MDF Sites listed under (a) above, including conditions for access for staff of those Third Parties to whom the Dominant Provider provides Local Loop Unbundling Services;

(f) conditions for the inspection of MDF Sites at which Co-Location is available or at which Co-Location has been refused on grounds of lack of capacity;

(g) safety standards;

(h) the relevant charges (or charging formulae) for each feature, function and facility involved in the provision of Local Loop Unbundling Services; and

(i) anything which may reasonably be regarded as being likely to materially affect the availability of the relevant Local Loop Unbundling Services.

FAA5.3 (PIA) Subject to paragraph FAA5.10 below, the Dominant Provider shall ensure that a Reference Offer in relation to the provision of Physical Infrastructure Access also includes at least the following:

(a) the location of Physical Infrastructure or the method by which Third Parties may obtain information about the location of Physical Infrastructure;

(b) technical specifications for Physical Infrastructure Access including:

(i) technical specifications for permitted cables and associated equipment; and

(ii) cable installation, attachment and recovery methods.

(c) the methodology for calculating availability of spare capacity in Physical Infrastructure;

(d) procedures for the provision of information to Third Parties about spare capacity, including arrangements for visual surveys of Physical Infrastructure to determine spare capacity;

(e) conditions for reserving capacity that shall apply equally to BT and other CPs;

(f) conditions for the installation and recovery of cables and associated equipment;

(g) arrangements for relieving congested Physical Infrastructure, including the repair of existing faulty infrastructure and the construction of new Physical Infrastructure;

(h) a procedure for the Dominant Provider to announce plans reasonably in advance for new construction of Physical Infrastructure such that Third Parties may request BT to install additional capacity for those Third Parties;

(i) conditions for Third Parties to gain access to the Physical Infrastructure including if appropriate training, certification and authorisation requirements for personnel permitted to access and work in/on Physical Infrastructure;

(j) the arrangements for maintenance of cables and associated equipment installed by Third Parties and of the Physical Infrastructure, including provision for the temporary occupation of additional infrastructure capacity for the installation of replacement cables;

(k) conditions for the inspection of the Physical Infrastructure at which access is available or at which access has been refused on grounds of lack of capacity;

(l) anything which may reasonably be regarded as being likely to materially affect the availability of the relevant Physical Infrastructure Access.

FAA5.4 To the extent that the Dominant Provider provides to itself Network Access that:

(a) is the same, similar or equivalent to that provided to any other person; or

(b) may be used for a purpose that is the same, similar or equivalent to that provided to any other person,

in a manner that differs from that detailed in a Reference Offer in relation to Network Access provided to any other person, the Dominant Provider shall ensure that it publishes a Reference Offer in relation to the Network Access that it provides to itself which includes, where relevant, at least those matters detailed in paragraphs FAA5.2(a)-(q).

FAA5.5A The Dominant Provider shall, within one month of the date that this Condition enters into force, publish a Reference Offer in relation to any Network Access that it is providing as at the date that this Condition enters into force.

FAA5.5B The Dominant Provider shall within three months of the date that this Condition enters into force, publish a Reference Offer for Physical Infrastructure Access that at minimum includes access to ducts and chambers and within six months of the date that this Condition enters into force publish a Reference Offer for Physical Infrastructure Access that includes access to poles.

FAA5.6 The Dominant Provider shall update and publish the Reference Offer in relation to any amendments or in relation to any further Network Access provided after the date that this Condition enters into force.

FAA5.7 Publication referred to above shall be effected by:

(a) placing a copy of the Reference Offer on any relevant website operated or controlled by the Dominant Provider; and

(b) sending a copy of the Reference Offer to Ofcom.

FAA5.8 The Dominant Provider shall give Ofcom at least ten days prior written notice of any amendment to the Reference Offer coming into effect, unless such amendment is directed or determined by Ofcom or is required by a notification or enforcement notification issued by Ofcom under sections 94 or 95 of the Act.

FAA5.9 The Dominant Provider shall send a copy of the current version of the Reference Offer to any person at that person's written request (or such parts which have been requested). The provision of such a copy of the Reference Offer may be subject to a reasonable charge.

FAA5.10 The Dominant Provider shall make such modifications to the Reference Offer as Ofcom may direct from time to time.

FAA5.11 The Dominant Provider shall provide Network Access at the charges, terms and conditions in the relevant Reference Offer and shall not depart therefrom either directly or indirectly.

FAA5.12 The Dominant Provider shall comply with any direction Ofcom may make from time to time under this Condition.

FAA5.13 In this Condition:

(a) references to the expressions **"Co-Location"** and **"Site Access"** are references to those expressions as defined for the purposes of Conditions FAA9, FAA11 and FAA12 as relevant to the Network Access in question in this Condition;

(b) **"Local Loop Unbundling Services"** has the meaning given to it in Condition FAA9;

(c) **"Physical Infrastructure"** has the meaning given to it in Condition FAA12; and

(d) **"Physical Infrastructure Access"** has the meaning given to it in Condition FAA12.

Condition FAA6 – Requirement to notify charges, terms and conditions

FAA6.1 Except in so far as Ofcom may otherwise consent in writing, the Dominant Provider shall publish charges, terms and conditions and act in the manner set out below.

FAA6.2 Save where otherwise provided in Condition FAA6, the Dominant Provider shall send to Ofcom and to every person with which it has entered into an Access Contract covered by Condition FAA1 and/or Conditions FAA9 to FAA12 a written notice of any amendment to the charges, terms and conditions on which it provides Network Access or in relation to any charges, terms and conditions for new Network Access (an **"Access Charge Change Notice"**) not less than 90 days before any such amendment comes into effect for existing Network Access, or not less than 28 days before any such charges, terms and conditions come into effect for new Network Access provided after the date that this Condition enters into force. This obligation for prior notification will not apply where the new or amended charges or terms and conditions are directed or determined by Ofcom or are required by a notification or enforcement notification issued by Ofcom under sections 94 or 95 of the Act.

FAA6.3 The Dominant Provider shall ensure that an Access Charge Change Notice includes:

(a) a description of the Network Access in question;

(b) a reference to the location in the Dominant Provider's current Reference Offer of the charges, terms and conditions associated with the provision of that Network Access;

(c) the date on which or the period for which any amendments to charges, terms and conditions will take effect (the "effective date");

(d) the current and proposed new charge and the relevant Usage Factors applied to each Network Component comprised in that Network Access, reconciled in each case with the current or proposed new charge; and

(e) the information specified in sub paragraph (d) above with respect to that Network Access to which that paragraph applies.

FAA6.4 The Dominant Provider shall not apply any new charge, term and condition identified in an Access Charge Change Notice before the effective date.

FAA6.5 To the extent that the Dominant Provider provides to itself Network Access that:

(a) is the same, similar or equivalent to that provided to any other person; or

(b) may be used for a purpose that is the same, similar or equivalent to that provided to any other person, in a manner that differs from that detailed in an Access Charge Change Notice in relation to Network Access provided to any other person,

the Dominant Provider shall ensure that it sends to Ofcom an Access Charge Change Notice in relation to the Network Access that it provides to itself which includes, where relevant, at least those matters detailed in paragraphs FAA6.3(a)-(e).

Condition FAA7 – Requirement to notify technical information

FAA7.1 Save where Ofcom consents otherwise, where the Dominant Provider:

(a) proposes to provide Network Access covered by Condition FAA1 and/or Conditions FAA9 to FAA12, the terms and conditions for which comprise new:
(i) technical characteristics (including information on network configuration where necessary to make effective use of the Network Access);
(ii) locations of the points of Network Access; or
(iii) technical standards (including any usage restrictions and other security issues), or

(b) proposes to amend an existing Access Contract covered by Condition FAA1 and/or Conditions FAA9 to FAA12 by modifying the terms and conditions listed in paragraph 1(a)(i) to (iii) on which the Network Access is provided,

the Dominant Provider shall publish a written notice (the **"Notice"**) of the new or amended terms and conditions within a reasonable time period, but not less than 90 days before either the Dominant Provider enters into an Access Contract to provide the new Network Access or the amended terms and conditions of the existing Access Contract come into effect. This obligation for prior notification will not apply where the new or amended charges or terms and conditions are directed or determined by Ofcom or are required by a notification or enforcement notification issued by Ofcom under sections 94 or 95 of the Act. This obligation for prior notification will also not apply in relation to new or amended technical specifications determined by NICC Standards Limited (namely, the private limited company NICC Standards Limited, whose registered company number is 6613589).

FAA7.2 The Dominant Provider shall ensure that the Notice includes:

(a) a description of the Network Access in question;

(b) a reference to the location in the Dominant Provider's Reference Offer of the relevant terms and conditions; and

(c) the date on which or the period for which the Dominant Provider may enter into an Access Contract to provide the new Network Access or any amendments to the relevant terms and conditions will take effect (the "effective date").

FAA7.3 The Dominant Provider shall not enter into an Access Contract containing the terms and conditions identified in the Notice or apply any new relevant terms and conditions identified in the Notice before the effective date.

FAA7.4 Publication referred to in paragraph FAA7.1 shall be effected by:

(a) placing a copy of the Notice on any relevant website operated or controlled by the Dominant Provider;

(b) sending a copy of the Notice to Ofcom; and

(c) sending a copy of the Notice to any person at that person's written request, and where the Notice identifies a modification to existing relevant terms and conditions, to every person with which the Dominant Provider has entered into an Access Contract covered by FAA1 and/or Conditions FAA9 to FAA12. The provision of such a copy of Notice may be subject to a reasonable charge.

Condition FAA8 – Quality of service

FAA8.1 The Dominant Provider shall publish all such information for the purposes of securing transparency as to the quality of service in relation to Network Access provided by the Dominant Provider in such manner and form as Ofcom may from time to time direct.

FAA8.2 The Dominant Provider shall comply with any direction Ofcom may make from time to time under this Condition.

Condition FAA9 – Requirement to provide Local Loop Unbundling Services (LLU)

FAA9.1 Where a Third Party reasonably requests in writing Local Loop Unbundling Services, the Dominant Provider shall provide those Services, which shall include, where also so requested by the Third Party, such Ancillary Services as may be reasonably necessary for the use of those Services. The Dominant Provider shall also provide such Ancillary Services or other Network Access as Ofcom may from time to time direct to ensure the provision of Local Loop Unbundling Services.

FAA9.2 The provision of Local Loop Unbundling Services, together with any Ancillary Services, in accordance with paragraph FAA9.1 shall occur as soon as reasonably practicable and shall be provided on fair and reasonable terms, conditions and charges and on such terms, conditions and charges as Ofcom may direct from time to time.

FAA9.3 The Dominant Provider shall comply with any direction Ofcom may make from time to time under this Condition.

FAA9.4 In this Condition:

(a) "Ancillary Services" mean an Associated Facility or services associated with an Electronic Communications Network and/or an Electronic Communications Service which enable and/or support the provision of services via that Network and/or Service or have the potential to do so, which include at a minimum (but without limitation) the following:

(i) power;

(ii) Co-Location;

(iii) Co-Mingling;

(iv) Site Access;

(v) Internal Tie Circuits;

(vi) External Tie Circuits.

(b) "Co-Location" means the provision of space permitting a Third Party to occupy part of an MDF Site reasonably sufficient to permit the use of Local Loop Unbundling Services, and in particular to permit the connection of the Dominant Provider's Electronic Communications Network with the Electronic Communications Network of a Third Party at that location;

(c) "Co-Mingling" means the provision of Co-Location having the following characteristics:

(i) the Third Party's Electronic Communications Network is situated in an area of the MDF Site which:

(A) is a single undivided space;

(B) after proper performance by the Dominant Provider of its obligation to provide Local Loop Unbundling Services pursuant to Condition FAA10.1, would permit the normal operation of the Third Party's Electronic Communications Network (or would permit if the Dominant Provider removed any object or substance whether toxic or not, which might reasonably prevent or hinder the occupation of the MDF Site for such use); and

(C) if so requested by the Third Party, is not unreasonably distant from the Dominant Provider's Electronic Communications Network within the MDF site;

(ii) no permanent physical partition is erected in the space between the Third Party's Electronic Communications Network and the Dominant Provider's Electronic Communications Network; and

(iii) the Third Party's Electronic Communications Network is neither owned nor run by the Dominant Provider or by any person acting on the Dominant Provider's behalf;

(d) "External Tie Circuit" means a link that connects Local Loop Unbundling Services to the Electronic Communications Network of a Third Party at a location outside the MDF Site;

(e) "Internal Tie Circuit" means a link, the whole of which is contained within an MDF Site, that connects Local Loop Unbundling Services to the Electronic Communications Network of a Third Party;

(f) "Local Loop Unbundling Services" mean Network Access to Metallic Path Facilities or Shared Access;

(g) "MDF Site" means the site of an operational building of the Dominant Provider that houses a main distribution frame;

(h) "Metallic Path Facilities" means a circuit comprising a pair of twisted metal wires employing electric, magnetic, electro-magnetic, electro-chemical or electro-mechanical energy to convey Signals when connected to an Electronic Communications Network;

(i) "Shared Access" means the non-voice band frequency of Metallic Path Facilities;

(j) "Site Access" means access (including the right of entry) to the Dominant Provider's MDF Sites in order to install and operate an Electronic Communications Network to provide Electronic Communications Services over Local Loop Unbundling Services; and

(k) references to the expression Electronic Communications Network for the purposes of the expressions Co-Location, Co-Mingling and Site Access in this Condition shall be limited to those matters set out at section 32(1)(b)(i)-(iii) of the Act.

Condition FAA10 – Requirement to provide Sub-Loop Unbundling Services (SLU)

FAA10.1 Where a Third Party reasonably requests in writing Sub-Loop Unbundling Services, the Dominant Provider shall provide those Services, which shall include, where also so requested by the Third Party, such Ancillary Services as may be reasonably necessary for the use of those Services. The Dominant Provider shall also provide such Ancillary Services or other Network Access as Ofcom may from time to time direct to ensure the provision of Sub-Loop Unbundling Services.

FAA10.2 The provision of Sub-Loop Unbundling Services, together with any Ancillary Services, in accordance with paragraph FAA10.1 shall occur as soon as reasonably practicable and shall be provided on fair and reasonable terms, conditions and charges and on such terms, conditions and charges as Ofcom may direct from time to time.

FAA10.3 The Dominant Provider shall comply with any direction Ofcom may make from time to time under this Condition.

FAA10.4 In this Condition:

(a) "Ancillary Services" mean an Associated Facility or services associated with an Electronic Communications Network and/or an Electronic Communications Service which enable and/or support the provision of services via that Network and/or Service or have the potential to do so, which include at a minimum (but without limitation) Tie Circuit.

(b) "Shared Access" has the meaning given to it in Condition FAA9;

(c) "Sub-Loop Unbundling Services" means access to Metallic Path Facilities or Shared Access at an intermediate point prior to the main distribution frame;

(d) "Tie Circuit" means a link that connects Sub-Loop Unbundling Services to the Electronic Communications Network of a Third Party; and

(e) references to the expression Electronic Communications Network for the purposes of the expression Ancillary Services in this Condition shall be limited to those matters set out at section 32(1)(b)(i)-(iii) of the Act.

Condition FAA11 – Requirement to provide Virtual Unbundled Local Access (VULA)

FAA11.1 Where a Third Party reasonably requests in writing Virtual Unbundled Local Access, the Dominant Provider shall provide that Access, which shall include, where also so requested by the Third Party, such Ancillary Services as may be reasonably necessary for the use of that Access. The Dominant Provider shall also provide such Ancillary Services or other Network Access as Ofcom may from time to time direct to ensure the provision of Virtual Unbundled Local Access.

FAA11.2 The provision of Virtual Unbundled Local Access, together with any Ancillary Services, in accordance with paragraph FAA11.1 shall occur as soon as reasonably practicable and shall be provided on fair and reasonable terms, conditions and charges and on such terms, conditions and charges as Ofcom may direct from time to time.

FAA11.3 Without prejudice to the generality of the provision in Condition FAA11.2, the provision of Virtual Unbundled Local Access, with or without any Ancillary Services, in accordance with paragraph FAA11.1 shall be provided to a Third Party on an Equivalence of Inputs basis. Where the Dominant Provider provides (or seeks to provide) Virtual Unbundled Local Access, with or without any Ancillary Services, for its own services (including for those of its subsidiaries or partners), the Dominant Provider shall not so provide, unless at the same time the Dominant Provider provides and/or offers to provide such Access to Third Parties on an Equivalence of Inputs basis.

FAA11.4 The Dominant Provider shall comply with any direction Ofcom may make from time to time under this Condition.

FAA11.5 In this Condition:

(a) "Ancillary Services" mean an Associated Facility or services associated with an Electronic Communications Network and/or an Electronic Communications Service which enable and/or support the provision of services via that Network and/or Service or have the potential to do so, which include at a minimum (but without limitation) the following:

(i) power;

(ii) Co-Location;

(iii) Co-Mingling;

(iv) Site Access;

(b) "Co-Location" means the provision of space permitting a Third Party to occupy part of a Local Serving Exchange reasonably sufficient to permit the use of Virtual Unbundled Local Access, and in particular to permit the connection of the Dominant Provider's Electronic Communications Network with the Electronic Communications Network of a Third Party at that location;

(c) "Co-Mingling" means the provision of Co-Location having the following characteristics:

(i) the Third Party's Electronic Communications Network is situated in an area of the Local Serving Exchange which:

(A) is a single undivided space;

(B) after proper performance by the Dominant Provider of its obligation to provide Virtual Unbundled Local Access pursuant to Condition FAA11.1, would permit the normal operation of the Third Party's Electronic Communications Network (or would permit if the Dominant Provider removed any object or substance whether toxic or not, which might reasonably prevent or hinder the occupation of the Local Serving Exchange for such use); and

(C) if so requested by the Third Party, is not unreasonably distant from the Dominant Provider's Electronic Communications Network within the Local Serving Exchange;

(ii) no permanent physical partition is erected in the space between the Third Party's Electronic Communications Network and the Dominant Provider's Electronic Communications Network; and

(iii) the Third Party's Electronic Communications Network is neither owned nor run by the Dominant Provider or by any person acting on the Dominant Provider's behalf;

(d) "Commercial Information" means all information, including information of a commercially confidential nature, relating to the provision of Virtual Unbundled Local Access concerning the following:

(i) product development;

(ii) pricing;

(iii) marketing strategy and intelligence;

(iv) product launch dates;

(v) cost;

(vi) projected sales volumes; and

(vii) network coverage and capabilities

unless Ofcom consents otherwise from time to time.

(e) "Equivalence of Inputs" means, unless Ofcom consents otherwise from time to time, the provision on the same timescales, terms and conditions (including price and service levels) by means of the same systems and processes and with the same Commercial Information as the Dominant Provider provides for its own services (including for those of its subsidiaries or partners). The Dominant Provider may be deemed to place itself at a competitive advantage and not to provide on an Equivalence of Inputs basis, unless the provision is exactly the same subject only to: (i) trivial differences; and (ii) differences relating to credit vetting procedures, payment procedures, matters of national and crime-related security, physical security, security required to protect the operational integrity of the network, provisions relating to the termination of a contract, or contractual provisions relating to requirements for a safe working environment. For the avoidance of any doubt, the Dominant Provider may not show any other reasons in seeking to objectively justify the provision in a different manner.

(f)"Local Serving Exchange" means the site of an operational building of the Dominant Provider, where Interconnection is made available by the Dominant Provider to a Third Party for Network Termination Points served by that site for the provision of Virtual Unbundled Local Access;

(g) "Network Termination Point" means the physical point at which a Relevant Subscriber is provided with access to a Public Electronic Communications Network;

(h) "Point of Connection" means a point at which the Dominant Provider's Electronic Communications Network and another person's Electronic Communications Network are connected;

(i) "Relevant Subscriber" means any person who is party to a contract with a provider of Public Electronic Communications Services for the supply of such Services;

(j) "Site Access" means access (including the right of entry) to the Dominant Provider's Local Serving Exchange in order to install and operate an Electronic Communications Network to provide Electronic Communications Services over the Virtual Unbundled Local Access;

(k) "Virtual Unbundled Local Access" means Network Access comprising of a virtual circuit between a Point of Connection at the Local Serving Exchange and a Network Termination Point, which circuit provides such specified capacity as is agreed between the Dominant Provider and the Third Party for the Third Party's exclusive use; and

(l) references to the expression Electronic Communications Network for the purposes of the expressions Co-Location, Co-Mingling and Site Access in this Condition shall be limited to those matters set out at section 32(1)(b)(i)-(iii) of the Act.

Condition FAA12 – Requirement to provide Physical Infrastructure Access (PIA)

FAA12.1 Where a Third Party reasonably requests in writing access to Physical Infrastructure Access, the Dominant Provider shall provide that Access, which shall include, where also so requested by the Third Party, such Ancillary Services as may be reasonably necessary for the use of that Access, if, and only if, such Access and Services are to be used by the Third Party for the purpose of deployment of broadband access networks serving multiple residential and business Customers. The Dominant Provider shall also provide such Ancillary Services or other Network Access as Ofcom may from time to time direct to ensure the provision of Virtual Unbundled Local Access.

FAA12.2 The provision of Physical Infrastructure Access, together with any Ancillary Services, in accordance with paragraph FAA12.1 shall occur as soon as reasonably practicable and shall be provided on fair and reasonable terms, conditions and charges and on such terms, conditions and charges as Ofcom may direct from time to time.

FAA12.3 The Dominant Provider shall comply with any direction Ofcom may make from time to time under this Condition.

FAA12.4 In this Condition:

(a) "Ancillary Services" mean an Associated Facility or services associated with an Electronic Communications Network and/or an Electronic Communications Service which enable and/or support the provision of services via that Network and/or Service or have the potential to do so, which include at a minimum (but without limitation) the following:

(i) power;

(ii) Co-Location;

(iii) Co-Mingling;

(iv) Site Access;

(b) "Co-Location" means the provision of space permitting a Third Party to occupy part of an MDF Site reasonably sufficient to permit the use of Physical Infrastructure Access;

(c) "Co-Mingling" means the provision of Co-Location having the following characteristics:

(i) the Third Party's Electronic Communications Network is situated in an area of the MDF Site which:

(A) is a single undivided space;

(B) after proper performance by the Dominant Provider of its obligation to provide Physical Infrastructure Access pursuant to Condition FAA12.1, would permit the normal operation of the Third Party's Electronic Communications Network (or would permit if the Dominant Provider removed any object or substance whether toxic or not, which might reasonably prevent or hinder the occupation of the MDF Site for such use); and

(C) if so requested by the Third Party, is not unreasonably distant from the Dominant Provider's Electronic Communications Network within the MDF site;

(ii) no permanent physical partition is erected in the space between the Third Party's Electronic Communications Network and the Dominant Provider's Electronic Communications Network; and

(iii) the Third Party's Electronic Communications Network is neither owned nor run by the Dominant Provider or by any person acting on the Dominant Provider's behalf;

(d) "Network Termination Point" has the meaning given to it in Condition FAA11;

(e) "Physical Infrastructure Access" means Network Access comprising predominantly of the provision of space, anchorage, attachment facilities and/or such other facilities as may be reasonably necessary to permit a Third Party to occupy parts of the Dominant Provider's Physical Infrastructure located between Network Termination Points and MDF Sites serving those Network Termination Points, sufficient to facilitate the establishment, installation, operation and maintenance of the Electronic Communications Network of a Third Party at that location;

(f) "Physical Infrastructure" includes any conduit, tunnel, subway, pipe, structure, pole or other thing in, on, by or from which an Electronic Communications Network is or may be installed, supported, carried or suspended;

(g) "Site Access" means access (including the right of entry) to the Dominant Provider's MDF Sites in order for a Third Party to install and operate an Electronic Communications Network to provide Electronic Communications Services; and

(h) references to the expression Electronic Communications Network for the purposes of the expressions Co-Location, Co-Mingling and Site Access in this Condition shall be limited to those matters set out at section 32(1)(b)(i)-(iii) of the Act.

SCHEDULE 2 – KCOM CONDITIONS

The SMP services conditions proposed to be imposed on KCOM under sections 45, 87, and 88 of the Communications Act 2003 as a result of the analysis of the market set out in paragraph 6(b) of the Notification in which it is proposed that KCOM has significant market power ("SMP conditions")

Part 1: Application, definition and interpretation of the conditions in Part 2

1. The conditions in Part 2 of this Schedule shall apply to the market identified at paragraph 6(b) of this Notification.

2. In this Schedule:

(a) "Access Charge Change Notice" has the meaning given to it in Condition FAA6.2;

(b) "Access Contract" means

(i) a contract for the provision by the Dominant Provider to another person of Network Access to the Dominant Provider's Electronic Communications Network;

(ii) a contract under which Associated Facilities in relation to the Dominant Provider's Public Electronic Communications Network are made available by the Dominant Provider to another person

(c) "**Act**" means the Communications Act 2003;

(d) "Dominant Provider" means KCOM Group plc, whose registered company number is 2150618, and any subsidiary or holding company, or any subsidiary of that holding company, all as defined by Section 1159 of the Companies Act 2006;

(e) "Hull Area" means the area defined as the Licensed Area in the licence granted on 30 November 1987 by the Secretary of State under section 7 of the Telecommunications Act 1984 to Kingston upon Hull City Council and Kingston Communications plc (now known as KCOM Group plc);

(f) "MDF Site" means the site of an operational building of the Dominant Provider that houses a main distribution frame;

(g) "Metallic Path Facilities" means a circuit comprising a pair of twisted metal wires employing electric, magnetic, electro-magnetic, electro-chemical or electro-mechanical energy to convey Signals when connected to Apparatus or an Electronic Communications Network;

(h) "**Network Component**" means, to the extent they are used in the market identified at paragraph 6(b) of this Notification, the network components specified in any direction given by Ofcom from time to time for the purpose of these Conditions;

(i) "**Ofcom**" means the Office of Communications as established pursuant to section 1(1) of the Office of Communications Act 2002;

(j) "**Reference Offer**" means the terms and conditions on which the Dominant Provider is willing to enter into an Access Contract;

(k) "Third Party" means either:
(i) a person providing a Public Electronic Communications Network; or
(ii) a person providing a Public Electronic Communications Service;

(l) "**Transfer Charge**" means the charge or price that is applied, or deemed to be applied, by the Dominant Provider to itself for the use or provision of an activity or group of activities. For the avoidance of doubt such activities or group of activities include, amongst other things, products and services provided from, to or within the market identified in paragraph 6(b) of this Notification and the use of Network Components in that market; and

(m) "**Usage Factor**" means the average usage by any Communications Provider (including the Dominant Provider itself) of each Network Component in using or providing a particular product or service or carrying out a particular activity.

3. For the purpose of interpreting the SMP conditions in Part 2:

(a) except in so far as the context otherwise requires, words or expressions shall have the meaning assigned to them in paragraph 2 of this Part above and otherwise any word or expression shall have the same meaning as it has in the Act;

(b) the Interpretation Act 1978 (c. 30) shall apply as if each of the SMP conditions in Part 2 were an Act of Parliament; and

(c) headings and titles shall be disregarded.

Part 2: The conditions

Condition FBB1 - Requirement to provide Network Access on reasonable request

FBB1.1 Where a Third Party reasonably requests in writing Network Access, the Dominant Provider shall provide that Network Access. The Dominant Provider shall also provide such Network Access as Ofcom may from time to time direct.

FBB1.2 The provision of Network Access in accordance with paragraph FBB1.1 shall occur as soon as reasonably practicable and shall be provided on fair and reasonable terms, conditions and charges and on such terms, conditions and charges as Ofcom may from time to time direct.

FBB1.3 The Dominant Provider shall comply with any direction Ofcom may make from time to time under this Condition.

Condition FBB2 – Requests for new Network Access

FBB2.1 The Dominant Provider shall, for the purposes of transparency, publish reasonable guidelines, in relation to requests for new Network Access made to it. Such guidelines shall detail:

(a) the form in which such a request should be made;

(b) the information that the Dominant Provider requires in order to consider a request for new Network Access; and

(c) the time-scales in which such requests will be handled by the Dominant Provider.

FBB2.2 These guidelines shall meet the following principles:

(a) the process should be documented end-to-end;

(b) the timescales for each stage of the process shall be reasonable;

(c) the criteria by which requests will be assessed shall be clearly identified; and

(d) any changes to the guidelines be agreed between the Dominant Provider and industry.

FBB2.3 The Dominant Provider shall, upon a reasonable request from a Third Party considering making a request for new Network Access, provide that Third Party with information so as to enable that Third Party to make a request for new Network Access. Such information shall be provided within a reasonable period.

FBB2.4 On receipt of a written request for new Network Access, the Dominant Provider shall deal with the request in accordance with the guidelines described at paragraph FBB2.1 above. A modification of a request for new Network Access which has previously been submitted to the Dominant Provider, and rejected by the Dominant Provider, shall be considered as a new request.

FBB2.5 The Dominant Provider is required to provide Ofcom with a description of the processes it has put in place to ensure compliance with this Condition FBB2. The Dominant Provider shall keep those processes under review to ensure that they remain adequate for

that purpose. Where changes to the process are agreed with industry, the Dominant should notify Ofcom of those changes.

Condition FBB3 - Requirement not to unduly discriminate

FBB3.1 The Dominant Provider shall not unduly discriminate against particular persons or against a particular description of persons, in relation to matters connected with Network Access.

FBB3.2 In this Condition, the Dominant Provider may be deemed to have shown undue discrimination if it unfairly favours to a material extent an activity carried on by it so as to place at a competitive disadvantage persons competing with the Dominant Provider.

Condition FBB4 - Basis of charges

FBB4.1 Unless Ofcom directs otherwise from time to time, the Dominant Provider shall secure, and shall be able to demonstrate to the satisfaction of Ofcom, that each and every charge offered, payable or proposed for Network Access covered by Condition FBB1 is reasonably derived from the costs of provision based on a forward looking long run incremental cost approach and allowing an appropriate mark up for the recovery of common costs including an appropriate return on capital employed.

FBB4.2 The Dominant Provider shall comply with any direction Ofcom may from time to time direct under this Condition.

Condition FBB5 - Requirement to publish a Reference Offer

FBB5.1 Except in so far as Ofcom may otherwise consent in writing, the Dominant Provider shall publish a Reference Offer and act in the manner set out below.

FBB5.2 Subject to paragraph FBB5.9 below, the Dominant Provider shall ensure that a Reference Offer in relation to the provision of Network Access includes at least the following:

(a) a description of the Network Access to be provided, including technical characteristics (which shall include information on network configuration where necessary to make effective use of Network Access);

(b) the locations of the points of Network Access;

(c) the technical standards for Network Access (including any usage restrictions and other security issues);

(d) the conditions for access to ancillary, supplementary and advanced services (including operational support systems, information systems or databases for pre-ordering, provisioning, ordering, maintenance and repair requests and billing);

(e) any ordering and provisioning procedures;

(f) relevant charges, terms of payment and billing procedures;

(g) details of interoperability tests;

(h) details of traffic and network management;

(i) details of maintenance and quality as follows;

(i) specific time scales for the acceptance or refusal of a request for supply and for completion, testing and hand-over or delivery of services and facilities, for provision of support services (such as fault handling and repair);

(ii) service level commitments, namely the quality standards that each party must meet when performing its contractual obligations;

(iii) the amount of compensation payable by one party to another for failure to perform contractual commitments;

(i) a definition and limitation of liability and indemnity; and

(ii) procedures in the event of alterations being proposed to the service offerings, for example, launch of new services, changes to existing services or change to prices;

(j) details of measures to ensure compliance with requirements for network integrity;

(k) details of any relevant intellectual property rights;

(l) a dispute resolution procedure to be used between the parties;

(m) details of duration and renegotiation of agreements;

(n) provisions regarding confidentiality of non-public parts of the agreements;

(o) rules of allocation between the parties when supply is limited (for example, for the purpose of Co-Location or location of masts);

(p) the standard terms and conditions for the provision of Network Access; and

(q) the amount applied to:

(i) each Network Component used in providing Network Access with the relevant Usage Factors;

(ii) the Transfer Charge for each Network Component or combination of Network Components described above;

reconciled in each case to the charge payable by a Communications Provider other than the Dominant Provider.

FBB5.3 To the extent that the Dominant Provider provides to itself Network Access that:

(a) is the same, similar or equivalent to that provided to any other person; or

(b) may be used for a purpose that is the same, similar or equivalent to that provided to any other person,

in a manner that differs from that detailed in a Reference Offer in relation to Network Access provided to any other person, the Dominant Provider shall ensure that it publishes a Reference Offer in relation to the Network Access that it provides to itself which includes, where relevant, at least those matters detailed in paragraphs FBB4.2(a)-(q).

FBB5.4 The Dominant Provider shall, within one month of the date that this Condition enters into force, publish a Reference Offer in relation to any Network Access that it is providing as at the date that this Condition enters into force.

FBB5.5 The Dominant Provider shall update and publish the Reference Offer in relation to any amendments or in relation to any further Network Access provided after the date that this Condition enters into force.

FBB4.6 Publication referred to above shall be effected by:

(a) placing a copy of the Reference Offer on any relevant website operated or controlled by the Dominant Provider; and

(b) sending a copy of the Reference Offer to Ofcom.

FBB4.7 The Dominant Provider shall give Ofcom at least ten days prior written notice of any amendment to the Reference Offer coming into effect.

FBB4.8 The Dominant Provider shall send a copy of the current version of the Reference Offer to any person at that person's written request (or such parts which have been requested).

FBB4.9 The Dominant Provider shall make such modifications to the Reference Offer as Ofcom may direct from time to time.

FBB4.10 The Dominant Provider shall provide Network Access at the charges, terms and conditions in the relevant Reference Offer and shall not depart therefrom either directly or indirectly.

FBB4.11 The Dominant Provider shall comply with any direction Ofcom may make from time to time under this Condition.

Condition FBB6 - Requirement to notify charges and terms and conditions

FBB6.1 Except in so far as Ofcom may otherwise consent in writing, the Dominant Provider shall publish charges, terms and conditions and act in the manner set out below.

FBB6.2 Save where otherwise provided in Condition FBB6, the Dominant Provider shall send to Ofcom and to every person with which it has entered into an Access Contract covered by Condition FBB1 a written notice of any amendment to the charges, terms and conditions on which it provides Network Access or in relation to any charges for new Network Access (an "Access Charge Change Notice") not less than 90 days before any such amendment comes into effect for Network Access being provided on the date that this Condition enters into force, or not less than 28 days before any such amendment comes into effect for new Network Access provided after the date that this Condition enters into force.

FBB6.3 The Dominant Provider shall ensure that an Access Charge Change Notice includes:

(a) a description of the Network Access in question;

(b) a reference to the location in the Dominant Provider's current Reference Offer of the terms and conditions associated with the provision of that Network Access;

(c) the date on which or the period for which any amendments to charges, terms and conditions will take effect (the "effective date");

(d) the current and proposed new charge and the relevant Usage Factors applied to each Network Component comprised in that Network Access, reconciled in each case with the current or proposed new charge; and

(e) the information specified in sub paragraph (d) above with respect to that Network Access to which that paragraph applies.

FBB6.4 The Dominant Provider shall not apply any new charge, term and condition identified in an Access Charge Change Notice before the effective date.

FBB6.5 To the extent that the Dominant Provider provides to itself Network Access that:

(a) is the same, similar or equivalent to that provided to any other person; or

(b) may be used for a purpose that is the same, similar or equivalent to that provided to any other person,

in a manner that differs from that detailed in an Access Charge Change Notice in relation to Network Access provided to any other person, the Dominant Provider shall ensure that it sends to Ofcom an Access Charge Change Notice in relation to the Network Access that it provides to itself which includes, where relevant, at least those matters detailed in paragraphs FBB6.3(a)-(e).

Condition FBB7 – Requirement to notify technical information

FBB7.1 Save where Ofcom consents otherwise, where the Dominant Provider:

(a) proposes to provide Network Access covered by Condition FBB1, the terms and conditions for which comprise new:

(i) technical characteristics (including information on network configuration where necessary to make effective use of the Network Access);
(ii) locations of the points of Network Access; or
(iii) technical standards (including any usage restrictions and other security issues), or

(b) proposes to amend an existing Access Contract covered by Condition FB1 by modifying the terms and conditions listed in paragraph FB6.1(a)(i) to (iii) on which the Network Access is provided,

the Dominant Provider shall publish a written notice (the "Notice") of the new or amended terms and conditions within a reasonable time period, but not less than 90 days before either

the Dominant Provider enters into an Access Contract to provide the new Network Access or the amended terms and conditions of the existing Access Contract come into effect.
This obligation for prior notification will also not apply in relation to new or amended technical specifications determined by the NICC Standards Limited (namely, the private limited company NICC Standards Limited, whose registered company number is 6613589).

FBB7.2 The Dominant Provider shall ensure that the Notice includes:

(a) a description of the Network Access in question;

(b) a reference to the location in the Dominant Provider's Reference Offer of the relevant terms and conditions; and

(c) the date on which or the period for which the Dominant Provider may enter into an Access Contract to provide the new Network Access or any amendments to the relevant terms and conditions will take effect (the "effective date").

FBB7.3 The Dominant Provider shall not enter into an Access Contract containing the terms and conditions identified in the Notice or apply any new relevant terms and conditions identified in the Notice before the effective date.

FBB7.4 Publication referred to in paragraph FBB7.1 shall be effected by:

(a) placing a copy of the Notice on any relevant website operated or controlled by the Dominant Provider;

(b) sending a copy of the Notice to Ofcom; and

(c) sending a copy of the Notice to any person at that person's written request, and where the Notice identifies a modification to existing relevant terms and conditions, to every person with which the Dominant Provider has entered into an Access Contract covered by Condition FBB1. The provision of such a copy of Notice may be subject to a reasonable charge.

Schedule 3

Modification to SMP Condition OA2

1. SMP Condition OA2 shall be modified by inserting the following new paragraph OA2.X at the end of Condition OA2 in Schedule 2 to the 2004 Regulatory Accounting Notification –

   OA2.X The following Directions (as modified) given under Condition FA10.2 shall continue to have force under this Condition as if they were given under Condition OA2, and shall be read accordingly:

   a) The Direction published at Schedule 2 to the 2004 Regulatory Accounting Notification, as modified by:
      i) the Direction published at Annex 1 of the statement entitled *Changes to BT's regulatory financial reporting framework, dated 31 August 2005* (the "2005 Regulatory Accounting Notification");
      ii) the Direction published at Annex 1 of the statement entitled *Changes to BT's regulatory financial reporting and audit requirements, dated 16 August 2006* (the "2006 Regulatory Accounting Notification"); and
      iii) the Direction published at Annex 3 of the statement entitled *Changes to BT's 2007/08 regulatory financial statements, dated 26 June 2008* (the "2008 Regulatory Accounting Notification"),

      which relates to BT's obligations under SMP service Condition FA10, in that it specifies the network components which apply to the wholesale cost accounting and accounting separation obligations in relation to BT's activities within the market identified in the 2004 Notification;

   b) the Direction published at Schedule 4 to the 2004 Regulatory Accounting Notification, as modified by:
      i) the Direction published at Annex 2 to the 2005 Regulatory Accounting Notification;
      ii) the Direction published at Annex 3 to the 2006 Regulatory Accounting Notification;
      iii) the Direction published at Annex 4 of the statement entitled *BT's regulatory financial reporting requirements dated 30 May 2007* (the "2007 Regulatory Accounting Notification");
      iv) at Annex 4 to the 2008 Regulatory Accounting Notification, ; and
      v) at Annex 4 of the statement entitled *Changes to BT and KCOM's regulatory financial reporting – 2008/09 update,* dated 15 June 2009 (the "2009 Regulatory Accounting Notification"),

      which relates to BT's obligations under SMP services condition FA10, in that it sets out requirements for the preparation, audit and delivery of regulatory financial statements in respect of wholesale cost accounting, accounting separation and retail cost accounting (the "FA10 Preparation, audit and delivery Direction (as amended)"); and

   c) the Direction published at Schedule 5 to the 2004 Regulatory Accounting Notification, as modified by:
      i) the Direction published at Annex 3 to the 2005 Regulatory Accounting Notification;

ii) the Direction published at Annex 4 to the 2006 Regulatory Accounting Notification;
iii) the Direction published at Annex 5 to the 2007 Regulatory Accounting Notification;
iv) the Direction published at Annex 5 to the 2008 Regulatory Accounting Notification; and
v) the Direction published at Annex 5 to the 2009 Regulatory Accounting Notification,

which relate to BT's obligations under SMP services condition FA10, in that it sets out the form and content to be applied by BT in preparing certain regulatory financial statements required by virtue of condition FA10.5 and the FA10 Preparation, audit and delivery Direction (as amended).

Annex 7

Legal Instrument: key performance indicators

NOTIFICATION UNDER SECTION 49 OF THE COMMUNICATIONS ACT 2003

Draft/Proposed Direction under section 49 of the Communications Act 2003 and Condition [FAA8.1] proposed on BT as a result of the market power determination made by Ofcom that BT has significant market power in the market for [wholesale local access services] in the UK excluding the Hull Area.

Proposal in this Notification

1. Ofcom is proposing, in accordance with section 49(4) of the Act, to give a Direction in relation to the publishing of Local Loop Unbundling Services Key Performance Indicators.

2. The proposed direction setting Local Loop Unbundling Services KPIs is set out in the Schedule to this Notification.

3. The effect of, and the reasons for giving, the proposed direction are set out in the accompanying consultation document.

Ofcom's duties

4. In making the proposal set out in this Notification, Ofcom has considered and acted in accordance with its general duties in section 3 of the Act and the six Community requirements in section 4 of the Act.

Making representations

5. Representations may be made to Ofcom about this proposal set out in this Notification and the accompanying explanatory statement by no later than 1 June 2010.

6. In accordance with section 50 of the Act, copies of this Notification have been sent to the Secretary of State, the European Commission and to the regulatory authorities of every other Member State.

Interpretation

7. Except as otherwise defined in this Notification, words or expressions used shall have the same meaning as they have been ascribed in the Act.

8. In this Notification—

a) **"Act"** means the Communications Act 2003 (c.21);

b) **"BT"** means British Telecommunications plc, whose registered company number is 1800000, and any of its subsidiaries or holding companies, or any

subsidiary of such holding companies, all as defined in section 1159 of the Companies Act 2006;

c) **"Hull Area"** means the area defined as the 'Licensed Area' in the licence granted on 30 November 1987 by the Secretary of State under section 7 of the Telecommunications Act 1984 to Kingston upon Hull City Council and Kingston Communications (Hull) plc (now known as KCOM);

d) **"KPIs"** means Key Performance Indicators;

e) **"Ofcom"** means the Office of Communications as established pursuant to section 1(1) of the Office of Communications Act 2002; and

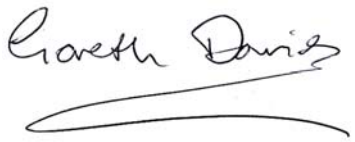
f) **"United Kingdom"** has the meaning given to it in the Interpretation Act 1978 (c.30).

9. For the purpose of interpreting this Notification—

a) headings and titles shall be disregarded; and

b) the Interpretation Act 1978 (c. 30) shall apply as if this Notification were an Act of Parliament.

10. The Schedule to this Notification shall form part of this Notification.



GARETH DAVIES
Competition Policy Director

A person duly authorised in accordance with paragraph 18 of the Schedule to the Office of Communications Act 2002

23 March 2010

Schedule

[Proposed] Direction under section 49 of the Communications Act 2003 and Condition FAA8.1 requiring the publication of KPIs for specified Local Loop Unbundling Services imposed on BT as a result of a market power determination made by Ofcom that BT has significant market power in the market for [wholesale local access services] within the United Kingdom, but not including the Hull Area

Background

1. On [date of final statement] Ofcom concluded its [*Review of the wholesale local access market]* in which it identified markets, made market power determinations and set appropriate SMP conditions as set out in the Notification at Annex [X] to the review, and with the reasons and effect explained in the accompanying explanatory statement.

2. Ofcom determined in the review referred to in paragraph 1 above, that BT, as a Dominant Provider, has significant market power in, the market for wholesale local access services within the United Kingdom, excluding the Hull Area.

SMP service condition FAA8 (Quality of service) was set in relation to the market referred to in paragraph 2 above and this Direction concerns matters to which the condition relates.

3. For the reasons set out in Sections [ ] of the explanatory statement accompanying this Direction, Ofcom is satisfied that, in accordance with section 49(2) of the Act, this Direction is:

i. objectively justifiable in relation to the networks, services, facilities, apparatus or directories to which it relates;

ii. not such as to discriminate unduly against particular persons or against a particular description of persons;

iii. proportionate to what it is intended to achieve; and

iv. in relation to what it is intended to achieve, transparent.

4. For the reasons set out in Section [ ] of the explanatory statement accompanying this Direction, Ofcom is satisfied that it has acted in accordance with the relevant duties set out in sections 3 and 4 of the Act.

7. Ofcom has considered every representation about the proposed Direction duly made to it and the Secretary of State has not notified Ofcom of any international obligation of the United Kingdom for this purpose.

Direction

8. Ofcom hereby, pursuant to section 49 of the Act and proposed Condition FAA8 in Schedule [1] to the Notification, published in this document, gives the following Direction:

9. The Dominant Provider shall publish the information specified in Annex A to this Direction in relation to the provision of Local Loop Unbundling Services.

10. The information required by paragraph 9 shall be published and provided as required by the Dominant Provider within 14 Working Days of the last Working Day of the Reporting Period in respect of that Reporting Period.

11. The reference to publishing in paragraphs 9 and 10 will be satisfied by placing a copy of the required information on any relevant website operated or controlled by the Dominant Provider.

12. The Annex to this Direction forms part of the Direction.

13. Nothing in this Direction shall require the Dominant Provider to publish confidential information relating to its business or that of a Third Party.

14. For the purpose of interpreting this Direction the following definitions shall apply:

(a) "Act" means the Communications Act 2003;

(b) "Dominant Provider" means British Telecommunications plc, whose registered company number is 1800000, and any British Telecommunications plc subsidiary or holding company, or any subsidiary of that holding company, all as defined in section 1159 of the Companies Act 2006;

(c) "Fault" means a degradation or problem or with Interconnection Circuits which is identified by the Dominant Provider or a Third Party and which is registered on the Dominant Provider's operational support system;

(d) "Hull Area" means the area defined as the 'Licensed Area' in the license granted on 30 November 1987 by the Secretary of State under section 7 of the Telecommunications Act 1984 to Kingston upon Hull City Council and Kingston Communications (Hull) plc;

(e) "Installed Base" means the average number of Local Loop Unbundling Services that are in use during the Reporting Period;

(f) "KPI" means key performance indicator;

(g) "Local Loop Unbundling Services" means each of the following provided by the Dominant Provider:

i. Shared MPF;
ii. MPF;

(h) "MPF" means a circuit comprising a pair of twisted metal wires employing electric, magnetic, electro-magnetic, electro-chemical or electro-mechanical energy to convey Signals when connected to an Electronic Communications Network;

(i) "Notification" means the Notification referred to in paragraph [ ] of this Direction above, as published on [date of Final Statement];

(j) "Order" means a request for Local Loop Unbundling Services submitted to the Dominant Provider by a Third Party;

(k) "Reporting Period" means the period of one week;

(l) "Shared MPF" means the non-voice band frequency of MPF;

(m) "Third Party" means either:
i. a person providing a Public Electronic Communications Network; or
ii. a person providing a Public Electronic Communications Service;

(n) "Working Day" means any day other than Saturdays, Sundays, public holidays or bank holidays in the United Kingdom.

17. Except insofar as the context otherwise requires, words or expressions shall have the meaning assigned to them and otherwise any word or expression shall have the same meaning as it has in the Act, or if it has no meaning there, in Part 1 of Schedule 1 to the Notification.

18. For the purpose of interpreting this Direction*:*

i. headings and titles shall be disregarded; and
ii. the Interpretation Act 1978 shall apply as if this Direction were an Act of Parliament.

19. This direction shall take effect on the day it is published.

Annex A

Local Loop Unbundling Services KPIs

1. The Dominant Provider shall publish the information required in KPIs (i) to (vii) below in relation to the provision of Local Loop Unbundling Services, in at least the detail outlined below:

(i) separate KPI results where options exist for Third Parties to purchase differing levels of service.

2. The Dominant Provider shall also publish the information in KPIs (ii) to (vii) below in relation the provision of Local Loop Unbundling Services or equivalent services to itself;

3. The Dominant Provider shall provide to Ofcom KPIs as described in paragraphs 1 and 2 above by electronic mail to the designated person.

4. The Dominant Provider shall also provide to Ofcom data relating to specific Third Parties upon request.

5. The Dominant Provider shall provide to each third party on a confidential basis via a link on any relevant website operated or controlled by the Dominant Provider, the information required in KPIs (i) to (vii) below for that Third Party.

KPIs

KPI(i) Installed Base

KPI(ii) order volumes

KPI(iii) order completion times

KPI(iv) percentage of orders provisioned right first time

KPI(v) fault volumes

KPI(vi) fault repair times

KPI (vii) percentage of faults repaired first time

Annex 8

Retail product market definition

Relationship between wholesale and retail markets

A8.1 The analysis of retail market definitions is logically prior to the definition of wholesale markets. This is because demand for WLA is derived from demand for access at the retail level, i.e., the level of demand for the upstream input depends on the demand for the retail services which it supports. The principle that market power in one market may be constrained by competition in a related market is well-established. Failure to consider retail level constraints could lead to incorrect conclusions regarding market power and inappropriate remedies at the wholesale level.

A8.2 If the upstream input accounts for a sufficiently large proportion of the downstream price, the range of available substitutes at the downstream (retail) level will inform the likely range of substitutes for the upstream (wholesale) service. This is because a rise in the price of a wholesale service which is passed through to the retail service will cause retail customers to switch retail products, so reducing demand for the wholesale input.

Relevance of existing regulation

A8.3 When defining downstream markets for the purpose of assessing SMP upstream, it is necessary to assume that upstream regulation is absent in the market under consideration as illustrated in Step 1 of Figure 3.1.

A8.4 Any finding of SMP in the WLA market may not be eliminated by regulation, but the ability to exploit an upstream-market SMP in the downstream market is controlled by it.

A8.5 We have therefore considered demand-side and supply-side substitution possibilities at the retail level only if they are economically viable in the absence of SMP regulation in the market being considered. This approach is consistent with the EM.

A8.6 Final customers' demand for various communications services drive the demand for local access connections required for the delivery of such services. Therefore local access products considered in this review are inherently wholesale-level products. The relevant downstream wholesale markets provide the link between the local access connections and the retail markets, and it is therefore appropriate to first define the retail markets that lie immediately downstream of WLA.

A8.7 As illustrated in Figure 3.5, a fixed line local access connection continues to be an integral element in the delivery of retail services such as voice telephony and data services for most users. It forms a substantial component part of any retail exchange line services product, and is the subject of this review. Therefore, the relevant retail markets to consider in this market review are:

- Fixed narrowband exchange line markets. We concluded a review of the retail markets, and most of the wholesale narrowband exchange line markets in

September 2009[119]. This review will not revisit the analyses undertaken but will draw on the conclusions to inform the analysis of WLA product markets;

- Asymmetric broadband access markets. We concluded the previous WBA market review in 2008[120], and will revisit the conclusions reached for the purposes of this market review. A fuller analysis is carried out within the WBA consultation document, published today[121]; and

- Retail leased lines markets. We concluded our business connectivity market review (BCMR) in December 2008[122]. Again, this review will draw on the conclusions to inform the analysis of WLA product markets.

A8.8 In general, it is not given that suppliers of local loop connections, or potential substitutes, would make local access products available at the wholesale level in absence of regulation. BT provides a WLA product to other operators due to requirements of existing regulation. Virgin Media, for example, do not provide such services on a stand-alone basis, choosing instead to offer a vertically integrated product only.

Fixed narrowband exchange lines

A8.9 As illustrated in Figure 3.5, a relevant exchange line product comprises:

- The local loop or analogous local access connection;

- The equipment connected to either end of the local loop (such as NTE, remote concentrator and line cards); and

- Range of supplementary services associated with that loop (such as call waiting and '1471' service).

A8.10 The main providers of exchange lines on the fixed network in the UK are BT, KCOM, Virgin Media, TalkTalk and Sky. There are other providers who are focused on supply business customers that also provide exchange lines via self-supply. OCPs buy BT's wholesale products to offer services to retail customers, both business and residential.

A8.11 Our Consumer Experience[123] report shows that whilst take-up of fixed line phones have reduced over the last decade, it has stabilised over the last two years at 87 per cent, with around 13 per cent of homes relying solely on their mobile phones for their telecoms needs. Take-up of internet access continues to grow, with 18 million UK residential and small and medium enterprises ("SME") broadband connections

[119] Some specific outstanding elements of the wholesale narrowband exchange line market review (wholesale transit services and call termination) were finalised in February 2010, see http://www.ofcom.org.uk/consult/condocs/wnmr_statement_consultation/statement/statement.pdf
[120] *Ofcom, Review of the wholesale broadband access markets, May 2008*. http://www.ofcom.org.uk/consult/condocs/wbamr07/statement/
[121] Ofcom, Review of the wholesale broadband access markets, March 2010, see http://www.ofcom.org.uk/consult/wba/
[122] Ofcom, Business connectivity market review, December 2008. http://www.ofcom.org.uk/consult/condocs/bcmr08/
[123] *Ofcom, The Consumer Experience 2009 Research Report*, 9 December 2009. http://www.ofcom.org.uk/research/tce/ce09/

at the end of June 2009, 1.1 million more than a year previously.[124] The report also shows that broadband internet access connections contribute to 96 per cent of all internet access connections.

A8.12 As illustrated in Figure 3.1, product markets definition at the retail level is carried out in the absence of wholesale regulation. Under these circumstances it is questionable as to whether a hypothetical monopolist would make wholesale products available since it allows other retailers to effectively compete with its own retail operations. Therefore, in considering retail narrowband exchange line markets, no assumption is made as to whether WLR or LLU are provided.

A8.13 Drawing on our 2009 market review of fixed wholesale narrowband markets[125], and abstracting from the wholesale remedies in place for the purposes of assessing the WLA market, we propose that at the wholesale level:

- There is a separate market for fixed access and calls;
- Mobile access is in a separate market to fixed access;
- There is a single market for business and residential customers; and
- Analogue, ISDN2 and ISDN30[126] exchange lines are all in separate markets.

A8.14 Each of these aspects of the wholesale narrowband market is explored in detail below.

Access versus calls

A8.15 The relevant wholesale remedies upstream of the retail narrowband market are WLR and LLU. Assuming that these products are not made available in the absence of regulation, it would reduce the number of providers in the market since CPs would have to build their own network of exchange lines in order to serve the market. That is, the two relevant operators would be BT and Virgin Media, i.e., vertically integrated operators with their own networks.

A8.16 For a customer to make a call, an active access connection is required, so it is unlikely that access and call products will be viewed as substitutes. This is consistent with the EM which identified separate markets for access and calls.

A8.17 In addition, evidence from our survey carried out for the 2009 narrowband market review also suggested that at the retail level access and calls are not in the same cluster market, i.e., they are typically bought and sold separately. Both residential and business customers viewed the two as separate purchasing decisions and were prepared to switch either one in response to changes in relative prices between them.

A8.18 Wholesale level exchange line services allow a CP to provide of both access and calls to a retail customer and therefore is independent of the definition in the retail market.

---

[124] *Ofcom, Telecommunications Market Data Update Q2 2009,* December 2009. http://www.ofcom.org.uk/research/cm/tables/q2_2009/

[125] Ofcom*, Review of the fixed narrowband services wholesale markets*. September 2009 http://www.ofcom.org.uk/consult/condocs/wnmr_statement_consultation/

[126] Ofcom is conducting a further review of the retail and wholesale ISDN30 markets.

Mobile versus fixed access

A8.19 In the retail market, our research for the wholesale narrowband review showed that residential consumers overwhelmingly demand both mobile and fixed line access services. In addition, survey evidence suggested that there has been little substitution away from fixed lines over the last five years despite absolute and relative price reductions for mobile services. This may be partly due to consumers' demand for fixed lines being driven by non-price factors such as a feeling of security with having a fixed line, disruption involved discontinuing with a fixed line, and reliability compared to mobile lines. We recognised that there is an important minority who did view mobile and fixed access as substitutes. However, the predominant view by residential customers suggested that mobile and fixed access were more appropriately considered to be in separate markets.

A8.20 The research also indicated that businesses attach a similar or greater importance to retaining a landline than residential customers. They also regard landline services as being essential for their needs and would not consider giving it up. Therefore, it is unlikely that a small increase in the price of fixed access would induce businesses to switch away to mobile access, and suggest that the two should be considered as separate markets.

A8.21 These results showed that the proportion of mobile-only customers is small, and has been growing at a slow rate over the last few years. Applying a SSNIP test to the price of fixed access is unlikely to generate a sufficient number of customers to switch to mobile access. This is due to the non-price reasons for keeping a landline, and so the evidence is unlikely to support a single fixed and mobile access market.

A8.22 Additionally, on the supply side there is limited substitution from mobile as it does not support the features consumers value in fixed access. Retail providers of fixed access are therefore not able to replace provision of fixed access services with a mobile access network.

Residential and business markets

A8.23 As stated earlier, in the absence of wholesale market regulation BT and Virgin Media are likely to be the only providers of retail products in the market. Given the differences in business and residential requirements form exchange lines, it is likely that they would structure retail tariffs to reflect such differences. For example, retail tariffs structured such that businesses are likely to remain better off with lower or capped call charges during peak hours to reflect their call volumes and profiles.

A8.24 On demand-side substitution, it is unlikely that a sufficient number of businesses would consider switching to a residential tariff in response to a SSNIP in all business packages. In addition, service benefits such as premium support, free entry in the Business A-Z section of The Phone Book and range of inclusive calling features mean that switching to a residential package is made less likely.

A8.25 Since this analysis abstracts from wholesale market regulation, it is unlikely that there would be any supply-side substitution from alternative providers in response to a SSNIP. They would either build their own network or require access to a wholesale product.

A8.26 In response to a SSNIP alternative providers could build their own network to reach either the business or the residential markets. However, but the large investment costs associated with network rollout are unlikely to be justified by the proportion of

customers willing to switch and the initial SSNIP. In addition, such investment are likely to take longer than the 12 months time frame under consideration.

A8.27 On the other hand, wholesale products are not likely to be made available on a voluntary basis in this scenario. If this is the case only those with an exchange line network would have the ability to offer retail services, and the same network would be used to deploy services to both residential and business customers.

A8.28 The common pricing constraint argument can also be applied in this case. The level of differentiation between wholesale business and residential products are unlikely to be significant since the underlying function of access and calls are the same regardless of end user type. The additional retail benefits provided to business customers are largely independent from the product characteristics of a wholesale exchange line. As a result, the pricing of these two services would have to be similar to avoid CPs exploiting any arbitrage opportunities.

A8.29 Looking at current wholesale products available, residential and business analogue wholesale lines have become less differentiated since the previous wholesale narrowband market review in 2003, with service levels now being the key difference between business and residential customers. Openreach currently offer a “Basic” wholesale line rental product priced at £100.68 per annum excluding VAT and a “Premium” one at £110.38. Given this price differential, it is be likely that a five to ten per cent increase in the price of the “Basic” product would encourage sufficient substitution to the “Premium” line so as to make the SSNIP unprofitable.

A8.30 Similarly if LLU was offered voluntarily, it would allow CPs to expand their footprint at lower cost[127] and compete directly with the network operator in the downstream market. Once an LLU operator has a network in place, it is able to supply exchange lines to both residential as well as business users. As a result, a SSNIP applied to a residential wholesale product is likely to induce supply-side substitution at the wholesale level.

A8.31 To inform our WLA product market definition we propose that at the wholesale level, business and residential exchange line services belong to the same product market based on the reasons above.

Asymmetric broadband internet access

A8.32 In the 2008 WBA market review we defined WBA products as asymmetric broadband access and any backhaul as necessary to allow interconnection with OCPs. Backhaul is always required in order to carry the traffic generated by the CPs’ customers. Also, there will be migration of WBA products to next generation infrastructure within the timeframe of this market review, and inherent unpredictability during this time concerning the precise method in which these services will be delivered. As such, we consider it appropriate to retain this definition for the 2010 WBA market review.

A8.33 As illustrated in Figure 3.5, the provision of asymmetric broadband internet access requires a local access connection to the end user’s premises. In almost all cases, that local access connection is made using a local loop, supporting DSL broadband technology, or a cable connection. In most cases, the connection itself will be provided already as part of an exchange line service. Investments by BT to upgrade the loop-based local access connections to enable broadband have meant that

[127] Although the costs of deploying LLU for the support of narrowband services are still substantial.

almost 100 per cent of UK households are now connected to a DSL-enabled exchange.[128]

A8.34 The retail asymmetric broadband internet access market is being considered as part of the 2010 WBA market review. Our proposals for the WBA product market definition are as follows:

- Loop-, cable- and fibre-based asymmetric broadband access are considered to be in the same product market;
- No speed boundary within the asymmetric broadband access market;
- Narrowband internet access is in a separate market to broadband access;
- Symmetric broadband internet access is in a separate market to asymmetric broadband access;
- Mobile-, fixed wireless- and satellite-based access are in separate markets; and
- Residential and business services are in the same market.

A8.35 In relation to the bundling of communications services, we also propose that:

- The asymmetric broadband access product definition does not include all other services in the bundle; and
- Broadband access services included in a bundle are in the same market as broadband access services that are provided as a stand-alone service.

Narrowband internet access

A8.36 Developments in the internet access market over the last few years have meant that narrowband internet access now only account for 4 per cent of total internet access connections amongst UK households, and has continued to decline even though it is still available as a backup solution. It is likely that narrowband internet access will continue to decline in importance in the internet access market over the period covered by this review.

A8.37 The technical specifications of a dial up service remains unchanged (i.e., maximum speed of 56 kbit/s with high latency), whereas the connectivity requirements to access current online content have increased (e.g., higher bandwidth and data downloads). In light of this growing divergence, coupled with the inability for dial up internet access to mimic the three characteristics of broadband services, it is unlikely that customers would substitute to dial up when faced with a 10 per cent increase in price of broadband.

A8.38 As in the 2008 WBA market review, we propose that narrowband and broadband services are in separate economic product markets. This is the same regardless of whether or not LLU is provided in the absence of wholesale regulation.

[128] About 5000 premises are not connected to an ADSL-enabled exchange (27 exchanges in total, mainly in the Scottish Islands). Note that being connected to an ADSL-enabled exchange does not necessarily imply ADSL service availability, as a connected household may be unable to receive an ADSL-based service due to technical limitations such as line length.

Symmetric broadband access

A8.39 SDSL broadband services run over one pair of copper wires, typically with a maximum range of about 3 kilometres. The main difference between ADSL and SDSL is that ADSL has been designed to co-exist with narrowband voice on the same line whilst SDSL has been designed to use the available bandwidth exclusively. SDSL has the same upstream data rate as downstream (symmetrical), whereas ADSL always has smaller upstream bandwidth (asymmetrical). In addition, SDSL services are generally available at speeds up to 2 Mbit/s each way, with contention ratios mostly marketed at 10:1, although services are available from 1:1 (i.e., uncontended) to 20:1 (higher contention ratios are technically possible).

A8.40 The BCMR in 2008 concluded that the retail market for leased lines includes SDSL but not ADSL services. The survey carried out for the BCMR concluded that businesses who opt for SDSL place significant value on the symmetric part of their service. As such, it was unlikely that they viewed ADSL services as potential demand-side substitutes for their SDSL services.

A8.41 Our consumer research for this market review indicates that the extent to which local access is currently used to provide symmetric broadband internet access via SDSL technology is currently around 4 per cent for business customers and zero for residential customers. The majority of businesses who are currently on ADSL showed no interest in pay extra for either SDSL (53 per cent) or leased lines (69 per cent). In addition, SDSL services prices are higher than ADSL- or cable-based broadband access, both in terms of the set up costs (more expensive modems and need an additional telephone line) and monthly charges (e.g., reflecting lower contention ratios). Therefore a 10 per cent SSNIP in the price of ADSL- or cable-based broadband services is unlikely to drive a sufficient proportion of customers to switch to SDSL services and make the original price increase unprofitable.

A8.42 It could be expected that end users, including residential customers, increasingly value lower contention ratios and higher upload speeds in the future. Current developments, particularly around NGA, have meant that higher download and upload speeds are being achieved. For example, Virgin Media is currently testing 10 Mbit/s upload speeds, which is sufficient to satisfy a 2 Mbit/s SDSL service. This may undermine the need for some low bandwidth symmetric services. This is supported by the fact that BT is not proposing to offer SDSL on its NGA network.

A8.43 On the supply-side, suppliers of SDSL and leased lines services could move into the ADSL market in response to a SSNIP by a hypothetical monopolist. However, they would be using their capacity inefficiently and exacerbate the cost disadvantage compared to ADSL providers, which would translate into retail prices. Such supply is therefore unlikely to be profitable.

A8.44 We propose that symmetric broadband services are more appropriately considered to be in a separate product market from asymmetric broadband services based on our assessment of demand- and supply-side substitution possibilities. We note that this is independent of whether LLU is provided or not because the underlying characteristics of symmetric and asymmetric broadband access remain the same.

Cable

A8.45 Without upstream regulation, it is likely that ADSL-based broadband would only be provided by BT, and the ISPs would not be able to enter the market in a way the

market has seen, either by buying a WLA product such as LLU or a WBA product such as IPStream.

A8.46 In this scenario, Virgin Media and BT would compete directly at the retail level. In our 2008 WBA market review[129] we carried out consumer research on the switching behaviour between cable and ADSL broadband technologies.

A8.47 ADSL- and cable-based broadband internet access services continue to have the same intended use, have similar characteristics, and continue to be priced at similar levels for a comparable speed. Since our broadband speed report[130] individual ISPs may have started to differentiate between cable and ADSL services by referring to actual speeds that could be achieved by consumers. However, our consumer survey evidence did not find sufficient evidence to support separate markets for high speed and low speed broadband services. ISPs providing ADSL-based broadband services and Virgin Media still market their products against one another. Additional advice and information available to consumers, such as price comparison websites do not draw distinctions between cable-based and ADSL-based broadband insofar as the underlying service is concerned.

A8.48 Given the above, it is likely that consumers will continue to view the two as very close demand-side substitutes. As such, we have not sought to repeat the consumer research on switching behaviour between cable- and ADSL-based broadband services and propose that we retain the product market definition that includes cable at the retail level.

A8.49 On the other hand, in absence of regulation, or the threat of regulation, it is possible that BT would make wholesale products available.[131] At the retail level, there would be more competition amongst ADSL-based products, but also between ADSL- and cable-based products. Again, given the similarity of the retail products and customers' attitudes towards them, we consider it appropriate to treat cable-based and ADSL-based services as substitutes[132], and therefore as part of the same relevant market.

A8.50 At the wholesale level, demand would be derived indirectly from the retail demand since without wholesale cable and ADSL products there would clearly be no direct competition between the two. With no WLA remedies, Virgin Media would provide services on its cable network and BT on its copper network. In this scenario, the wholesale price is essentially an internal transfer within the business. The retail prices, however, would act as an indirect constraint on the wholesale pricing via demand-side substitution by retail customers.

A8.51 It may also be the case that without regulation, Virgin Media would have extend its coverage further[133], or for other operators (cable or otherwise) to develop their own

[129] *Ofcom, Review of the wholesale broadband access market*, 21 May 2008. http://www.ofcom.org.uk/consult/condocs/wbamr07/statement/
[130] Ofcom, *UK broadband speeds 2009,* 28 July 2009. http://www.ofcom.org.uk/media/features/broadbandspeedsjy
[131] For example, BT has continued to offer a wholesale broadband access product in Market 3 on a voluntary basis, even after 2008 when Ofcom found no operator with significant market power on a forward-looking basis and therefore removed the SMP regulation associated with it.
[132] According to Ofcom's Communications Market Report 2009, 99.98% of UK households are connected to DSL-enabled exchanges and 49% are passed by Virgin Media broadband. http://www.ofcom.org.uk/research/cm/cmrnr09/charts/
[133] However, there was little evidence of this in the early days of broadband prior to the introduction of LLU.

network. The level of competition may be higher in this scenario, leading to lower prices for the end user. However, given the similarities in the final retail product, the wholesale prices are likely to be constrained by the retail prices and therefore suggesting that a wholesale product market definition that included cable and ADSL is more appropriate.

Fibre and speed

A8.52 In 2008 we concluded that the WBA definition did not have an upper speed limit, i.e., there is a 'chain of substitution' through the available broadband internet access speeds. This means that, for an asymmetric broadband internet access product of any given speed, there are lower or higher speed products (the next links in the chain) which are sufficiently close substitutes for products of all speeds to be subject to a common pricing constraint.

A8.53 In the absence of regulation in the WLA market, BT and Virgin Media would be the only retail providers in the market. To meet the different demand characteristics of end users, it is likely that both providers would offer different speed/price options particularly if the same inputs are used.

A8.54 Looking at the evidence from our consumer survey, when respondents are faced with a 10 per cent increase in the price of their existing broadband package:

- 14 per cent of residential customers and 22 per cent of business customers would be willing to switch to a different speed package. Relative to the critical loss factor[134], this is likely to be sufficient to make the original price increase unprofitable; and

- Customers are almost as likely to switch up to a higher quality service as they would switch down to a lower quality service. That is, they see broadband packages on either side of the one they are currently on as potential substitutes should the price of their package increases. Therefore there is unlikely to be an identifiable break across the range of speeds available to warrant separate markets for low and high speed services within the current generation broadband access services available in the market.

A8.55 If wholesale products were provided voluntarily, an ISP would be able to use these inputs to meet retail demand and compete with BT and Virgin Media. However, if the wholesale products are differentiated by speed they would be subject to a direct common pricing constraint as well as an indirect demand-side substitution constraint from the retail level:

- An increase in the price of the 'lower speed' wholesale product by 10 per cent is likely to see ISPs purchasing the 'higher speed' wholesale product and configuring it to offer both 'high speed' and 'low speed' retail services. The original price increase would therefore be unprofitable; and

- Service providers may also pass on the wholesale price increase to its retail customers. We estimate a 10 per cent increase at the wholesale level would be translated into a 6.5 to 7.5 per cent increase in the retail price. Given the chain of substitution argument discussed earlier, the reduced price differential between low and high speed services may encourage end users to switch to a higher

[134] See the WBA consultation document for further details of the consumer research and critical loss calculations

speed service. This in turn would reduce the ISP's demand for the wholesale 'low speed' product. As a result, the original wholesale price increase is unlikely to be profitable.

A8.56 Fibre deployment increases the speeds that end users can expect to achieve. Where fibre-based broadband services become available, providers are likely to continue to offer a range of speed/price options. For example BT and Virgin Media both offer their high speed fibre (to the cabinet) products. Lower speed packages continue to be available for purchase in areas where these higher speed services are available.

A8.57 From an end user perspective, whether current generation services are provided over fibre or copper is likely to be an immaterial factor in their decision-making process. Looking at evidence available on the differentiation between ADSL and ADSL2+ packages our broadband speeds report found that it was not straightforward to attribute respondents to a specific broadband technology based on information on broadband providers. There is also little consumer information on underlying technologies and any differentiation in technology is translated as a differentiation in the highest speed package provided. So a SSNIP on price of ADSL1-based broadband service, it is very likely that consumers would respond by migrating to the ADSL2+-based service that gives the same speed service. This would result in the original SSNIP being unprofitable, and suggest that the market should be expanded to include ADSL2+-based services.

A8.58 As with the ADSL2+ case, one can expect that once as these networks are rolled out the same technology would also be used to deliver the lower speed services. Similar arguments can be made such that, for a given speed, end users are likely to view the copper and fibre as substitutes and that the market definition should include both technologies.

A8.59 Current service price differences between Virgin Media's super-fast fibre-based broadband access and the 'next best' is in the region of £8 a month, with higher upload and download speeds and unlimited download limit. BT's unlimited download Infinity service is priced at the same level as the Unlimited Option 3 service at £24.99 a month[135]. It is therefore likely that a SSNIP would encourage a sufficient proportion of consumers to switch to the higher speed service where they are available to make the SSNIP unprofitable.

A8.60 On a forward looking basis, it is likely that there would be an increasing demand for bandwidth over the next few years, as discussed in paragraphs 3.37 to 3.38. Such developments are likely to increase demand for higher speed services, perhaps to the point where they become a separate market, but it is too soon to say with any certainty if, or when, this might happen.

A8.61 On the supply-side, substitution from new entrants is unlikely due to the scale of investment required. An ISP would require a WBA product in order to enter the market in response to a SSNIP. Without this, the alternative is to build its own fixed networks, which would be prohibitively expensive and not possible in the short 12 month timeframe considered.

A8.62 Without regulation, BT and Virgin Media may not offer a wholesale fibre-based broadband access product to third parties, and such products would only be used

[135] See the WBA consultation document for further details of retail broadband pricing information

for self-supply for their own retail operations.[136] An increase in the notional 'wholesale' current generation product would be passed through its retail prices. As seen above, demand-side substitution possibilities would result in prices for fibre-based products that are constrained by current generation broadband products through a chain of substitution. Supply-side substitution would be limited unless ISPs deployed their own fibre networks. Given the scale and timing involved this is unlikely purely as a response to a 10 per cent SSNIP at the wholesale level. If a wholesale fibre-based product is indeed provided on a voluntary basis, there would also be an additional direct constraint from the wholesale current generation products as well as the indirect constraint from the retail market. That is, an increase in the current generation wholesale product would encourage ISPs to use the fibre-based products to provide current and next generation services. This would reduce the demand for the wholesale current generation product, and in turn reduce the profitability of the original price increase.

A8.63 Based on the analysis above, we propose that in the WBA market:

- Fibre-based broadband access is included in the product market definition; and
- There is no upper speed boundary.

Mobile

A8.64 Mobile network operators now offer a wide range of mobile broadband packages with pre/post pay options, bundled/stand-alone tariffs, up to 15GB per month download limit and up to 7.2 Mbit/s speed although actual speeds achieved by customers have been reported to be below 1 Mbit/s.[137].

A8.65 According to our research[138], by the end of Q1 2009 around 3 million households had a mobile broadband connection (approximately 12 per cent of all households). Of those with a mobile connection 75 per cent continue to have a fixed-line connection. There was also evidence of some mobile broadband substitution amongst some groups of consumers, such as single person households, transient groups (e.g., students) and lower income households where they have opted for a full substitution of mobile voice access and calls as well as for internet access. Compared to the rest of Europe, at the end of 2008 the UK had one of the lowest proportions of mobile-only households at around 13 per cent, compared to Austria with around 36 per cent.[139]

A8.66 Based on consumer usage patterns, a 10 per cent increase in the price of fixed broadband access, it is unlikely that end users would switch to mobile broadband. This is likely to be a result of constraints associated with the speed and capacity of mobile broadband, making it less feasible for in-home use where users may be more inclined to use data-hungry services such as the BBC's iPlayer.

[136] Eclipse Internet's 40 Mbit/s offering is based on BT's wholesale FTTC product. Virgin Media uses its own hybrid fibre-coaxial (HFC) for its 50 Mbit/s services.
[137] http://mobile.broadbandgenie.co.uk/broadband-news/mobile-broadband-still-crawling-at-below-1mb-despite-up-to-7mb-claims
[138] Ofcom, *Communications Market Report,* August 2009. http://www.ofcom.org.uk/research/cm/cmr09/.
[139] *Analysys Mason, Mobile broadband for fixed players*, 29 October 2009. http://www.andicom.org.co/memorias2009/jueves/2_00_Pierre_Fortier_cual%20es%20el%20futuro_de_la_banda_ancha_fija_movil.pdf

A8.67 On the supply-side in the short term, there are questions as to whether capacity of existing mobile networks would be able to support larger take up of mobile broadband switched over from existing fixed broadband demand. For example, a YouGov survey of mobile broadband customers[140] reported a considerable decline in customers' ratings for quality, value for money and satisfaction. As a result, renewal rates for such services suffered, with the key reasons for cancelling being reliability and connectivity. Such capacity limitations could be addressed by, future technological developments. This could mean that mobile broadband plays an increasingly prominent role in the household for voice and data access if more people substitute their fixed telecommunications for mobile.

A8.68 At the wholesale level, if both the mobile operators and the fixed network operators offered wholesale products in the absence of regulation, the question is whether an ISP would be able to substitute one for the other. Given the significant differences in the service characteristics between fixed and mobile broadband and consumer preferences towards the two at the retail level, it is unlikely that sufficient numbers of fixed broadband customers would switch to mobile broadband.

A8.69 Within the timescale of the current review, mobile broadband access is unlikely to be able to act as a sufficient constraint on fixed broadband pricing at the retail level. We therefore considered mobile broadband to be in a separate product market from fixed broadband products at both the retail and the wholesale level.

Fixed wireless access

A8.70 Fixed wireless access is the use of wireless technology enabling the delivery of last mile wireless access to connect subscribers to the telephone network, typically using the WiMAX standard. It can provide up to 10 Mbit/s broadband speed without the need for cables and therefore can be considered as an alternative to cable and DSL. This technology has been available for several years, and has been more generally considered to be an 'in-fill' technology that could be used to provide service to areas where cable and xDSL technologies cannot address due to technical and/or economic reasons, or as an alternative to SDSL aimed at businesses.

A8.71 For example in February 2010 VFast[141] rolled out its WiMax-based fixed wireless solution to serve a small village in Kent with the help of public funds. Other commercial propositions are primarily located in urban areas and aimed at businesses, e.g., Freedom4[142] in Manchester, Warwick and Milton Keynes, Urban WiMax[143] in London and Metranet[144] in Brighton & Hove.

A8.72 The services available in urban areas are currently priced and positioned as a cheaper alternative to SDSL and therefore targeted primarily at SMEs. For example SDSL services offered by BT are on an exchange-by-exchange basis and at 10:1 contention ratios. BT's 2 Mbit/s service is £345 per month whereas Metranet's 2 Mbit/s service is £275 a month. In comparison, Business ADSL packages typically range from £10 to £80 depending on whether features such as installation, data back-up and domain names are included or not.

[140] http://www.yougov.c o.uk/services/services-synd-DongleTrack.asp?submenuheader=4
[141] http://www.vfast.co.uk/barham/.
[142] http://www.freedom4.com/pg.asp?p=coverage
[143] http://www.urbanwimax.co.uk/wireless_technology_explained
[144] http://www.metranet.co.uk/

A8.73 The demand characteristics for symmetric and asymmetric services are such that one is unlikely to be a substitute for the other. Additionally, given the current pricing structure and marketing information, it is unlikely that fixed wireless broadband access is a demand-side substitute for asymmetric broadband services.

A8.74 On the basis of this evidence, it does not appear to us that fixed wireless can currently be regarded as effective demand-side substitutes for asymmetric broadband access by residential customers or even SMEs. Our preliminary conclusion is therefore that broadband using fixed wireless access is not part of the relevant market under consideration in this review.[145]

A8.75 On a forward-looking basis, the costs of providing fixed wireless technology are expected to continue to fall with knock-on implications on service pricing. However, we do not consider that such developments will materialise on a sufficient scale and with sufficient rapidity to affect retail market definition for the purposes of the current review. Nevertheless, over the longer term, fixed wireless may develop into a credible and effective alternative to asymmetric broadband internet access, and we will continue to monitor such developments.

Broadband access using satellite

A8.76 Satellite broadband is typically marketed as a solution where there is no ADSL or cable broadband service available. Typical satellite broadband access is available at up to 3.6 Mbit/s download and 384 kbit/s upload speeds, with prices varying depending on data usage. It is now possible to get small business systems that closely emulate ADSL, along with more dynamic low latency systems that support advanced broadband applications like VPN, VoIP and video conferencing.

A8.77 Given the type of niche service this offer, the monthly prices are higher than the ADSL or cable equivalents. For example, Broadband Wherever[146] offers a £30 a month package for residential customers with 2.4GB a month data usage compared to BT's package of £15.99 a month providing up to 20 Mbit/s download speed and a 10GB monthly usage cap. Additionally, installation costs associated with a satellite dish is also higher. For example, cable and ADSL operators tend to provide users with free wireless routers, whereas Broadband Wherever charges £599 for installation a residential system and £999 for businesses.

A8.78 Since the service characteristics between fixed and satellite broadband services are similar, the existing price differentials for residential packages mean that it is unlikely that a 10 per cent increase in the price of fixed broadband would result in sufficient customers switching to satellite broadband, particularly where ADSL and/or cable broadband is available.

A8.79 For businesses, some may find that the quality of the two-way satellite service and robustness of the hardware make them a realistic option. It may also be used as a temporary solution, for example in building sites, construction sites, ad-hoc events, temporary hire, disaster recovery and facilities for data transmission such as (Chip and PIN, or data feedback for unmanned sites), However, as in the residential case, it is unlikely that a 10 per cent SSNIP is likely to induce sufficient substitution by businesses.

[145] Alternatively, if fixed wireless broadband access were to be included in the product market definition, it is unlikely to make any material difference to the SMP findings given the current size of the market.
[146] http://www.broadbandwherever.net/products.htm

A8.80 On the supply-side it is possible that with greater take up numbers the costs of satellite broadband installation and hardware could decrease to some extent. However, within the time frame of this review, we consider that the market definition does not include satellite broadband. We will continue to monitor the situation for future reviews.

Business versus residential

A8.81 One possible scenario in the case of no wholesale regulation is that only BT and Virgin Media are in the market. Given the distinct customer profiles, BT and Virgin Media are both likely to serve both markets with differentiated products covering a range of price/quality options. Compared to residential broadband offerings, businesses typically require lower tolerance of delays compared to residential customers, lower contention ratios, higher download limits, greater upstream capacity, tailored business support helpdesk and SLGs, web hosting, more email accounts, PC security, and static IP addresses[147]. The elements included in business products will vary depending on the provider and the 'level' or 'quality' of the service.

A8.82 An increase in the price of all residential packages decreases the price differential between the most expensive residential service and the lowest priced business service. Smaller businesses who previously chose a residential package may find it worthwhile to opt for the business packages, with its additional services. This would then be included in the product market definition. In turn, when we consider the effects of a SSNIP on the wider product market, some business customers may then switch to the next business broadband package up. Such a 'chain of substitution' (similar to that described earlier when considering broadband speeds) would mean that all packages were subject to a common pricing constraint.

A8.83 At the wholesale level both BT and Virgin Media would be using the same inputs to support their retail markets. As a result, the distinction between a 'business' and 'residential' wholesale asymmetric broadband product is less clear cut, if there is one at all. This is consistent with approaches adopted in other markets as well as with the Recommendation on Markets.

A8.84 In an alternative scenario BT offers wholesale products on a voluntary basis and allows ISPs to configure the inputs as they see fit to meet the retail demand. At the retail level, this means that there would be more competition and prices may be lower. However, there would still be packages aimed specifically at businesses and residential customers with a blurred boundary between the high end residential and low end business packages. By definition, the same wholesale product could be used for supply both business and residential asymmetric broadband internet access, and ISPs would be able to substitute to the wholesale residential product in response to a SSNIP in the wholesale business product and vice versa.

A8.85 We also consider whether there is particular quality level of business broadband products for which demand-side substitution does not take place, that is, whether there is a separate market for higher quality business services. We first consider what aspects of a broadband service would constitute as a 'high quality' business

[147] Home broadband users typically have dynamic IP addresses, where a new set of numbers are assigned to the user's computer at regular intervals to identify the user's computer. Businesses may find a fixed IP address beneficial in order to allow its employees to use remote access or allow the business to run their own website.

package, and whether there are demand- and supply-side substitution possibilities that put 'high' and 'low' quality business products in the same economic market.

A8.86 In terms of service features, potential characteristics that could be considered as critical to high-end business customers such as lower contention ratios, service supplied to multiple sites, minimum throughput, SLGs, dedicated customer services etc.

A8.87 Suppose a 'high' quality broadband access product requires a contention ratio of 5:1 or less (compared with typical ratios of 50:1 for residential services and 20:1 for business products), and that this is a separate market from 'standard' business broadband products. If a hypothetical monopolist increases 'high' quality broadband services by 10 per cent:

- On the demand-side, business may consider switching to a product with a slightly higher contention ratio (e.g., 6:1) to avoid the SSNIP. In this case, services with contention ratios of 6:1 should be included in the 'high' quality business broadband market. This argument can then be extended to include 20:1 contention ratios (i.e., that of a standard business service); and

- On the supply-side, the only two operators in the market would be BT and Virgin Media in the absence of wholesale regulation. Even with voluntary wholesale products, suppliers of low contention ratio products would be able to configure their service to offer a higher contention ratio product simply by configuring the inputs to specify the number of end users that share a certain bandwidth.

A8.88 Previous Ofcom business surveys suggested that large multi-site business users required broadband access services with a range of contention ratios depending on its requirements at each site. They also suggest that business users were prepared to compromise on contention ratios to some extent in response to a SSNIP. As such, it appears unlikely that a hypothetical monopolist offering a pre-specified service level would be able to impose and sustain a profitable SSNIP. Therefore it is unlikely to find a specific value of contention ratio between 1:1 and 20:1 for which there is a break in the demand-side substitutability.

A8.89 Other service characteristics associated with business broadband products include minimum throughput and service care levels. Again, exact specifications required by businesses will vary and depend on individual circumstances. Further, publicly available marketing information targeted at large business users do not tend to suggest a particular level of contention ratio, minimum throughput or any other characteristics.

A8.90 We note that regardless of the retail definition the focus of this market review is at the wholesale level where there is less differentiation between services targeted at business and residential customers. Accordingly, we consider that there is a single market including all grades of residential and broadband services.

A8.91 Given the discussions above, we propose that:

- 'standard' and 'high quality' business broadband services are considered to be in the same retail market; and

- there is a single business and residential market at the retail and wholesale level.

A8.92 This is consistent with approaches adopted in other markets, as well as with the Recommendation on Markets.

Self-supply

A8.93 We consider that in the absence of a regulatory requirement to provide a wholesale service, such as LLU or WBA product, they would not necessarily be offered. As a result, the only such products would be those that are self-supplied. Other network operators (such as Virgin Media) self-supply a notional WBA for its retail cable broadband products. These provide an indirect constraint on the pricing of the copper-based broadband products. Therefore it is appropriate to include in the market definition the notional supply of wholesale products by other operators which self provide these elements in order to be able to offer a retail broadband service.

A8.94 In the case where a wholesale service is provided, the key difference is that ISPs would be able to enter the market and compete directly at the retail level. Since the wholesale demand is derived from the retail market and the whole retail market would be considered to be in the same product market, it follows that the network operators' own use of wholesale products should also be taken into account.

Bundled services

A8.95 The current telecommunications and media markets are characterised by triple- and quadruple-play suppliers. That is, broadband access can be found bundled with different combinations of fixed telephone, mobile phone contract and pay TV services. We note that this has come about as a result of wholesale regulation and the availability of wholesale products.

A8.96 There are in principle two questions related to bundling:

- Should all services in a bundle be treated as a single market? This would be the case if all consumers always bought the (same) services as a bundle from a single supplier; and

- Are broadband access services included in a bundle with other services in a separate market from broadband access services purchased as a stand-alone service? This would be the case if consumers did not regard bundled and unbundled services as substitutes.

A8.97 In terms of the first bullet, with no wholesale broadband regulation, it is likely to not be possible for other operators to bundle retail broadband services with other communications services as they would first require access to the upstream wholesale inputs. In this case, only Virgin Media and BT would be able to bundle retail services as a result of complementarities at the wholesale level. It is also likely that they would offer both the bundled service as well as the stand-alone services.

A8.98 The services typically included in the bundle are not often cluster goods. In a scenario where a consumer is given the opportunity to purchase services as a bundle or separately it is often observed that while some customers do indeed purchase a bundle, others choose to unpick the bundle and purchase the separate components separately. That is to say that at least some consumers would view them as separate purchase decisions. We therefore do not consider it appropriate to include all other service elements in the product definition.

A8.99 Turning to the second bullet, if the price of the stand-alone broadband service increased whilst the price of the bundled service remained the same, it is likely that consumers would opt for the bundled service as long as they required the other elements in the bundle as well. This is because the underlying broadband service is the same. Indeed, 61 per cent of those surveyed said that the price offered was the reason they purchased a bundled service. This would suggest that the bundled package includes the broadband service should be included in the product market definition.

A8.100 For business customers, buying internet service bundles is less prevalent. Our consumer survey shows that 6 per cent of businesses purchase from a systems integrator as part of a package or a bundle of services. The majority of businesses (80 per cent) purchase their internet services directly from the provider (i.e., as a stand-alone service), whilst others (10 per cent) buy from resellers.

A8.101 At the wholesale level, there are even less opportunities for operators to bundle wholesale broadband products with other offerings, since each service element of the bundle would not be considered as substitutes.

A8.102 We noted that the market share analysis is unaffected of the choice between a 'stand-alone' products' or 'bundles' market definition. This is because both definitions would have included bundled and individual service elements. In addition, in line with the Commission's EM, we recognised the need to consider the linkages with the prices of bundled products with those of other communications products as part of the SMP analysis.

A8.103 We therefore propose that:

- There is no separate market for bundled services; and
- Other services included in service bundles (such as fixed voice services, mobile voice and data services and pay TV) should not be included in the product market definition.

Annex 9

Sub-loop unbundling - detailed analysis

Introduction

A9.1 This annex sets out our analysis of the economics of sub-loop unbundling (SLU). In particular we focus on the likely cost increases associated with having more than one communications provider (CP) deploying equipment in BT's street cabinets. The cost increase of these additional deployments is known as the static cost of competition.

A9.2 We start off by calculating the cost for one CP to deploy equipment in BT's street cabinets in order to meet a certain assumed demand for FTTC-based services. We then calculate the total cost for multiple CPs (two, three and four) to deploy equipment in BT's street cabinets in order to meet the same assumed demand for FTTC-based services. The static cost of competition is then calculated by taking the difference between the total cost for multiple CPs and the cost for a single CP.

A9.3 When calculating the total cost for multiple CPs to deploy equipment in BT's street cabinets, we have assessed two different deployment scenarios:

- Scenario 1: all CPs host their equipment in their own separate cabinet, and
- Scenario 2: the equipment of all CPs (including BT) is hosted in the same shared cabinet, with each CP deploying its own mini-DSLAM.

A9.4 There are significant fixed and upfront costs associated with deploying equipment in street cabinets. However, to ease understanding we have amortised these costs and spread them over the end user base, this has allowed us to present the costs on a per end user per month basis.

Model Assumptions

A9.5 Our modelling was based on the following main parameters: 290 end user line cabinets[148], 20 per cent FTTC take-up[149], roll-out to 20,000 cabinets[150], migration and churn rate of 20 per cent[151], straight line depreciation for equipment and assets[152], investment period of five years, and market share was split evenly based on the number of CPs using the services[153].

[148] Based on BT's current average number of end user premises connected to a cabinet.
[149] This estimate is based on the following assumptions: Total broadband penetration will increase to 80% from 65% today; FTTC will be mainly rolled out in cable areas; Cable penetration in cabled areas will remain at 30%; LLU penetration in cabled areas will drop from 35% to 30% as a result of competitive pressure. Current penetration figures have been estimated based on Ofcom's Communications Market Report 2009.
[150] This is an estimate based on BT's NGA rollout announcements (approximately 27,000) and adjusted to reflect the fact that CPs will not be interested to invest in all cabinets.
[151] This figure is based on consumer broadband switch rates as reported in the Communications Market Report 2009 and household moves as reported by National Statistics for 2009.
[152] The depreciation method is straight line. The depreciation period we have used for electronic equipment is 5 years, for cabinet infrastructure 10 years and 20 years for ducts.
[153] We are aware that market share per CP at a cabinet could vary, and this method is intended to provide an estimate of average market share in this case.

A9.6 We have modelled the cost for one CP to deploy equipment in the street cabinets in order to meet all the expected demand for FTTC-based services. We have also modelled the total cost for multiple CPs (two, three, and four) to deploy equipment in the street cabinets in order to meet the same assumed demand for FTTC-based services. The increase in cost associated with having additional CP is the static cost of competition.

A9.7 This analysis does not include the cost of backhaul from the cabinet. To the extent that total backhaul costs increase as the number of CPs increases, then this will further increase the static cost of competition associated with having multiple competing FTTC networks.

A9.8 We have, however, included estimates of the costs of engineering and designing new processes arising from new systems to assist and support multiple CPs each deploying a FTTC network.

A9.9 Our cost estimates are based on discussions with industry stakeholders, publicly available information and our own internal knowledge and assumptions.

Results of our analysis

Scenario 1: Each CP deploys equipment in its own 'separate' cabinet

A9.10 Our modelling suggests that there is a significant incremental cost arising from having multiple CPs deploying equipment in their own 'separate' cabinets. We have calculated the costs associated with additional CPs under this scenario, and these are set out in Figure A9.1.

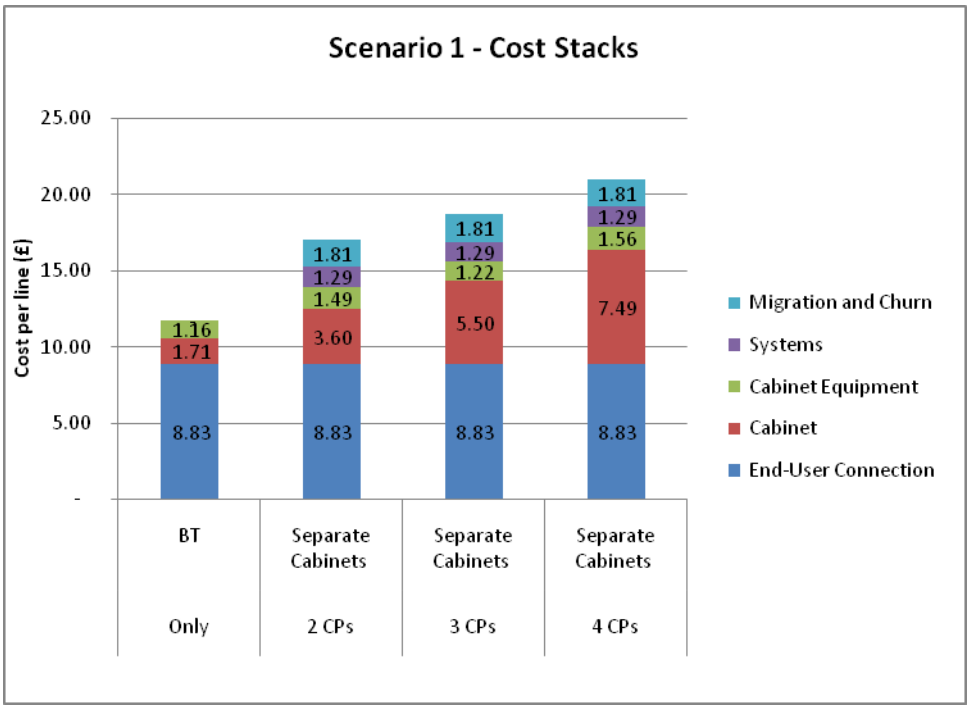
Figure A9.1 Static cost of competition - separate cabinets

Number of CPs	Cost (per end user per month)	Increase in cost from 1 CP
1	£11.70	0
2	£17.02	46%
3	£18.66	60%
4	£20.98	79%

A9.11 This indicates that the static cost of competition for just one other CP in addition to BT results in an additional cost increase of at least 46 per cent per month per end user line. This is the minimum cost hurdle that would need to be overcome to enable competition, and it is likely that this cost would eventually be passed on to consumers.

A9.12 Figure A9.2 illustrates the main cost components in the FTTC cost stacks where there are one, two, three or four 4 CPs providing services.

Figure A9.2 Cost components in FTTC cost stacks – scenario 1



A9.13 We have undertaken sensitivity of analysis for Scenario 1 to identify the main cost drivers, and used BT plus two CPs as the base case scenario. The results of our analysis are in Figure A9.3 below.

A9.14 Figure A9.3 indicates there the two main cost drivers of the model are the expected take-up of FTTC services by end users and the costs of establishing a cabinet. If there is lower take-up, this significantly increases static costs, however if take-up is higher, there is a relatively small decrease in cost. If the cabinet costs increase or decrease, this has an equal and significant impact of changing the overall costs by 15 per cent. The level of migration and churn did not have a significant impact on the overall cost, and nor did the level of equipment costs.

A9.15 The costs associated with duplicated equipment could be higher, due to fragmented demand leading to low utilisation rates driving up the per unit costs and that CPs would generally install equipment with capacity in excess of what is currently required. The level of utilisation required is a large determinant of the per user per line equipment costs, which could vary by CP, and is also affected by the number of CPs in a cabinet.

Scenario 2: Each CP deploys equipment in the same 'shared' cabinet

A9.16 Whilst the incremental cost of having multiple CPs is less in this scenario, compared with separate cabinets, our modelling still suggests that it is high. We have calculated the costs associated with additional CPs under this scenario, these are set out in Figure A9.4.

A9.17 This indicates that the static cost of competition for one other CP in addition to BT results in an additional cost increase of at least 34 per cent per month per end user line. This is the minimum cost hurdle that would be required to be overcome to enable competition, and it is likely that this cost would eventually be passed on to consumers.

Figure A9.3 Sensitivity table for Scenario 1

Sensitivity	Value	Cost per line per month	% Change in cost from base case
FTTC take-up	10%	£26.56	+42%
	20%*	£18.66	0
	30%	£16.62	-11%
Migration and churn rate	10%	£17.75	-5%
	20%*	£18.66	0
	30%	£19.56	+5%
Proportion of base case cabinet costs	50%	£15.91	-15%
	100%*	£18.66	0
	150%	£21.41	+15%
Proportion of base case CP equipment	50%	£18.04	-3%
	100%*	£18.66	0
	150%	£19.27	+3%

**This represents the value in the base case Scenario 1*

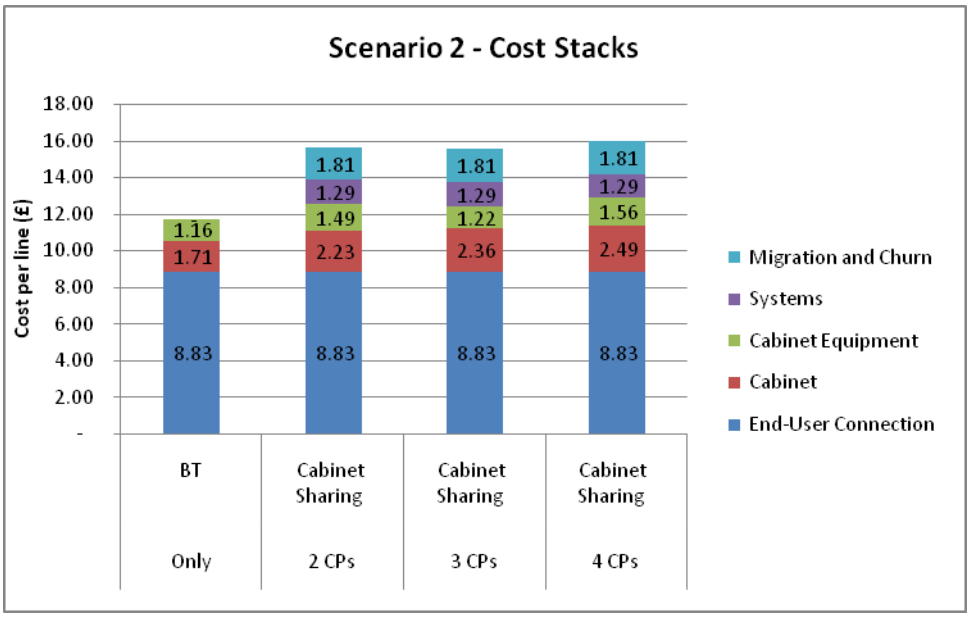
Figure A9.4 Static cost of competition – shared cabinet

Number of CPs	Cost (per end user per month)	Increase in cost from 1 CP
1	£11.70	0
2	£15.64	34%
3	£15.52	33%
4	£15.98	37%

A9.18 This indicates that the static cost of competition for one other CP in addition to BT results in an additional cost increase of at least 34 per cent per month per end user line. This is the minimum cost hurdle that would be required to be overcome to enable competition, and it is likely that this cost would eventually be passed on to consumers.

A9.19 Figure A9.5 illustrates the main cost components in the FTTC cost stacks where there are one, two, three or four CPs providing services.

Figure A9.5 Cost components in FTTC cost stacks – scenario 2



A9.20 We have undertaken a sensitivity analysis to identify the main cost drivers for Scenario 2 and used BT plus two CPs as the base case scenario. The results of our analysis are in Figure A9.6.

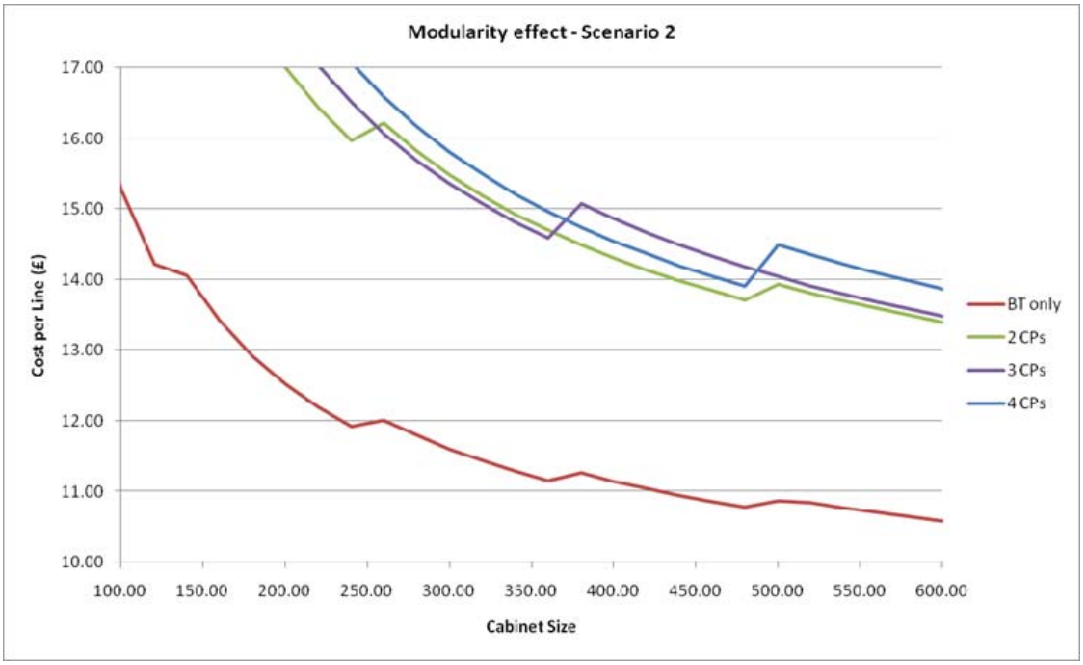
Figure A9.6 Sensitivity table for Scenario 2

Sensitivity	Value	Cost per line per month	% Change in cost from base case
FTTC take-up	10%	£20.28	+31%
	20%*	£15.52	0
	30%	£14.53	-6%
Migration and churn rate	10%	£14.61	-6%
	20%*	£15.52	0
	30%	£16.42	+6%
Proportion of base case cabinet costs	50%	£14.34	-8%
	100%*	£15.52	0
	150%	£16.70	+8%
Proportion of base case CP equipment costs	50%	£14.90	-4%
	100%*	£15.52	0
	150%	£16.13	+4%

**This represents the value in the base case Scenario 2*

A9.21 We note that the cost per end user per line is slightly lower for three CPs than with two. This is due to the modularity of CP equipment assumed in the modelling. As the minimum unit of cabinet equipment is assumed to support more than one line, the gradual cost reduction with increasing cabinet size and/or take-up assumption is disrupted by temporary increases when new equipment needs to be installed but remains under-utilised. These cost increments occur at different points for different number of CPs. As illustrated in Figure A9.7, while on average the cost curves increases with the number of CPs, they occasionally cross at particular points.

Figure A9.7 Illustration of equipment modularity effect



Conclusion

A9.22 Our model indicates that there is a significant increase in static cost as the number of competing FTTC networks increases for both scenarios. Even under Scenario 2, there were significant incremental costs arising from establishing shared cabinets despite costs being spread over a greater number of CPs than if a separate cabinet was required.

A9.23 Even if we assume that several improving factors simultaneously occur, e.g., higher FTTC take-up by end users, a significant reduction in cabinet and equipment costs, there are still high static costs of competition that must be overcome.

A9.24 Based on this analysis and given the current uncertain demand for FTTC-based services it is our view that, for the period of this review, we are unlikely to see significant deployment of multiple competing FTTC networks in a given area.

Annex 10

Physical infrastructure access - detailed analysis

Introduction

A10.1 As part our work on super-fast broadband we commissioned Analysys Mason to conduct a sample survey of BT's telecoms duct in order to better understand the technical feasibility of duct access. Following full cooperation from BT, this survey was completed in December 2008 and Analysys Mason's report[154] was published on our website alongside the Super-fast Broadband statement[155].

A10.2 The survey examined the duct infrastructure on urban and suburban routes between the metro node, the exchange and the street cabinet which are generally known as the exchange side or E-side of BT's network. These routes were considered to be most relevant to FTTC as it is these parts of the network that need upgrading for such a deployment. The findings of this survey are particularly relevant to our considerations here and are summarised in paragraph A10.6 below.

A10.3 In order to better understand the technical feasibility of infrastructure access for the remaining parts of BT's access network, we commissioned Analysys Mason to undertake a second sample survey, focusing on routes located between cabinets and customer premises which are generally referred to as the distribution side or 'D-Side' of BT's access network. Following full cooperation from BT, this survey was completed in January 2010 and Analysys Mason's report is being published on our website alongside this consultation[156].

A10.4 To further inform our policy on physical infrastructure access, we also commissioned CSMG to undertake a piece of economic analysis which aimed to provide an insight into the costs drivers of duct access and whether it may support competition and investment. This work comprised international case studies on duct access pricing; comparisons of costs of competition and market entry, between duct access and a non-physical wholesale product. CSMG's report is being published on our website alongside this consultation[157]. The study also includes research into duct construction costs.

A10.5 We have also studied the operational processes connected with infrastructure sharing processes in other countries, and have summarised our findings at the end of this annex.

[154] http://www.ofcom.org.uk/telecoms/discussnga/duct/ductreport.pdf
[155] Telecoms infrastructure access – sample survey of duct access by Analysys Mason, March 2009 http://www.ofcom.org.uk/telecoms/discussnga/duct/
[156] Sample survey of ducts and poles in the UK access network by Analysys Mason, January 2010 - published on our website as a link from this consultation document
[157] Economics of Shared Infrastructure Access by CSMG, February 2010 - published on our website as a link from this consultation document

The results from our first duct survey shows there is significant amounts of unoccupied space in existing ducts in BT's network between metro nodes and street cabinets

A10.6 The survey covered 817 chambers and 18,000 duct ends, involved opening up BT's chambers and inspecting the occupation of ducts running from the chamber wall. BT's pole infrastructure was not examined as part of this survey as we understand from BT that less that 1 per cent of this part of its network is carried overhead. This suggests that for FTTC deployments poles will be of little or no relevance.

A10.7 The survey therefore observed duct availability along contiguous routes between a BT 'metro node' and a 'last cabinet' before the customer premises. In total 31 routes were surveyed, spread across 11 UK towns/cities[158] and totalling 143km in length. They were chosen so as to be geographically representative of the 27 BT 'districts'; account for the age of Openreach's infrastructure (new towns versus old towns) and also to allow for urban/suburban characteristics (capital city, other major city, coastal city, etc.).

A10.8 The raw results from our observations shows that a significant amount of existing space is currently unoccupied in the surveyed duct ends:

- 78 per cent of ducts have sufficient unoccupied space to allow at least 1 additional 25mm diameter sub-duct to be inserted;
- 51 per cent of ducts have space that would allow 3 additional sub-ducts;
- 22 per cent of ducts are full; and
- 27 per cent of ducts are empty.

A10.9 It is important to note that the availability of space underlying these average figures varied significantly across the duct survey sample. The results showed considerable variation across the different cities and towns that were studied. The availability figure also tended to be lower closer to the customer, with the average of space for three or more sub-ducts being 52 per cent on surveyed routes between metro nodes and exchanges but reducing to 39 per cent between the exchange and cabinet.

A10.10 The raw survey data needs to be interpreted carefully. Although all efforts were made to ensure the sample was as representative as possible, it only accounts for around 0.02 per cent of BT's total duct assets and is therefore not large enough to be statistically reflective of the whole network. We consider that the results are indicative, but no firm conclusions can be drawn about the unoccupied space in the majority of ducts that were not surveyed.

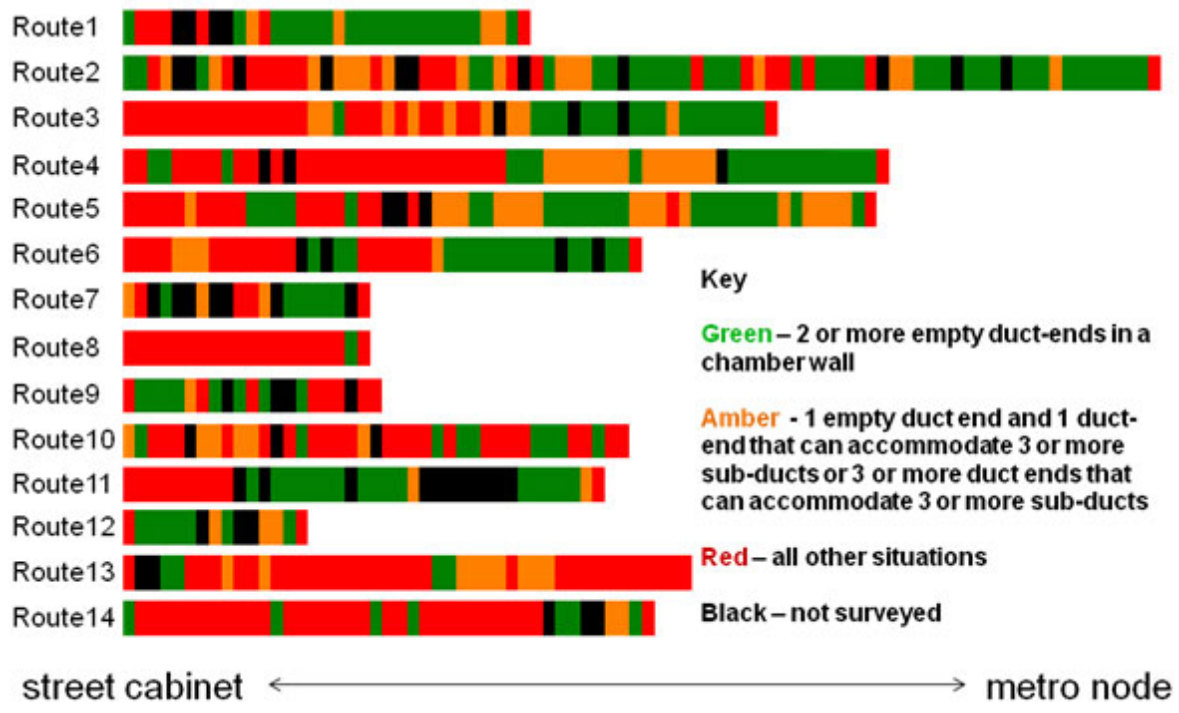
A10.11 Even in the areas that were surveyed, using the observed space to deploy end to end networks may be difficult:

- the results are based on the space observed at the duct ends only, not all of it will be usable for installing new cables, for example due to blockages deeper into the duct or cable access problems in the chamber; and

[158] Surveys were conducted in Birmingham, Cardiff, Crawley, Croydon, Glasgow, Leeds, Manchester, Milton Keynes, Peterborough, Southampton and London

- some of the spare space is required by BT for operational maintenance and planned capacity growth; and there may not be contiguous unoccupied duct space on any end to end route. A given route, for example between a telephone exchange and a street cabinet, consists of many segments – individual duct runs between pairs of chambers. Among the surveyed routes, although average duct space may be high, some segments have very little unoccupied space and therefore may not be useable for the installation of new cables. This is illustrated in Figure A10.1 for 14 of the routes surveyed. The red segments have the least unoccupied space, and therefore the highest risk of being unsuitable for reuse.

Figure A10.1 Segment by segment illustration of unoccupied space in E-side ducts from duct survey



The results from our second duct survey shows there is significant amounts of unoccupied space in existing ducts and on poles in BT's network between cabinets and customer premises

A10.12 In the D-side of the BT's access network, poles are used much more than in E-side of the network, comprising around 12 per cent of the overall route length of the network. They are also commonly used in the 'final-drop' (the last few metres of the access network which connects to individual houses) serving around 50 per cent of all homes. These sections of the network require an upgrade from copper to fibre in the case of FTTH deployment and therefore pole access may be particularly interesting to operators considering this. Our survey therefore encompassed poles as well as ducts and chambers.

A10.13 In order to be as indicative as possible of the national infrastructure network in urban and sub-urban areas the survey covered 7 selected locations[159] in the UK and encompassed 552 chambers, 320 poles, 3293 dropwires and 135 buildings with internal or external DPs.

A10.14 There are two types of ducts in this part of BT's access network, serving different purposes:

- 90mm diameter duct used in the main routes of the access network (excluding the last drop); and
- 50mm diameter ducts used mainly for the last drop of underground-fed wires, and the lead-in to overhead DPs (to connect end customers to the distribution network)[160].

A10.15 The raw results from the 90mm duct-end observations shows that a significant amount of existing space is currently unoccupied in the surveyed D-side ducts:

- 87 per cent of ducts have sufficient unoccupied space to allow at least 1 additional 25mm diameter sub-duct to be inserted;
- 63 per cent of ducts have space that would allow 3 additional sub-ducts;
- 13 per cent of ducts are full; and
- 8 per cent of ducts are empty.

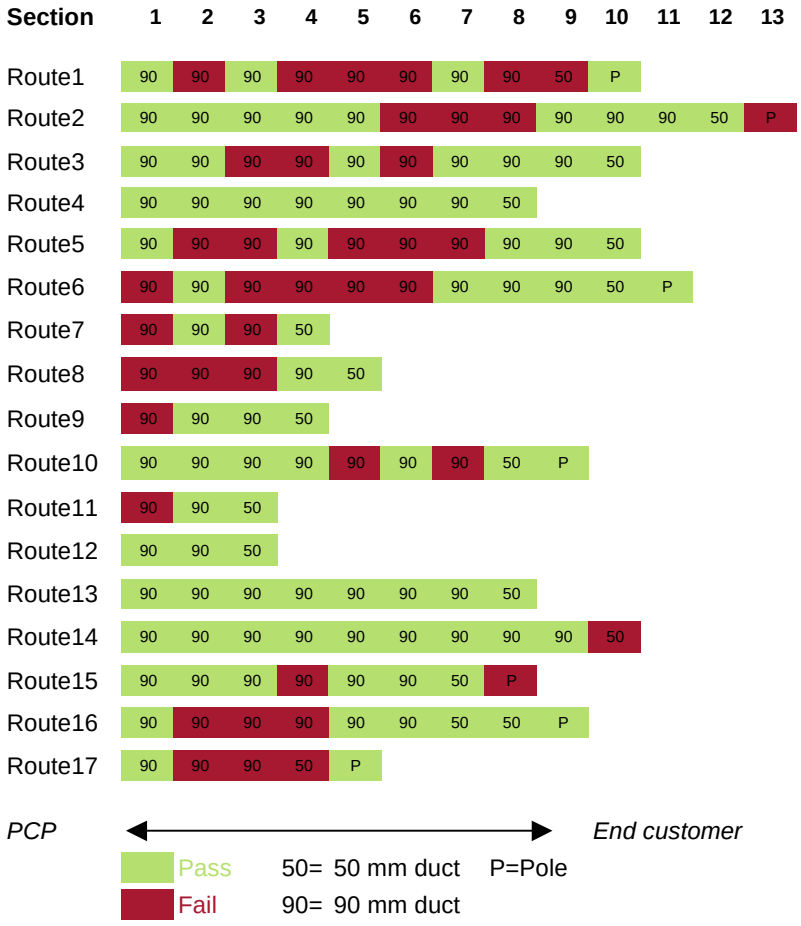
A10.16 Compared with the E-side observations from the first survey, the average number of duct ends per chamber is much lower, but the average number of cables per duct end is similar. There is also more unoccupied space per duct end compared to the E-side. This is because on the D-side, the installed cables tend to be smaller cables than on the E-side, but they both use similar duct sizes (i.e., 90mm diameter duct).

A10.17 For the smaller 50mm ducts, the raw results from the observations also show a significant amount of existing space is currently unoccupied with 69 per cent of the ducts have 70 per cent or more unoccupied space. For the last drop, the vast majority of the cables within the 50mm lead-in ducts are less than 15mm in diameter leaving a significant amount of unoccupied space within ducts despite their smaller diameter.

A10.18 The analysis of route continuity between cabinets and DPs indicated that despite the overall high level of unoccupied space, that individual duct runs between pairs of chambers sometimes have very little unoccupied space and therefore may not be useable for the installation of new cables. This is illustrated in Figure A10.2 for 17 of the routes surveyed. The red segments have the least unoccupied space, and therefore the highest risk of being unsuitable for reuse.

[159] Surveys were conducted in Cardiff, Glasgow, Manchester (two areas), Milton Keynes (two areas) and London.
[160] According to BT, smaller ducts (e.g., 25mm diameter) may also be present in this part of the network for infrastructure deployed before 1968 but none were observed in the survey.

Figure A10.2 Segment by segment illustration of unoccupied space in D-side ducts from duct survey



A10.19 Figure A10.2 shows that only 3 of the 17 routes surveyed had unoccupied space in all segments along the route and most lacked unoccupied space in multiple sections.

A10.20 The raw results of the observations of spare capacity on poles, also showed significant amounts of unoccupied capacity in the overhead infrastructure that delivers the last drop to end customers:

- 85 per cent of the poles surveyed could accommodate at least one additional dropwire;
- 63 per cent of the poles surveyed could accommodate at least double the amount of wires that is currently installed;
- 58 per cent of dwellings are served by a pole that can accommodate at least one additional dropwire for every dwelling served off the pole without modifying the existing pole infrastructure; and
- 25 per cent of the dwellings are served by a pole that can accommodate at least two additional dropwires for all dwellings served of the pole.

A10.21 As with the first survey, the raw results need to be interpreted carefully. Although as all efforts were made to ensure the sample was as representative as possible, it only accounts for small faction of BT's total assets in this part of the network (0.0013 per cent of chambers and 0.008 per cent of poles) and is not therefore large enough to be statistically reflective of the whole network. We consider that the results are indicative, but no firm conclusions may be drawn about the unoccupied space in the majority of ducts and poles that were not surveyed.

A10.22 Even in the areas surveyed, using the observed space in ducts to deploy networks may be difficult for the reasons discussed in paragraph A10.11 above. A further factor is that we understand from BT that a significant minority of D-side cables are buried directly in the ground so there is no duct infrastructure to share.

A10.23 In addition, the unoccupied capacity observed on poles may not translate directly to usable spare capacity since the results were calculated using BT's current engineering rules for the existing single occupancy network. In practice it is likely that the rules would need to be adapted for multiple occupancy or different cable specifications. The most important factors here are:

- The loading characteristics of new fibre cables, e.g., diameter, weight, wind loading and breaking-strain. For its calculations, Analysys Mason used the loading characteristics of existing copper dropwires due to the lack of information regarding the characteristics of aerial fibre cables. If fibre cables place a greater loading on poles then the usable capacity could be significantly reduced; and

- The space available at the top of poles to accommodate additional fibre termination boxes may be limited due to the need to leave space for technicians to work safely at height. If this proves to be the case, usable capacity could be further reduced.

Infrastructure access would also present practical challenges

A10.24 In addition to providing an insight into the availability of ducts and poles, both surveys sought to better understand some of the operational challenges involved.

A10.25 The survey team encountered a number of operational issues in the underground sections of the network that would affect a deployment such as:

- chambers containing water and/or sewage that were inaccessible until pumped out;

- chambers containing flammable gas, requiring ventilation before they could be safely entered;

- BT drawings that are complex and not kept up to date resulting in difficulties locating some chambers. Also Ordinance Survey maps to relate duct drawings to the surroundings were unavailable on some routes;

- overgrown chambers that needed to be cleared;

- small footway chambers had been entirely filled with earth due to rainwater washing into the chamber;

- chamber depths that required scaffolding and harnesses to access;

- chamber access problems, for example due to location in busy pavements at pedestrian crossings and vehicles and building sites on top of chambers; and

- other restrictions such as lead time to get a work permit for chambers in a carriageway.

A10.26 The survey team also encountered operational difficulties in relation to poles. The main one being poles located in the proximity of trees that could obstruct access to the pole or the installation and maintenance of overhead wires. Of the poles surveyed, 21 per cent were located in close proximity to trees and Analysys Mason concluded that dealing with trees would be one of the major operational difficulties facing CPs that wish to use poles for new infrastructure deployment.

Critical Success Factors

A10.27 We asked Analysys Mason to use its experience from the surveys to consider the critical success factors in any future duct and pole access product. As a result, they have proposed a set of recommended next steps which would be required to develop duct and pole access into a workable product. There is more detail on this in the second survey report, but in summary:

- development of engineering rules to dictate how unoccupied space may be used by a CP for both ducts and poles;

- development of a duct and pole access framework, providing key end-to-end processes involved in a duct access product;

- development of a governance model for CPs with a single poiont of contact in a multi-infrastructure provider environment;

- development of training programmes for field forces to ensure they are properly qualified for all tasks involved in duct and pole access; and

- development of a reference database containing up to date digitised network plans, including duct and pole records useable by both infrastructure providers and CPs.

Our economic study evaluated the static cost of competition for infrastructure sharing and also considered market entry options for individual CPs

A10.28 The main aim of the CSMG study was to examine the economics of shared infrastructure access from two perspectives:

- firstly in terms of the static cost of competition that would be created through infrastructure competition based on duct access (i.e., the overall additional cost collectively incurred by CPs from duplicative investment in network infrastructure); and

- secondly by comparing the economics of duct access-based network deployment with alternative market entry options for an individual CP considering market entry.

CSMG researched five international examples of shared infrastructure access

A10.29 CSMG researched international examples of shared infrastructure access and developed five case studies of countries in which regulated or commercial offers are present. The countries profiled were: Australia, Canada, France, Portugal and the USA.

A10.30 The case studies found that infrastructure sharing arrangements were long-established features in each of these countries except France where it has been introduced more recently. In each of these countries, there was some form of regulatory intervention in support of infrastructure sharing, although in Australia and the USA, commercial arrangements predominated with regulation providing a safeguard in cases where commercial arrangements could not be agreed.

A10.31 CSMG also researched duct access charges in each of these markets and used the findings as inputs to its economic analysis of infrastructure sharing.

A10.32 Figure A10.3 summarises the key findings of the case studies.

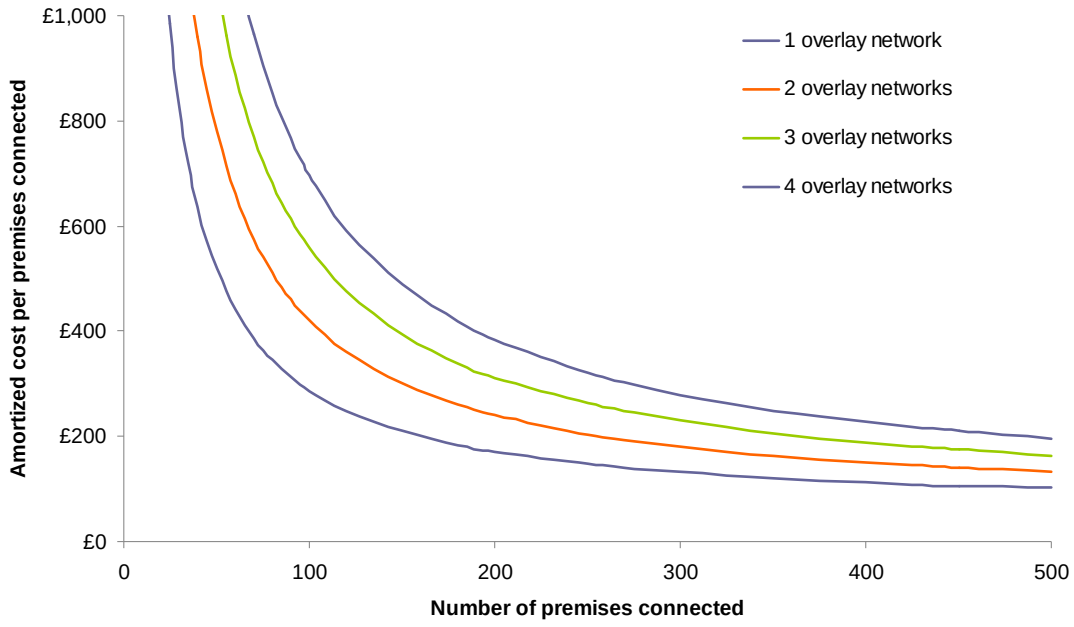
Duplicative investment in fibre and active elements results in a significant static cost of competition for infrastructure sharing

A10.33 The static cost of competition analysis shows that considerable cost can be avoided through infrastructure sharing compared with new build duct deployment. However, whilst infrastructure sharing would avoid duplicative investment in duct networks, CPs would continue to duplicate investment in the fibre and active elements of their networks which drives up the cost of competition. CSMG's analysis showed that this cost would be significant. In the scenario modelled by CSMG, having four competing networks instead of one would result in the cost per end user more than doubling. Figure A10.4 illustrates the static cost of competition for the urban cabinet district modelled.

Figure A10.3 Summary of international case study findings

Country	Regulated / Unregulated	Date introduced	Pricing Summary	Examples of Additional Charges	Level of Adoption
Australia	• Regulatory requirement • Commercially negotiated with regulatory fallback	• Commercially since 1990s • Facilities Access Code introduced in 1999	• AU$6.95 / metre / year	• Feasibility study • Inspection of installation	• Popular, but little in last mile
Canada	• Regulatory requirement • Pricing set by NRA	• Since 1950s	• Duct: CAN$27.00 / 30m / year • Pole: CAN$9.60 / yr	• Surveys • Make ready work	• Cable operator use high
France	• Regulated offer • Pricing set by NRA	• Paris sewers since 1990s or earlier • FT reference offer introduced 2008	• €1.20 / meter / cm^2	• €278 per study • Supervision from €79 / hour	• 700km of FT at Sept. 09
Portugal	• Regulated offer • Pricing set by NRA	• Since 1990s • PT reference offer introduced 2006	• €7.50 - €10.60 / month / km / cm2	• Database access • Admin tasks	• 12,000km of PT duct at Oct. 2008
USA	• Regulatory requirement • Commercially negotiated with regulatory fallback	• FCC regulation since 1978	• Duct: $0.50-$5.00 / metre / year • Pole: $5-20 / year	• Surveys • Make ready work	• Believed to be high

Figure A10.4 Annualised cost per connection to industry - urban geotype[161]



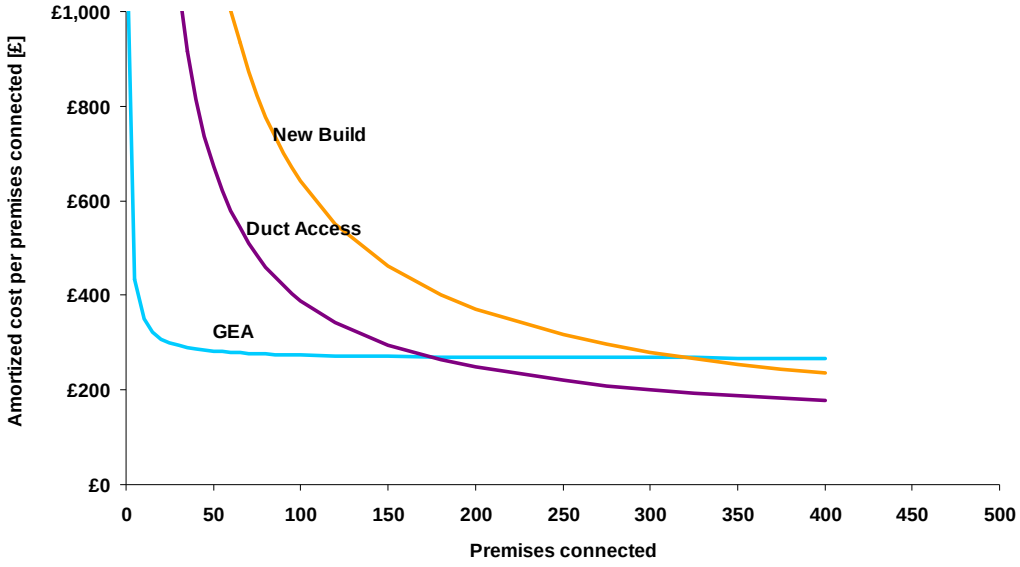
Infrastructure sharing offered savings compared with a complete new-build deployment but compared less favourably with a non-physical wholesale service

A10.34 CSMG found that from the perspective of an individual CP, that infrastructure sharing offers significant cost savings compared with deploying a new duct network, making infrastructure sharing attractive to CPs committed to infrastructure deployment. However, infrastructure sharing compared less favourably with an active wholesale product in many circumstances. For its analysis, CSMG used the Openreach GEA service.

A10.35 CSMG found that GEA has much a lower upfront cost for CPs compared with an infrastructure sharing-based network deployment. GEA would also be cheaper except at high levels of take-up. For the central case modelled, CSMG found that at current prices, the point at which a infrastructure sharing-based network would breakeven with GEA was 24 per cent of all homes in the urban cabinet district modelled and 45 per cent of all households for the suburban cabinet district modelled. CSMG concluded that in areas where GEA is deployed it would be likely to be more attractive to CPs, particularly in the face of uncertain demand for NGA services. Figure A10.5 below illustrates the annualised cost per home connected using new build, duct access and GEA for the urban geotype modelled by CSMG.

[161] A cabinet in an urban area serving 500 premises

Figure A10.5 Annualised cost per home connected to CP[162]



A10.36 The results of the analysis need to be interpreted carefully. In particular it is worth noting that:

- charges for duct access are based on benchmarks from the international case studies and may not be representative of charges in the UK;
- BT's GEA product at current prices was used as an example of a non-physical wholesale product for the market entry analysis. Future changes to GEA prices would affect the analysis;
- new build and to a lesser extent duct access costs are sensitive to duct construction costs which can vary considerably according to the terrain (e.g., carriageway, footpath, verge etc). In practice it is likely that costs would tend to be higher in urban environments where more expensive carriageway work is required. The final section of the CSMG report examines these civil works costs in detail as discussed below; and
- the urban and suburban cabinet districts modelled were larger than the UK average of 290 premises at 500 and 400 premises respectively. At lower cabinet sizes, the economics of infrastructure-based network deployment would compare less favourably with GEA.

Duct construction costs were found to vary considerably

A10.37 CSMG also researched the cost of duct construction through a series of interviews with network operators and construction contractors. The cost estimates provided by the study participants showed considerable variation, by terrain type and trenching technology. Construction in city centres was found to have the highest cost, driven by factors such as traffic management, lane closures and the need to work during the night.

A10.38 CSMG thought that a relatively recent development called 'slot-trenching'[163] could become an important technology for NGA deployment as it is significantly cheaper

[162] A cabinet in an urban area serving 500 premises

than traditional trenching, having a 57 per cent lower cost than the average for traditional methods. Slot trenching is suitable for the installation of small diameter ducts (16mm to 20mm). Due to the small diameter and the shallow depth at which ducts are buried it may be better suited for the final reaches of distribution networks close to customer premises rather than more strategically important segments closer to exchanges.

Operational processes for physical infrastructure access

A10.39 Our research into PIAservices in other countries indicate that the operational processes are fairly generic and typically included the following:

- **Infrastructure location Information Provision** – in which the infrastructure owner supplies infrastructure maps for an area in response to an enquiry from a CP, enabling the CP to determine whether there is infrastructure in the locality that might suit the CP's needs;

- **Initial Capacity Evaluation** - Depending on the availability and state of maintenance of the infrastructure owner's capacity utilisation records, it may be able to make an initial assessment of the availability of spare capacity giving the CP an indication of the likelihood of spare capacity being available;

- **Survey** – it appears that infrastructure owners are generally not able to give a definitive view of space capacity from their records and therefore an onsite survey is often required to provide a more accurate view of spare capacity;

- **Ordering** - If the CP decides to proceed the next step would to place an order for the capacity with the infrastructure owner. The capacity would then be reserved for the access seeker for an agreed period;

- **Desaturation** – Where there is insufficient capacity to meet a CP's requirements, in some cases it may be possible for infrastructure owner to make space available either by recovering cables that are no longer in use or by consolidating services carried on several small cables into one new large cable that takes up less space overall than the existing cables;

- **Installation** - Once order confirmation is received, installation of the cables could proceed;

- **Record Updates –** Once the installation is complete there is often a requirement for the installer to confirm completion of the installation and also to specify any variations from the original order (for instance if a blockage is encountered a different duct might have been used);

- **Infrastructure Repair** – In some cases, cable installation may fail because of unforeseen faults such as blocked or collapsed ducts so there may also be a reactive repair process to rectify such problems; and

- **Cable Maintenance –** Following successful cable installation there is also a need for a process to facilitate ongoing cable maintenance. This would need to include arrangements for access to cables and also for the replacement of defective cables. The latter process would probably require CPs to be allowed to access additional duct capacity on a temporary basis to install new cables.

[163] Also known as micro-trenching.

BT's infrastructure records

A10.40 We understand that BT is in the process of digitising its external plant maps. The digitised maps are held on a Geographic Information System (GIS) called New Engineering Journeys (NEJ) . The digitisation programme is being undertaken on an area by area basis. At present records for areas covering approximately 25 per cent of the UK have been digitised. Records for the remainder of the UK are recorded on paper maps.

A10.41 We understand from BT that although has capacity utilisation records for its duct network these have not been fully maintained and do not therefore give a completely reliable picture of the spare capacity in BT's ducts.

A10.42 This suggests that it is likely that it would be necessary for the PIA service to include a survey process similar to that operated in other countries.

Annex 11

PIA reference offer requirements

Introduction

A11.1 As discussed in Sections 7 and 8, we are proposing that BT should be required to produce a RO for its PIA service. To ensure that the RO is fit-for-purpose we propose to specify a set of minimum requirements for the RO. In this annex, we consider those requirements.

A11.2 As our starting point, we have reviewed the list of requirements for existing ROs that is already specified in SMP Condition FA4.

A11.3 With the exception of condition FA4.3 which applies only to LLU, as currently drafted all of the clauses in Condition FA4 apply to all Network Access. We have therefore considered whether these requirements would be appropriate for PIAand whether any additional conditions would be appropriate.

Standard reference offer features

A11.4 Condition FA4.2 specifies a set of standard features for ROs that apply to all existing Network Access services. We consider that these features would also be present in a well designed RO for PIA and therefore propose that FA4.2 should apply to PIA in its current form.

Service level commitments and compensation payments

A11.5 SLAs form part of commercial contracts and set out a supplier's commitment to provide services to an agreed quality, e.g., within a specified period. The associated SLGs specify the level of compensation that the customer would be entitled to should the service not be provided at the quality specified in the SLA, e.g., if delivery of the service was late. Together they are therefore essential elements of any commercial contract as they provide the supplier with an incentive to deliver service to a pre-defined and, potentially, pre-agreed level of performance or compensate their customer accordingly.

A11.6 SLAs and SLGs are already specified as a standard requirement for the existing WLA market remedies and we consider it would be appropriate for these obligations to apply to the PIA obligation as well.

A11.7 Since the current requirements were specified, we have undertaken further work on SLAs and SLGs. We therefore also consider that the compensation payments payable for failures to meet the SLGs should be in accordance with the general principles set out in our March 2008 Statement entitled *Service Level Guarantees: Incentivising Performance*[164]. In particular, we consider that the arrangements should:

- when agreed service levels are not met, make provision for compensation to be made based on a pre-estimate of an average CP's loss;

[164] http://www.ofcom.org.uk/consult/condocs/slg/statement/

- ensure that CPs are entitled to make a claim for additional loss;
- pay compensation on a per event basis;
- ensure that compensation payments are made proactively; and
- efficient cost recovery should be permitted.

PIA Specific Features

A11.8 Based on our studies of other duct sharing services we consider that in addition to the standard requirements listed above, BT's RO should include at minimum the following:

- An infrastructure information process – enabling CPs to obtain information such as diagrams, maps and other information showing the location of BT access network physical infrastructure;
- A description of the permitted uses of the physical infrastructure;
- Technical specifications for infrastructure access including:
  - technical specifications for cables and associated equipment;
  - cable installation, attachment and recovery methods;
- the methodology for calculating availability of spare capacity;
- procedures for the provision of information to CPs about spare capacity including arrangements for visual surveys of physical infrastructure to determine spare capacity;
- processes for capacity reservation with a requirement that they should apply equally to BT and OCPs;
- Processes for the installation and recovery of cables and associated equipment;
- arrangements for relieving congested physical infrastructure, including the repair of existing faulty infrastructure and the construction of new physical infrastructure;
- arrangements for co-investment in new infrastructure, including a process for announcement by BT of new infrastructure projects and arrangements for CPs to request provision of additional capacity;
- conditions for CPs to access to BT physical infrastructure including if appropriate training, certification and authorisation requirements for personnel permitted to access and work in/on infrastructure;
- Maintenance arrangements – a process to facilitate maintenance of cables after installation, including provision for the temporary occupation of additional infrastructure capacity for the installation of replacement cables; and

- In the interests of transparency, conditions for the inspection of infrastructure at which access is available or at which access has been refused on grounds of lack of capacity.

Publication and notification requirements

A11.9 Conditions FA4.4 to FA4.10 specify requirements for publication of ROs and also for notifications of changes etc. We consider these standard requirements should also apply to PIA.

Annex 12

Glossary

Access Network: The part of the network that connects directly to customers from the local telephone exchange.

Active Line Access (ALA): a form of wholesale bitstream access, offers CPs scope for innovation and retail product differentiation which is as close as possible to that allowable by physical infrastructure access.

ADSL (Asymmetric Digital Subscriber Line): a digital technology that allows the local loop to send a large quantity of data in one direction and a lesser quantity in the other.

Aggregation Point (AP): a point in the network (such as a local serving exchange) connected to the access network allowing a CP to multiple end user premises.

Analogue Telephony Adaptor (ATA): a device that provides a conventional analogue telephone interface to an Internet Protocol communications network.

Backhaul: Connection from the first access node (for example the local exchange or street cabinet) to the core network.

Broadband: a service or connection which is capable of supporting always-on services which provide the end user with high data transfer speeds.

Cable modem: a cable modem is a device that enables a consumer to access the Internet via a cable access line

Carrier pre-selection (CPS): a mechanism that allows consumers who have a BT line to select, in advance, alternative communications providers to carry some or all of their telephone calls without having to dial a prefix

Co-location: the provision of space at a BT MDF site that enables a competing provider to locate equipment within that MDF site in order to connect to the dominant provider and purchase LLU services. For the avoidance of doubt, co-location includes co-mingling.

Co-mingling: a type of co-location where a competing provider's equipment is located in the same area as the dominant provider could or does house its own equipment, without a permanent barrier between them.

Communications provider (CP): a person who provides an Electronic Communications Network or provides an Electronic Communications Service.

Core Network: The backbone of a communications network, which carries different services such as voice or data around the country.

Current Generation Access (CGA): a copper-based access network that can support a maximum download speed of 24 Mbit/s.

Customer Premises Equipment (CPE): any terminal and associated equipment that is connected to an electronic communications service at customers' premises. Equipment is often provided and connected by consumers and includes for example, telephones, answering machines, and modems.

Digital: the binary coded representation of a waveform, as opposed to analogue, which is the direct representation of a waveform.

DOCSIS (Data Over Cable Service Interface Specification): The international standards for sending data over a cable network.

DSL (**Digital Subscriber Line):** a family of technologies generically referred to as DSL, or xDSL, capable of transforming ordinary local loops into high-speed digital lines, capable of supporting advanced services such as fast Internet access and video-on-demand. ADSL (Asymmetric Digital Subscriber Line), HDSL (High bit rate Digital Subscriber Line) and VDSL (Very high bit rate Digital Subscriber Line) are all variants of xDSL.

DSLAM (Digital Subscriber Loop Access Multiplexer): apparatus used to terminate DSL enabled local loops, which comprises a bank of DSL modems and a multiplexer which combines many local loops into one data path.

Ducts: Existing pipes which hold copper and fibre lines.

Duct Access: When service providers other than the owners of telecommunications ducts can access existing pipes to deliver connections to end customers. In practice, communications providers can pull their own cables through the existing pipes without needing to dig new trenches and lay new ducting.

External tie cable: the provision of links that connect the local loop to the equipment of a competing provider outside a MDF site.

European Regulators Group (ERG):
A former group of national regulators within Europe, of which Ofcom was a member.

Equivalence of Inputs (EOI): a principle that BT will provide the same input products and services on the same timescales, terms and conditions (including price and service levels), by means of the same systems and processes and by providing the same information to CPs on an equivalent basis to itself (including BT's own downstream divisions).

Fibre-to–the-Cabinet (FTTC): An access network structure in which the optical fibre extends from the exchange to the cabinet. The street cabinet is usually located only a few hundred metres from the subscriber's premises. The remaining part of the access network from the cabinet to the customer is usually copper wire but could use another technology, such as wireless.

Fibre-to-the-Premises (FTTP):
An access network structure in which the optical fibre network runs from the local exchange to the end user's house or business premise. The optical fibre may be point-to-point – there is one dedicated fibre connection for each home – or may use a shared infrastructure such as a GPON. Sometimes also referred to as Fibre To The Home (FTTH).

Generic Ethernet Access (GEA): BT's wholesale non-physical product providing CPs with access to higher speed broadband products

Gigabit Passive Optical Network (GPON): A shared fibre network architecture that can be used for NGA.

Hull Area: the area defined as the 'Licensed Area' in the licence granted on 30 November 1987 by the Secretary of State under section 7 of the

Telecommunications Act 1984 to Kingston upon Hull City Council and Kingston Communications (Hull) plc.

Integrated services digital network (ISDN): a set of communications standards for digital transmission of voice, video, data, and other network services over the traditional circuits of the PSTN.

Internal tie cable: the provision of links that connect the local loop to the equipment of a competing provider within an MDF site.

KCOM: KCOM Group plc, formerly known as Kingston Communications plc.

KPIs (key performance indicators): statistics used to measure performance, such as the time to provide services and repair faults

Local loop: the access network connection between the customer's premises and the local serving exchange, usually comprised of two copper wires twisted together.

Local loop unbundling (LLU): a process by which a dominant provider's local loops are physically disconnected from its network and connected to competing provider's networks. This enables operators other than the incumbent to use the local loop to provide services directly to customers.

Local Serving Exchange (LSE): A building which houses electronic equipment that connects telephone calls. Backhaul links from a CP are terminated here to connect internet access links to end user premises.

Main distribution frame (MDF)/unbundled local loop: the equipment where local loops terminate and cross connection to competing providers' equipment can be made by flexible jumpers.

Metallic Path Facilities (MPF): the provision of access to the copper wires from the customer premises to a BT MDF that covers the full available frequency range, including both narrowband and broadband channels, allowing a competing provider to provide the customer with both voice and/or data services over such copper wires.

Modem: abbreviation of modulate-demodulate, a device that converts a digital signal into analogue for transmission purposes. It also receives analogue transmissions and converts them back to digital.

Narrowband: a service or connection that provides a maximum speed of up to 64 kbit/s per circuit (and therefore up to 128 kbit/s in the case of ISDN2). Narrowband modems generally offer a maximum rate of 56 kbit/s.

Next Generation Access: New or upgraded access networks that will allow substantial improvements in broadband speeds and quality of service compared to today's services. This can be based on a number of technologies including cable, fixed wireless and mobile. Most often used to refer to networks using fibre optic technology.

Network Termination Equipment (NTE): a terminal device installed at a consumer's premises that provides access to an electronic communications network. Typically the device will have one or more sockets into which consumers can connect CPE.

Non-physical Access: Wholesale access to the network infrastructure through electronic equipment.

Office of the Telecoms Adjudicator (OTA): an independent body that facilitates discussion between CPs on operational issues related to new and existing telecoms products and services.

Open ATA: a requirement that includes control over CPE for interconnecting CPs, allowing greater flexibility in the provision of downstream products and services.

Passive Optical Network (PON): is where a single fibre from the exchange is shared by several end users by means of a passive optical splitter which is deployed somewhere between the local serving exchange and the end users premises.

Physical Access: Wholesale access products based on direct access to the physical infrastructure of the network (e.g., copper, fibre, duct), without the need to connect to electronic equipment.

Physical Infrastructure Access (PIA): a proposed obligation under which BT would be required to allow OCPs to deploy NGA networks in the physical infrastructure of its access network.

PSTN: Public Switched Telephone Network

Reference offer (RO): provides a set of minimum conditions for an SMP operator to develop products or services for the use of OCPs.

Shared metallic path facility (SMPF)/shared access: the provision of access to the copper wires from the customer's premises to a BT MDF that allows a competing provider to provide the customer with broadband services, while the dominant provider continues to provide the customer with conventional narrowband communications.

Site access: the provision of access to BT's MDF sites in order for a competing provider to install and operate equipment within those MDF sites;

SMP: The Significant Market Power test is set out in European Directives. It is used by National Regulatory Authorities (NRAs) such as Ofcom to identify those communications providers who must meet additional obligations under the relevant Directive.

Splitter: A piece of equipment which splits a single access connection into multiple connections.

Service Level Agreements (SLA): form part of commercial contracts and set out a supplier's commitment to provide services to an agreed quality, e.g., within a specified period.

Service Level Guarantees (SLG): specify the level of compensation that the customer would be entitled to should the service not be provided at the quality specified in the SLA

Sub-loop unbundling (SLU): Like local loop unbundling (LLU), except that communications providers interconnect at a point between the exchange and the end user, usually at the cabinet.

Statement of Requirements (SOR): is a requirement that allows CPs to make a request to the SMP operator for the provision of a service. It requires the SMP operator to publish reasonable guidelines on requesting a new product, the provide information for the purpose

of making a request for a new product, and design a process for dealing with requests for new products.

Undertaking: is the SMP operator.

Voice over NGA (VoNGA): is the provision of voice products and services over NGA.

Virtual Private Network (VPN): is a secure private network that uses the Internet to connect remote end users with a company's network.

Virtual Unbundled Local Access (VULA): it provides a connection from the nearest 'local' aggregation point to the customer premise.

Wide Area Network (WAN): is a geographically dispersed network where end users are distantly located from each other.

Wholesale Broadband Access (WBA): is between the WLA market and retail market for provision of fixed telecommunications services to end users.

Wholesale Line Rental (WLR): is the fixed telecommunications voice service delivered over the PSTN that CPs provide to end users at the retail level.

Wholesale Local Access (WLA): covers fixed telecommunications infrastructure, specifically the physical connection between end users' premises and a local exchange.

Worldwide Interoperability for Microwave Access (WiMAX): (the Worldwide Interoperability for Microwave access): A wireless technology, similar to WiFi, but with a longer range which can cover many kilometres. WiMAX has been considered as a wireless alternative to fixed access connections to provide high speed access links instead of using copper to properties.