Business Connectivity Market Review

Review of competition in the provision of leased lines

Redacted for publication [✂]

Consultation

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About this document

Ofcom's Business Connectivity Market Review examines the markets for the provision of leased lines to businesses in the UK.

Leased lines are high-quality, dedicated, point-to-point data transmission services used by businesses and providers of communications services. As well as being essential components of many businesses communications systems, they are also essential to support the provision of mobile telephone and fixed residential broadband services.

Every three years, Ofcom conducts a review of competition in the markets for the provision of leased lines in the UK. Where we find that a provider has "significant market power" (SMP) in a market (i.e. that they are able to act independently of competition) we impose regulations designed to address concerns about the impact of that market power on competition.

This document is a consultation in relation to the current review. It sets out our provisional analysis of the market and identifies segments of the market in which we propose that a provider has SMP. The document also sets out what regulations we propose to impose to address such SMP.

We will take all responses to this consultation into account before reaching our final conclusions, which we expect to publish in early 2016.

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Section 1

Executive Summary

Introduction

1.1 Leased lines are important components of business Information and Communications Technology (ICT) services, particularly those used by large multi-sited enterprises and Government organisations. They also play a significant role in delivering fixed and mobile broadband services to consumers, as communications providers (CPs) use them extensively in their networks. We define them as services which provide dedicated transmission capacity between fixed locations.

1.2 This document is a consultation on our current review of competition in the provision of leased lines in the UK. We carry out this review, known as the Business Connectivity Market Review (BCMR), every three years, in accordance with the EU regulatory framework for telecommunications, which is implemented in the UK by the Communications Act 2003 (the Act).

1.3 The overall aim of our work in the BCMR is to ensure that the interests of end-users are protected and to promote effective competition, efficient investment, innovation and choice for their benefit.

1.4 Charge controls on a number of BT's wholesale leased line products are an integral part of our proposals. The details of the proposed application of the relevant charge controls therefore form an important part of our overall analysis, and we will set out their quantitative impact in our Leased Lines Charge Control Consultation which we plan to publish in June.

1.5 We note that in our Annual Plan we identified as a priority the need to ensure effective competition in the provision of communications services for small and medium enterprises (SMEs). We would like to be clear that the proposals in this consultation are designed to support competition at a wider level, and are not aimed at addressing some of the more specific challenges faced by SMEs. We expect to publish shortly a document setting out steps we intend to take for improving outcomes for SMEs.

Market context

1.6 Bandwidth consumption by businesses and by private users continues to increase. An increasing number of enterprises host their computing infrastructure in remote data-centres ('cloud' computing), and consumption of streamed video, at home, at work and on the move, is growing rapidly.

1.7 The increasing demand for bandwidth is driving up volumes of high-capacity leased lines, which require optical fibre and fast optoelectronic equipment. However, not all businesses require high capacities, and leased lines serve many different applications, reflected in the very wide range of bandwidths available.

1.8 Most modern leased lines use Ethernet technology, and some very high bandwidth services use wavelength-division multiplex (WDM) technology, which allows a single fibre to carry multiple services simultaneously. Some older services provide either an

analogue interface or digital time-division multiplex (TDM) interfaces, using legacy equipment which is no longer manufactured.

1.9 In this review, we refer to the modern technologies collectively as Contemporary Interface (or CI), and to the legacy technologies collectively as Traditional Interface (or TI).

The review process

1.10 Our market review process has three formal stages. First, we define each relevant market in terms of its product and geographic scope. Then we assess whether any CP has a position of significant market power (SMP) in any of the relevant markets, which, in essence, means that it would be able to operate in the market without effective constraint from competition. Finally, we assess which regulatory remedies we should impose to address competition concerns that arise from any SMP finding.

1.11 We completed the last BCMR in 2013, and set out our findings in a Statement which we published in March 2013.[1]

1.12 Before starting our substantive analysis under this review, we published on 1 April 2014 a Call for Inputs (CFI) to set out our plan for the review and to gather stakeholders' views on topics which we thought were likely to be particularly important. [2,3]

1.13 We said in the CFI that we intended to consider whether we should impose passive remedies in the event that we find that BT has SMP, and asked for stakeholders' views. Passive remedies are regulatory rules which require a network operator to offer access to the physical elements of its network, such as underground ducts and/or optical fibres, which would allow CPs to choose and install their own electronic equipment in delivering services to end-users. Current rules, known as 'active remedies', require BT to offer CPs fully functional leased line services on regulated wholesale terms, using its own electronic equipment.

1.14 We also asked for stakeholders' views in the CFI about the following topics:

i) concerns that had arisen in relation to the quality of BT's provision of wholesale Ethernet leased line services;

ii) the effectiveness of the controls we imposed on BT's charges for leased lines in 2013 and any changes we should consider in designing any new controls;

iii) whether we should continue to regulate the provision of retail very-low-bandwidth TI services; and

iv) the extent to which broadband services, particularly those based on next-generation access technologies such as fibre-to-the-cabinet, can substitute for leased line services.

[1] See *Business connectivity market review - Final statement*, 28 March 2013, available at http://stakeholders.ofcom.org.uk/consultations/business-connectivity-mr/final-statement/
[2] See *Business connectivity market review – Timetable and initial call for inputs*, 1 April 2014, available at http://stakeholders.ofcom.org.uk/binaries/consultations/business-connectivity-market-review/summary/Business-Connectivity-Market-Review.pdf
[3] Annex 5 lists the respondents to all consultations we published as part of the BCMR so far.

1.15 Following publication of the CFI, we gathered further evidence to inform our review by conducting market research, holding extensive discussions with industry stakeholders and analysing a large amount of data which CPs provided in response to our formal requests for information about their networks and services. We also reviewed relevant publicly-available information.

1.16 In October 2014 we published for consultation our initial analysis of the data we gathered from CPs on their network coverage and level of activity in the BCMR market.[4]

1.17 In November 2014 we published a preliminary consultation on passive remedies.[5] In that document we sought further input from stakeholders to inform our considerations, particularly regarding:

- the framework for assessing the role of passive remedies in the BCMR;
- the potential costs and benefits of passive remedies at a broad level; and
- high-level aspects of the design and scope of any passive access product, including pricing issues.

Proposals

Market analysis

1.18 Competing in the provision of wholesale leased lines requires substantial long-term investment in local access infrastructure of exchanges, underground ducts and fibre cables. We consider that, absent regulation, business consumers have an effective choice of providers only in those geographic areas where multiple competing CPs operate such infrastructure in close proximity to customer sites. Elsewhere there is an enduring competition bottleneck. We also consider that variations in competitive conditions in the sale of particular product segments, which are underpinned solely by differences in electronic equipment, such as technology and bandwidth, are likely to be transient.

1.19 The table below illustrates the degree of choice of alternative infrastructure available in the geographies which we propose to delineate for the purposes of market definition.

[4] See *Business Connectivity Market Review – Consultation on data analysis*, 8 October 2014, available at http://stakeholders.ofcom.org.uk/binaries/consultations/bcmr-data-analysis/summary/BCMR_Data_Consultation.pdf

[5] *See Business Connectivity Market Review – Preliminary consultation on passive remedies*, 5 November 2015, available at http://stakeholders.ofcom.org.uk/binaries/consultations/bcmr-passives/summary/BCMR_passives.pdf

Table 1.1: Proportion of businesses within 100m of BT's competitors' networks

Number of competitors' networks	Central London Area	London Periphery	Rest of UK (exc. Hull)
At least 1	100%	96%	61%
At least 2	99%	68%	15%
At least 3	98%	40%	5%
At least 4	93%	22%	2%
At least 5	83%	11%	0%

Markets we propose to deregulate

1.20 We propose to deregulate sectors of the market in which our analysis has identified that there is sufficient choice of alternative infrastructure to ensure that end-users can be protected by effective and sustainable competition. In particular, we propose not to regulate the provision of:

i) any Contemporary Interface (CI) leased lines in the Central London Area; and

ii) any long-distance leased lines between a set of identified core network nodes, consisting of 60 large data-centres and 181 BT exchanges.[6]

1.21 In addition, we recognise that volumes of Traditional Interface (TI) services are declining rapidly and that users can often choose modern alternatives. We therefore propose to deregulate the provision of the following types of TI leased lines:

i) retail analogue services and retail digital services operating at bandwidths below 2Mbit/s; and

ii) wholesale services operating at bandwidths above 8Mbit/s.

1.22 We have published a separate consultation document regarding the retail TI services which we are proposing to deregulate.[7] While some operators of critical national infrastructure, such as water and electricity utilities, still use these ageing services, BT is planning to withdraw them. We want to ensure that end-users are aware both of BT's plans and of our proposals, so that they can arrange to migrate to more modern and sustainable alternatives if they are not already doing so.

Markets we propose to regulate

1.23 On the basis of our analysis, we propose to define leased lines markets and find SMP as shown in the table below.

[6] The set of core network nodes identified by the regulations currently in force consists of 85 BT exchanges.

[7] See Business Connectivity Market Review, very-low-bandwidth leased lines, 15 May 2015, available at http://stakeholders.ofcom.org.uk/consultations/very-low-bandwidth/

Table 1.2: Proposed market definitions and SMP findings

		Retail services		Wholesale terminating segments			
Interface technology	Bandwidth (Mbit/s)	Hull	Rest of UK	Central London Area	London Periphery	Rest of UK	Hull
Traditional (TI)	Low: <=8	KCOM	*No SMP*	BT			KCOM
Contemporary (CI)	All bandwidths	KCOM	*No SMP*	*No SMP*	BT	BT	KCOM

Approach to remedies

1.24 In order to remedy the competition problems we have identified, we propose to impose the types of *ex ante* obligations set out in sections 87 and 88 of the Act, including:

- network access;
- price controls;
- non-discrimination; and
- transparency.

1.25 Our approach to the design of remedies is to regulate access to BT's and KCOM's networks where they have SMP, in order to protect consumers and to promote effective competition, innovation and choice in downstream markets, while promoting competition upstream, where this is sustainable, based on efficient investment in alternative infrastructure.

Assessment of passive remedies

1.26 We have been considering whether we should include passive remedies in the package of remedies for wholesale markets for CI terminating segments in which BT has SMP.

1.27 Following careful consideration, we propose to require BT to provide access to dark fibre, but not to its ducts. We consider that our proposed requirement would achieve an appropriate balance between delivering significant benefits while mitigating the risks inherent in imposing passive remedies.

1.28 We note that CPs would continue to rely on active remedies during this review period (2016-2019) and probably beyond, and therefore assumed that any passive remedies we may impose would co-exist with active remedies. Accordingly, we have assessed the merits of a package of remedies that would include both passive and active remedies relative to what we consider could be achieved if we only use active remedies.

1.29 We carry out this assessment taking into account the impact of passive remedies over the long term, noting that the impacts are likely to arise mainly beyond the 2016-2019 review period. This is consistent with our duty to take into account the need to secure effective competition in the long term.

1.30 In our current view, passive remedies could deliver important benefits to support our overall aim more effectively than an actives-only remedies package. Increased innovation is likely to be a key benefit, because passive access would enable greater competitive differentiation and faster development, and could stimulate the emergence of new technical solutions. Passive remedies could provide CPs with opportunities to reduce overall equipment costs, and may also allow us to simplify regulation in the longer term.

1.31 At the same time, we recognise that imposing passive remedies would carry significant risks relative to an actives-only remedies package. The risks could arise particularly because any passive remedies would co-exist with active remedies for an extended period, and include:

- inefficient entry incentivised by regulatory arbitrage opportunities, which could result from any inconsistencies between the pricing of active and passive products;
- reduced incentives for CPs and BT to invest in infrastructure;
- reduced opportunity for BT to recover its efficiently incurred costs, including common costs;
- distributional impacts, in which some end-users would benefit from lower prices while others would pay more.

1.32 The relative pricing of active and passive remedies would be a key driver of how and where passive remedies are used, and of their ultimate impact on competition and consumers. In our current view, an obligation on BT to provide dark fibre priced in a manner consistent with its 1Gbit/s wholesale Ethernet services would be the most appropriate passive remedy. We consider that inclusion of this remedy in our package of remedies would deliver most of the benefits of passive access while addressing the risks of inefficient entry and reduced investment incentives, and limiting appropriately the extent of any distributional impacts between different end-users.

1.33 We also consider that we can ensure that BT would continue to have a fair opportunity to recover its efficiently incurred costs, including its common costs, by including dark fibre in the product set we model in designing the controls we propose to apply to BT's charges. We plan to publish a separate consultation on our proposals for these controls in June.

1.34 We do not propose to require BT to provide access to its ducts. We consider that any additional benefits that we could achieve in this review by requiring that BT provides access to its ducts as a remedy to its SMP in leased lines are likely to be limited. At the same time, we consider that with a duct access remedy we would not be able to mitigate the risks described above as effectively as with a dark fibre remedy. In our current view, a dark fibre remedy would achieve a better balance overall between benefits and risks in addressing the competition issues which we have identified in leased lines markets.

1.35 In making these proposals we have taken into account that the EU Civil Infrastructure Directive (CID) is expected to come into effect in the UK in summer 2016. The CID will introduce a requirement for all utility networks to meet reasonable requests for access to their infrastructure from public communications network operators made

with a view to deploying high speed electronic communications networks. However, the CID does not provide for dark fibre access.

1.36 We have taken account of the CID in our assessment of competition in the relevant markets, and consider that it is not likely to have a material impact on our proposed findings of market power.

1.37 We have also taken the existence of the CID into account in considering what remedies it may be appropriate to impose to address the competition problems identified. The CID will be a form of duct access remedy which will sit alongside any remedies we impose as part of this market review. However, as explained above, we do not consider it appropriate to rely on a duct access remedy, and we therefore do not consider that the CID changes our provisional assessment that it is appropriate to impose a dark fibre remedy in this BCMR.

Assessment of BT's quality of service in providing Ethernet leased lines

1.38 We consider that BT's quality of service in providing wholesale Ethernet leased line services is not acceptable. Provisioning performance since 2011 has deteriorated and currently shows little sign of sustained improvement. We also consider that whilst the quality of BT's repairs of these services is broadly acceptable, this too could easily decline if BT were to choose to divert resources to improve the quality of provision.

1.39 BT has recognised these problems, and we support the work it has been undertaking with the industry to address the issues. BT is developing changes to its order handling processes and systems to enable performance improvements. The timescales of these developments are currently uncertain.

1.40 Nevertheless, we consider that regulatory and contractual arrangements currently in force for wholesale Ethernet leased line services are not sufficient to ensure that BT maintains appropriate standards of quality to support effective downstream competition and to protect end users.

1.41 Therefore, we propose to impose obligations on BT to ensure that it has appropriate incentives to improve its provision of wholesale Ethernet leased line services and to do so without degrading its repair performance.

1.42 Our research shows that although end users would like BT to deliver their services within shorter lead-times, they attach greater importance to certainty that BT will deliver those services on agreed dates. Accordingly, we propose that BT should be required to adhere to two sets of minimum standards.

1.43 Firstly, we propose a minimum standard of certainty of delivery date which would require BT to improve on its current performance from Year 1 of the review period, as shown in the table below.

Table 1.3: Proposed minimum standard for order completion by agreed date

		New minimum standard		
	Current performance (2014)	**Performance over Year 1 (2016/17)**	**Performance over Year 2 (2017/18)**	**Performance over Year 3 (2018/19)**
% of orders completed on or before initial Contractual Delivery Date	circa 45%	80%	85%	90%

1.44 Secondly, we propose minimum standards of provision lead-times and of repair, as shown in the table below. The proposals would require BT to deliver improvements in its provision lead-times from Year 2 of the review period, and to maintain at least its current repair performance throughout the review period.

Table 1.4: Proposed minimum standards of provision lead times and repair

			New minimum standard		
	2011 performance	**Current performance (2014)**	**Performance over Year 1 (2016/17)**	**Performance over Year 2 (2017/18)**	**Performance over Year 3 (2018/19)**
Mean time to provide across orders	40 working days	46 working days	No more than 46 working days	No more than 40 working days	As Year 2
Lower percentile limit	40% of provisions delivered in 29 working days	40% of provisions delivered in 30 working days	At least 40% of provisions delivered in 30 working days or less	At least 40% of provisions delivered in 29 working days or less	As Year 2
Upper percentile limit	3% of provisions delivered in 118 or more working days	3% of provisions delivered in 159 or more working days	No more than 3% of provisions delivered in 159 or more working days	No more than 3% of provisions delivered in 118 or more working days	As Year 2
% faults fixed within 5 hours	93.1%	94.4% (Jan'14 to Jul'14)	At least 94% of faults fixed within 5 hours	As Year 1	As Year 1

1.45 In assessing what a reasonable ultimate average lead time target for BT would be over the period of this market review, we have taken into account evidence from end user research and practices in other European member states, as well as Openreach's historic Ethernet service performance levels prior to their degradation.

1.46 We have not proposed that BT should be required to deliver improvements in lead-times before Year 2 because we recognise the greater priority which end-users and CPs attach to addressing the issue of certainty in delivery dates. We have taken into account that, in developing its order handling processes and systems over the next few years to meet our proposed requirements, BT would need to improve certainty of delivery dates, reduce lead-times and deliver new dark fibre products. BT would

nevertheless be required to ensure that it at least maintains its current lead-time performance in Year 1. In practice, we consider that in order for BT to prepare itself to meet the minimum standards applying to lead times in Year 2, it will likely need to out-perform its Year 1 lead time obligations and therefore these should be seen as an absolute floor rather than an expected performance standard.

1.47 We further propose to:

- require BT to provide specified key performance indicators (KPIs) for its main Ethernet services; and
- maintain obligations on BT to offer its current set of service-level agreements and guarantees (SLA/SLG) until it negotiates with the industry a new set of SLAs/SLGs based on the new provisioning process that is currently being trialled.

1.48 In addition, we set out our expectation for the process of negotiating new, or modifications to existing SLAs/SLGs.

Summary of remedies we propose to impose on BT

1.49 In addition to dark fibre and minimum standards of quality of Ethernet services, we propose to impose on BT similar obligations to those currently in force, including requirements to provide wholesale TI and CI leased line services on regulated terms.

1.50 In particular, we propose to impose an established full package of remedies, including charge control, on BT's provision of wholesale TI services of bandwidths <=8Mbit/s throughout the UK, except the Hull area; and, to impose on BT the remedies summarised in the table below for its provision of wholesale CI services in the geographic markets in which it has SMP.

Table 1.5: Overview of remedies proposals in wholesale markets CI markets in which BT would have SMP

Remedies	UK, except London and Hull	London Periphery
Network access on reasonable request	Yes	Yes
Specific access remedies		
Dark fibre	Yes	Yes
Ethernet	Yes	Yes
Minimum Quality Standards for Ethernet	Yes	Yes
WDM	Yes	No
Price controls		
Dark fibre	Yes	Yes
Ethernet <1Gbit/s	Yes	Yes
Ethernet >1Gbit/s and WDM	Safeguard cap	No
Equivalence of Inputs		
Dark fibre	Yes	Yes
Ethernet	Yes	Yes
WDM	Yes	n/a
Other general access remedies, including: - No undue discrimination - Publication of reference offers - Notification of changes to charges, terms and conditions - Publication of technical information - Accounting separation	Yes	Yes
Develop new products	Yes	Yes
Ethernet Quality of Service	Yes	Yes

Remedies we propose to impose on KCOM in the Hull area

1.51 We propose to require KCOM to provide both wholesale and retail TI and Ethernet services in the Hull area on regulated terms, to address the competition problems which we have identified in that area. Our proposals are summarised in the table below.

Table 1.6: Summary of remedies we propose to impose on KCOM in the Hull area

Markets	Proposed remedies
Retail low bandwidth TI Retail CI	– Requirement to supply retail leased lines – Requirement not to discriminate unduly – Requirement to publish a reference offer, including charges, terms and conditions – Cost accounting – Requirement to produce a pricing transparency report
Wholesale low bandwidth TI Wholesale CI	– Requirement to provide network access on reasonable request – Requirement not to discriminate unduly – Requirement to publish a reference offer, including charges, terms and conditions – Requirement to notify changes to charges, terms and conditions – Requirement to notify changes to technical information – Requirements for accounting separation – Requirement to produce a pricing transparency report

Consultation and next steps

1.52 We invite comments from interested parties on the proposals in this document. The consultation period runs 11 weeks and the deadline for responses is 31 July 2015. We aim to publish our conclusions in the first quarter of calendar 2016.

1.53 We intend to publish a consultation on our charge control proposals in the next few weeks. The consultation periods for the two consultations will overlap to give stakeholders the opportunity to review the complete package of proposed remedies before responding.

Section 2

Background

Scope and purpose of this review

2.1 In the business connectivity market review (BCMR) we review competition in the markets for:

- the retail provision of leased lines in the UK; and
- the wholesale provision of terminating segments and trunk segments in the UK.

2.2 When referring to these markets as a whole and in general terms we use the term 'the leased lines market' or 'the leased lines markets'.

2.3 The purpose of the BCMR is threefold:

i) to identify and define the relevant markets;

ii) to assess the extent of competition in the relevant markets and determine whether any operator has Significant Market Power (SMP) in those markets; and

iii) where there has been a finding of SMP, to determine the appropriate remedies which should be imposed, based on the nature of the competition problems identified in the relevant markets.

2.4 We set out the market review process in summary below and we provide more detail in Annex 14. In the past the BCMR consultations and statements have often been followed by the leased lines charge control (LLCC) consultations and statements, although in the last BCMR[8] (the BCMR 2013) we combined the BCMR and LLCC statement. For the purpose of clarification, from a legal and procedural perspective, the LLCC is actually one part of the market review as a whole and falls under the third purpose set out above. As we explain in this consultation, we propose that charge controls form part of the appropriate remedies which should be imposed in some of the relevant markets to address the competition problems we have identified in those markets. We will be publishing a separate LLCC consultation shortly in which we set out in greater detail our reasons for this proposal, including the nature, form and duration of the proposed charge controls.

2.5 We have published a separate consultation setting out our proposals for very low bandwidth retail services.[9] The reason for this is that we are aware that some consumers of these services use them to support critical national infrastructure. These stakeholders may not have an interest in any other aspects of the BCMR and we therefore wanted to provide them with the opportunity to understand and comment on our proposals in an efficient and effective manner.

[8] Ofcom , *The Business Connectivity Market Review - Review of retail leased lines, wholesale symmetric broadband origination and wholesale trunk segments*, http://stakeholders.ofcom.org.uk/consultations/business-connectivity-mr/?a=0m
[9] http://stakeholders.ofcom.org.uk/consultations/very-low-bandwidth/

Last market review

2.6 In March 2013, we completed the BCMR 2013 in which we imposed certain regulatory obligations on BT and KCOM in those markets where they were found to have SMP. Table 2.1 below summarises the market definitions and SMP findings of the last BCMR. A number of separate leased lines markets were defined based on the capabilities of different technologies: traditional interface services, alternative interface services and multiple interface services.

Table 2.1: BCMR 2013 - Market definitions and SMP findings

		Retail Services		Wholesale Segments			
				Symmetric Broadband Origination			Trunk
Interface technology	Bandwidth (Mbit/s)	UK	Hull	The WECLA	UK except the WECLA and Hull	Hull	UK
Traditional (TI)	V Low: <2	BT	KCOM	BT		KCOM	National *No SMP* Regional BT
	Low: <=8						
	Med: >8, <=45			*No SMP*	BT	KCOM	
	High: >45, <=155			*No SMP*	BT	KCOM	
	Very High: 622			*No SMP*		KCOM	
Alternative (AI)	Low <=1,000		KCOM	BT	BT	KCOM	
Multiple (MI)	>1,000, and any if WDM at customer's premises			*No SMP*	BT		

2.7 Further information on the market definitions, SMP findings and remedies imposed on BT and KCOM, including the charge controls imposed on BT, can be found in the March 2013 BCMR Statement, which can be found on our website at the link below:

http://stakeholders.ofcom.org.uk/consultations/business-connectivity-mr/

2.8 Publications relating to previous BCMRs can be found on our website at the link below:

http://stakeholders.ofcom.org.uk/telecoms/ga-scheme/specific-conditions-entitlement/market-power/?pageNum=1#in-this-section

Call for Inputs consultation - summary

2.9 On 1 April 2014, before starting our substantive analysis in this review, we published a Call for Inputs[10] (the April 2014 CFI) to gather stakeholders' views on a number of key issues.

[10] http://stakeholders.ofcom.org.uk/binaries/consultations/business-connectivity-market-review/summary/Business-Connectivity-Market-Review.pdf

2.10 In the April 2014 CFI we announced the start of this review and provided stakeholders with an overview of the project timetable. In addition, we sought stakeholders' views on the following topics:

- our proposed approach to the review, in particular inviting stakeholders to inform us of any developments or prospective developments since the last BCMR;
- the proposed market questionnaire, which we had planned to use to explore market characteristics, developments and competitive conditions with communications providers (CPs);
- BT's quality of service in the delivery of wholesale leased lines, about which concerns have been raised to us by CPs;
- substitution of leased lines services with broadband services;
- passive remedies, including the feasibility of particular passive remedies, how they might be used and the benefits of such remedies might offer in comparison to active remedies;
- future regulation of the retail market for very low bandwidth TI services, in light of plans by BT to withdraw these services in the coming years; and
- our approach to any potential charge control remedy.

2.11 We discuss the responses to the April 2014 CFI at appropriate points throughout this document. The April 2014 CFI and non-confidential responses to it can be found on our website at the link below:

http://stakeholders.ofcom.org.uk/consultations/business-connectivity-market-review/

Data analysis consultation - summary

2.12 This BCMR draws on a wide range of evidence, including two significant and complex pieces of analysis: the network reach analysis and the service share analysis. Both of these were reliant on the collection and processing of large amounts of data from CPs, which was gathered over the course of several months.

2.13 On 8 October 2014, we published a Data Analysis Consultation[11] (the October 2014 BCMR Consultation) that explained what data we requested and the methodologies, assumptions and judgements we used to check and clean the data. We also presented an indicative set of network reach and service share calculations. In addition to publishing that consultation, we sent each CP a cleaned version of the data which they had provided, so that they could review the cleaning rules and assumptions we applied. This gave CPs an opportunity to identify any errors we made and to provide further information to improve the quality of the data.

2.14 Following the October 2014 BCMR Consultation, we made improvements to the network reach and service share analyses, and also commissioned an external audit of the computer models used in both analyses, to assure that they are robust and fit-for-purpose. We provide further details on our data analyses in Annex 15 and we

[11] http://stakeholders.ofcom.org.uk/binaries/consultations/bcmr-data-analysis/summary/BCMR_Data_Consultation.pdf

discuss the implications of the results in our assessment of market definition and SMP in Sections 4 to 6.

2.15 The October 2014 consultation and non-confidential responses to it can be found on our website at the link below:

http://stakeholders.ofcom.org.uk/consultations/bcmr-data-analysis/

Passive remedies consultation summary

2.16 On 5 November 2014 we published a Preliminary Consultation on Passive Remedies[12] (the November 2014 Consultation) to gather stakeholders' views on the work we had undertaken in assessing the potential impacts of implementing passive remedies in the leased lines markets.

2.17 As noted above, in the April 2014 CFI we sought stakeholders' views on passive remedies and the responses we received indicated that a number of stakeholders were interested in passive remedies. The purpose of the November 2014 Consultation was to seek input from stakeholders to help us develop options that both include and exclude passive remedies. This was to enable us to compare the ability of these options to address any competition problems found in the market review.

2.18 Specifically, we sought stakeholders' comments on the following areas:

- the framework we devised for assessing the role of passive remedies in our review;
- the potential costs and benefits of passive remedies at a broad level; and
- our high-level views of the design and scope of any passive access product, including pricing issues.

2.19 We discuss the responses to the November 2014 Consultation at appropriate points throughout this document. The consultation and non-confidential responses to it can be found on our website at the link below:

http://stakeholders.ofcom.org.uk/consultations/bcmr-passives/

Summary of business connectivity market research

2.20 We commissioned consultants BDRC to carry out a telephone survey of 615 businesses with ten or more employees across the UK which use business connectivity services. This was followed up with a small number of face-to-face "case study" interviews.

2.21 This survey was intended to help us understand end-users' preferences for business connectivity services and suppliers, and where possible establish how these have changed since the last review of business connectivity markets. The main objectives of this research were to inform us about:

[12] http://stakeholders.ofcom.org.uk/binaries/consultations/bcmr-passives/summary/BCMR_passives.pdf

- business end-users' current and future needs for business connectivity services;
- the services which businesses use and the suppliers they purchase them from;
- the different service characteristics which businesses value most;
- businesses' perceptions of which products are most capable of meeting their business connectivity needs; and
- businesses' perceptions of any barriers to switching between products.

2.22 The findings of this research have been published separately.[13]

2.23 In addition, we sent CPs a "market questionnaire" which asked for their views on market characteristics, developments and competitive conditions. This was intended to complement our data-based quantitative analysis with more qualitative evidence on, for example, operators' business plans and competitive strategies, as well as their views on the current and future direction of business connectivity markets. We followed up the responses we received by meeting some of the operators to help us understand their strategies and processes for setting prices.

2.24 Both these pieces of market research have informed our assessment of markets and competitive conditions in this review.

Summary of market research on quality of service

2.25 We commissioned consultants BDRC to carry out a telephone survey of 450 organisations that have an Ethernet leased line.

2.26 The purpose of the research was to help us understand the value businesses and public sector organisations place on those elements of service performance which are directly attributable to Openreach's service quality. Specifically the research sought to understand:

- Ethernet leased line users experiences of Ethernet provisioning and repair and whether the service was considered adequate in terms of speed and quality;
- establish what is considered a 'reasonable length of time' for providing a new connection and for fault repair;
- tolerances to timing delays, i.e. what would be an unreasonable period and how would end-users be likely to react to this (e.g. look for an alternative supplier);
- establish the relative importance end-users attach to key aspects of Ethernet provisioning and repair;
- determine willingness to pay for improvements to provision and repair services; and

[13] BDRC Continental, *Business Connectivity Services Review*, May 2015, http://stakeholders.ofcom.org.uk/binaries/consultations/bcmr-2015/annexes/BCMR_2014_report-bdrc.pdf

- determine how shortfalls in performance (timing or quality) influence end user perceptions of a CP and how likely they are to switch provider as a result of those shortfalls.

2.27 The results of the market research have been published separately.[14]

Information gathering process

2.28 Our analysis in this consultation and the proposals made are based on a number of sources: the information we routinely collect on these markets while carrying out our duties; submissions from stakeholders, including responses to the April 2014 CFI, the November 2014 Consultation, the October 2014 BCMR Consultation, and any other ad hoc submissions provided[15]; a programme of bespoke market research for this review; discussions with industry stakeholders; data supplied by CPs in response to formal information requests covering network, service, financial and customer data; and publicly available information (including material from investor presentations and analysts' reports).

2.29 In the course of this review we have sent formal information requests to BT, KCOM and a number of other CPs. These requests have covered a range of issues, including the supply and demand of leased lines throughout the UK. Our power to issue formal information requests is derived from s135 of the Communications Act 2003 (the Act), which allows us to require anyone to provide us with information that is needed for the purpose of identifying markets and carrying our market analyses.[16]

The regulatory framework

2.30 The regulatory framework has its basis in five EU Communications Directives, each of which have been implemented into national legislation. It imposes a number of obligations on the relevant national regulatory authorities (NRAs), such as Ofcom. One of these obligations is to carry out a market review. We set out the market review process and the regulatory framework in more detail in Annex 14. In this section we have set out, in summary, what the market review process involves.

The market review process

2.31 The review is carried out in three stages:

i) we identify and define the relevant markets;

ii) we assess whether any of the markets are effectively competitive, which involves assessing whether any operator has SMP in any of the relevant markets; and

iii) we assess the appropriate remedies which should be imposed, where there has been a finding of SMP, based on the nature of the competition problem identified in the relevant markets.

[14] BDRC Continental, *Quality of Service: Ethernet Leased Lines 2014*, May 2015, http://stakeholders.ofcom.org.uk/binaries/consultations/bcmr-2015/annexes/QoS_report_27th_April.pdf
[15] Where we refer in this document to having taken into account stakeholder consultation responses, this should be taken to include all such submissions, whether provided as part of a formal consultation response or otherwise.
[16] s135(3)(g).

2.32 In carrying out the review, we are obliged to define relevant markets "appropriate to national circumstances".[17] In so doing, we are also obliged to take "utmost account"[18] of the Recommendation[19] and SMP Guidelines.[20] More broadly, in carrying out the review (including assessing appropriate remedies), we are required to take utmost account of all applicable recommendations issued by the European Commission (the Commission) under Article 19(1) of the Framework Directive[21] and of applicable opinions, common positions, recommendations, guidelines, advice or regulatory best practice adopted by BEREC.[22]

The Recommendation and its application to this review

2.33 The Recommendation sets out those product and service markets which, at a European level, the Commission has identified as being susceptible to *ex ante* regulation. These markets are identified on the basis of the cumulative application of three criteria[23]:

- the presence of high and non-transitory barriers to entry;
- a market structure which does not tend towards effective competition within the relevant time horizon; and
- the insufficiency of competition law alone to adequately address the market failure(s) concerned.

2.34 The Recommendation contains a different list of markets to that of which we took utmost account in the BCMR 2013. Importantly though, the Commission continues to regard the leased lines market as warranting *ex ante* regulation at a European level.[24] We, as the UK NRA, in accordance with competition law and taking utmost account of the Recommendation, have defined the relevant markets appropriate to our national circumstances.[25] In this review, we focus on whether or not *ex ante* regulation of leased lines markets is warranted. We also consider services such as asymmetric broadband in our market analysis, to assess whether they provide a competitive constraint in the prices of leased lines. However, we do not assess competition in the other direction – i.e. whether leased lines-based services would constrain asymmetric broadband services – as this has already been considered in

[17] See Article 15(3) of the Framework Directive (Directive 2002/21/EC on a common regulatory framework for electronic communications networks and services, as amended).
[18] Ibid.
[19] 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 communications networks and services (2014/710/EU).
[20] 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).
[21] See also section 4A of the Communications Act 2003 (the Act).
[22] Body of European Regulators for Electronic Communications. See Article 3(3c) of the Framework Directive. See also Article 3(3) of the BEREC Regulation (Regulation (EC) No 1211/2009 of the European Parliament and of the Council of 25 November 2009 establishing the Body of European Regulators of Electronic Communications and the Office).
[23] See Recital 19 to the Recommendation.
[24] See Recital 25.
[25] See Recital 25 to the Recommendation.

our 2014 Wholesale Broadband Access review and, in light of this assessment, the appropriate *ex ante* regulation is already in place for these broadband services.[26]

2.35 The requirement to define relevant markets appropriate to national circumstances means we are free to identify relevant markets in the UK as susceptible to regulation other than those listed in the Recommendation.[27] However, where we do so, the Recommendation requires that for each relevant market we must show that the cumulative criteria are satisfied.[28]

2.36 All of the markets we are proposing to identify in this review fall in Market 4 of the Recommendation which is defined as "[w]holesale high-quality access provided at a fixed location",[29] apart from the retail markets identified in the Hull area. These are:

- The retail market for TI leased lines at bandwidths up to and including 8Mbit/s.
- The retail market for AI leased lines at bandwidths up to and including 1Gbit/s.

2.37 In the relevant sections of this consultation document we set out how the cumulative criteria are satisfied for each of these relevant markets set out above that we propose to define.

The SMP Guidelines and their application to this review

2.38 The SMP Guidelines include guidance on market definition, assessment of SMP and SMP designation. In the relevant sections of this consultation document we set out how we have taken the SMP Guidelines into account in reaching our proposals.

Forward look

2.39 Rather than just looking at the current position, market reviews look ahead to how competitive conditions may change in future. For this review we have taken a forward look of three years, reflecting the characteristics of the retail and wholesale markets and the factors likely to influence their competitive development. The forward look period also reflects the requirement in the EU Communications Directives that ordinarily market reviews should be conducted within three years of the previous review.[30]

2.40 This does not preclude us reviewing any of the markets earlier but, absent unforeseen developments, we anticipate that we would time the next market review to conclude three years after completion of the current review. We therefore propose that the charge controls that we will set out in the forthcoming LLCC June 2015 Consultation will apply for a period of three years following the completion of the BCMR and LLCC consultation process.

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[26] Ofcom's 2014 review of WBA markets is available at http://stakeholders.ofcom.org.uk/consultations/review-wba-markets/statement/. In the WBA 2014 review, we found that asymmetric broadband services sold to businesses were part of the WBA product market whilst leased lines were not part of the WBA market. In the WBA 2014 review, in light of our market definition and SMP assessment, we imposed appropriate remedies for those asymmetric broadband markets.
[27] See Recital 21 to the Recommendation.
[28] See Point 2 of the Recommendation.
[29] See Annex to the Recommendation.
[30] See, in this respect, paragraph 20 of the SMP Guidelines.

Relevant legal tests and statutory duties

2.41 Where we propose that a market is not effectively competitive, we identify the undertaking(s) with SMP in that market and propose what we consider to be appropriate SMP obligations. When proposing a specific SMP obligation, we need to demonstrate that the obligation in question is based on the nature of the problem identified, proportionate and justified in light of the policy objectives as set out in Article 8 of the Framework Directive.[31]

2.42 Specifically, for each and every SMP obligation we are proposing, we explain why we consider it satisfies the test set out in section 47 of the Act, namely that the obligation is:

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

2.43 Additional legal requirements also need to be satisfied depending on the SMP obligation in question. For example, where we propose an obligation to provide third parties with network access, we must take into account factors including the feasibility of the network access, the technical and economic viability of creating networks[32] that would make the network access unnecessary, the investment of the network operator who is required to provide access[33], and the need to secure effective competition[34] in the long term.

Ofcom's statutory duties under sections 3, 4 and 4A of the Act, and under Article 3 of the BEREC Regulation

2.44 We also explain why, in our opinion, we consider the performance of our general duties under section 3 of the Act would be secured or furthered by our proposed regulatory intervention, and that it is in accordance with the six Community requirements under section 4 of the Act. This is also relevant to our assessment of the likely impact of implementing our proposals.

2.45 Consistent with our duties under section 4A of the Act and under Article 3(3) of the BEREC Regulation, we have also taken due account of the applicable EC recommendations and utmost account of the applicable opinions, common positions, recommendations, guidelines, advice and regulatory best practices adopted by BEREC relevant to the matters under consideration in this consultation document.

[31] See Article 8(4) of the Access Directive.
[32] Including the viability of other network access products, whether provided by the SMP operator or another person.
[33] Taking account of any public investment made.
[34] Including, where it appears to us to be appropriate, economically efficient infrastructure-based competition.

EU Civil Infrastructure Directive

2.46 We have also considered the implications for the BCMR of the EU Civil Infrastructure Directive (CID), which is due to come into effect in UK law by summer 2016.

2.47 In summary, the CID will introduce a requirement for all public communications networks operators and utility network operators to meet all reasonable requests[35] for access to their infrastructure from public communications networks operators (e.g. fixed and wireless broadband providers, including CPs such as BT, Colt, Virgin, EE, Telefónica O2 and Vodafone) made with a view to deploying high speed electronic communications networks.[36]

2.48 Unlike the SMP framework where any obligation to provide network access would be limited to any operator(s) found to have SMP and would be limited by the product and geographic scope of the market(s) in which it is applied, the CID allows reasonable requests for access on a nationwide basis to all public communications and utility network operators' infrastructure.

Impact assessment

2.49 The analysis presented in this document constitutes an impact assessment as defined in section 7 of the Act.

2.50 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 we have to carry out impact assessments where our 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 impact assessments in relation to the great majority of our policy decisions. For further information about our approach to impact assessments, see the guidelines, *Better policy-making: Ofcom's approach to impact assessment*, which are on our website: http://stakeholders.ofcom.org.uk/binaries/consultations/ia_guidelines/summary/condoc.pdf

Equality impact assessment

2.51 Annex 29 details our Equality Impact Assessment for this market review. 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.

2.52 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

[35] Under fair and reasonable terms and conditions, including price (Article 3(2)).
[36] Article 3(2).

affect all industry stakeholders equally and will 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.

Section 3

Market Context

Introduction

3.1 In this review, the main business connectivity products and services we focus upon are leased lines used by different end-users. We also consider whether alternative services offer an effective competitive constraint on leased lines services.[37]

3.2 This section provides an overview of the following areas:

- the main users of business connectivity services, including different users of leased lines and their purchasing behaviour;
- the main suppliers of services, including providers at different stages of the value chain;
- a description of the main products used to deliver different requirements;
- the main demand trends and developments; and
- the main developments on the supply-side, including investment in local network infrastructure and the expansion of CPs' core networks to include some large data centres as switch sites or 'core network nodes'.

Markets overview

Main users of business connectivity services products and services

3.3 There are three main end user segments that make use of leased lines (or alternatives): enterprise customers, mobile network operators (MNOs) and Local Loop Unbundling (LLU) operators. Below we explain the underlying requirements of these end user segments and how they go about purchasing their business connectivity services.

Enterprise segments

3.4 Many organisations, both in the private and public sectors, use leased lines to support a wide variety of ICT applications, such as:

- *Data connectivity:* this includes reliable email and internet access, remote access to the enterprise network, information/data exchange between enterprise sites, and off-site data back-up to data centres (storage area networks).
- *Voice and video conferencing applications:* leased lines circuits are used to support ISDN and VoIP services.

[37] As we discuss in Annex 10, we have already assessed the need for regulation of asymmetric broadband in a separate market review for Wholesale Broadband Access services. Therefore, the significance of asymmetric broadband, in this BCMR is the constraint that asymmetric broadband would place on leased lines.

- *Resilience*, where leased lines are used as backup lines or as links between an enterprise's computer server sites for disaster recovery.

- *Bespoke high value applications:* for example, some financial institutions require very low latency links to securities exchanges to support trading activities.

- *Legacy / niche applications:* critical national infrastructure operators such as large energy and water utilities require leased lines to support metering, telemetry and monitoring of their networks.

3.5 In general, based on our consumer survey,[38] we observe that larger enterprise customers are more likely to require leased lines and they often need to connect together a number of different sites.[39] These users need high quality connectivity to support the business critical applications listed above. Some SMEs also use leased lines, but asymmetric broadband is often preferred due to cost and differing underlying business requirements.[40]

3.6 While retail leased lines can be purchased as a stand-alone network service to individual sites (for example to enable connection to the internet), many end-user organisations may purchase all leased lines requirements for all sites as part of a single tender that includes a wider package of ICT services.[41] However, other larger end-user organisations might purchase leased lines directly from CPs and manage other ICT services in-house.[42]

3.7 In general, the majority of businesses tend to buy all of their services from a single supplier, although one quarter use more than one supplier. Our consumer survey suggests that most enterprise customers on average have contracts for around two to three years, although longer contracts are observed particularly with larger customers.[43] However, even with longer contracts, most customers appear to review their service requirements and purchases regularly. [44]

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[38] In the following paragraphs we refer to evidence from the consumer survey conducted by BDRC, http://stakeholders.ofcom.org.uk/binaries/consultations/bcmr-2015/annexes/BCMR_2014_report-bdrc.pdf

[39] Based on data underpinning Figure 5.10 of the BDRC consumer survey, the average number of sites connected was 4.20 with fewer sites (2.73) connected by small businesses (10-100 employees).

[40] Although some small businesses might use leased lines, leased lines represent a small proportion of these users requirements. For example, Figures 27 and 28 of our market research looking into SMEs show very limited take-up of leased lines. In the case of micro busineses with fewer than ten employees, less than ten percent had claimed to have a leased line or Ethernet service, See: http://stakeholders.ofcom.org.uk/binaries/research/telecoms-research/sme/sme_research_report.pdf.

[41] For example, a multi-site business may tender for a bundle of services, including management of computer systems, telephony and any underlying network connectivity requirements. In some cases, the business may not specify the particular type of leased line required and leave the decision over connectivity needs to the provider.

[42] We also understand that, in some rare cases, end-user organisations meet some of their demand for connectivity services by procuring access to a network operator's unlit optical fibres (dark-fibre) and use it to connect equipment in their sites.

[43] A third of respondents to the consumer survey estimated they were on 1-2 year (37%) or 2-5 year (33%) contracts with an existing supplier for a BCS, while a quarter (24%) had contracts of up to 1 year. Contracts tended to increase with length depending on customer size. Page 50 BDRC consumer survey.

[44] In general, enterprise customers review value-for-money or service quality at least every 2-3 years and nearly three in five go to formal tender within the same period. Our market questionnaire revealed that SMEs tend to approach suppliers directly, whereas government and public sector

Leased lines as inputs to MNOs and LLUOs networks

3.8 Leased lines are also used by communications providers (CPs) such as mobile network operators and local loop unbundlers to build the networks they use to support the provision of communication services (i.e. mobile services and asymmetric broadband internet access). The capacity and price of the leased lines affects the speed and cost of downstream mobile and asymmetric broadband services. For example, our best current estimate is that mobile backhaul accounted for just under one fifth of MNOs' network costs in 2014/15.[45]

3.9 MNOs use large volumes of leased lines to carry mobile voice and data services between their radio base stations and their core networks. Similarly, most suppliers of asymmetric broadband services rely on leased lines to backhaul broadband traffic from BT's exchanges (where they have co-location equipment to aggregate unbundled local loops) to their core networks.

3.10 Unlike enterprise services that tend to be concentrated in urban areas, mobile backhaul requirements are geographically dispersed, reflecting the need for mobile operators to provide mobile base stations to cover a significant proportion of the UK. LLU backhaul demand also extends outside of the main urban areas, as the main operators such as TalkTalk and Sky have co-location equipment at a significant number (but not all) of BT's local exchanges around the country.

3.11 As large national operators, MNOs and LLUOs tend to be quite sophisticated buyers. MNOs have noted a general preference to purchase from a limited number of suppliers.[46] This is partly a function of the overhead of managing multiple supplier relationships and contracts. BT remains the main MNO backhaul supplier.

Suppliers of leased lines and alternative services

3.12 Leased lines markets are part of a complex value chain for business connectivity, ranging from network connections sold as a package with downstream services such as ICT solutions; to wholesale inputs assembled by network providers; and at the most upstream level access to physical network such as access to (unlit) fibre or access to telecoms ducts in the ground.

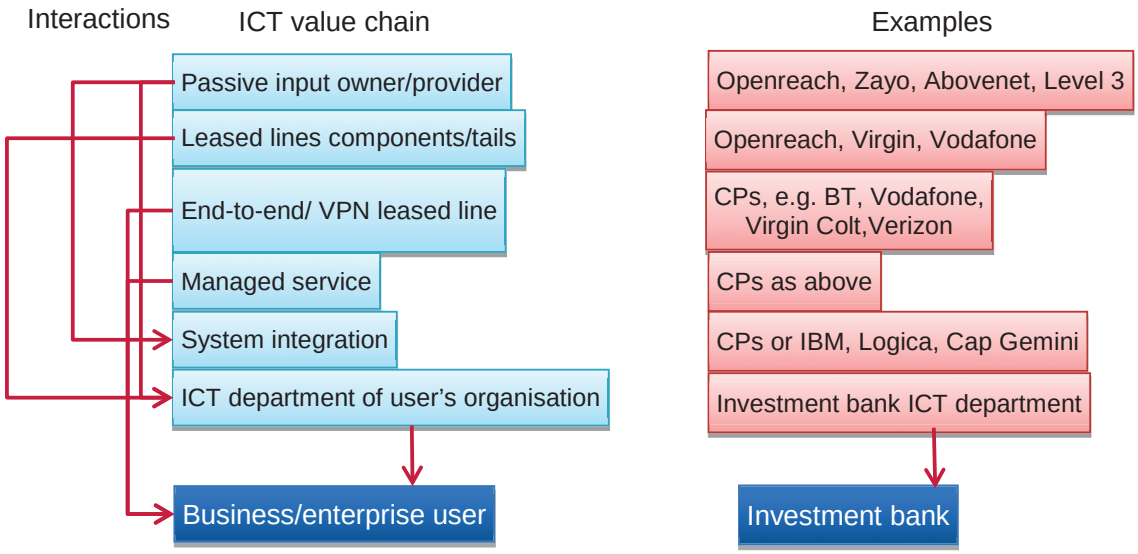
3.13 Figure 3.1 shows a simplified representation of the range of suppliers in the value chain and the interactions between them. We show the most upstream suppliers and services (physical network) at the top through to the most downstream (fully managed) services. We show the main players on the right hand side at each level of the value chain. We also show (some) of the interactions between different layers of the value chain on the far left hand side. For example, at a particular level in the value chain, a user may use the input shown immediately above. For example, an end-to-end or VPN leased line might use leased lines components or tails. In some cases, however, it may be that an entity may be able to self-supply several layers, so it may only require some upstream components.

organisations use competitive tender processes. Large enterprise customers have the most variation in how they buy services, but in general with higher value/more complex solutions are more likely to require tender or a request for proposal (RFP).

[45] This estimate is based on the Ofcom MCT model.

[46] Based on the market questionnaire responses.

Figure 3.1: The ICT value chain and examples



3.14 As discussed above, business and enterprise users may purchase leased lines embedded within managed ICT solutions, provided to enterprise customers by systems integrators such as BT Global Services, IBM, Logica CMG and many others, large and small. Systems integrators typically do not own and operate their own telecoms infrastructure. Instead, they purchase the connections needed to meet the end-users' requirements from communications providers (CPs) higher up the value chain.

3.15 CPs who provide managed services for business customers include BT, Virgin, Vodafone, Colt, Easynet and Exponential-E. The CPs, in turn, use either leased lines and/or contended business-grade broadband or superfast-broadband services to construct the connectivity solution required.

3.16 The main CPs that supply leased lines include BT, Virgin, Vodafone, Level 3, Colt, Verizon and Zayo, among others. CPs usually carry leased line services on either copper wires (typically for lower speed legacy applications) or optical fibres, although fixed microwave links are also sometimes used. The inherent transmission capacity of optical fibre is far greater than that of either copper wire or microwave links. Construction of physical networks of copper wires or optical fibres requires a high initial investment in civil infrastructure, including trenches, ducts, poles and cables.

3.17 All telecoms services provided in the UK rely on physical infrastructure such as fibre and duct in trenches in the ground. In some cases, operators such as Zayo or Level 3 may offer passive inputs such as dark-fibre or duct access. These services are passive rather than active services, as they do not include the necessary telecoms equipment at each end of the line or service management tools. Not all operators offer access to their passive infrastructure as they prefer to sell active services. Typically, where passive inputs are used, they are purchased by other operators to combine with their own infrastructure. There are however some examples where very sophisticated enterprise or business customers might buy dark-fibre and other equipment and self-provide underlying connectivity themselves.

3.18 As discussed further in part 5 of this section, BT's physical network is ubiquitous in the UK and BT can deliver leased lines almost everywhere in the country except in the Hull area, where KCOM is the main provider of physical network. BT's significant

network presence means that it can use this network to self-supply (nearly) all downstream retail services as well as selling services to others CPs that do not have the same level of network coverage.

3.19 Other CPs including, for example, Virgin, Vodafone and Level 3, own and operate sizeable physical networks in the UK, but the coverage of each of their networks is significantly less extensive than that of BT. Therefore, to provide national services, most CPs other than BT rely on some third-party supply of leased lines services.

Services considered in this review

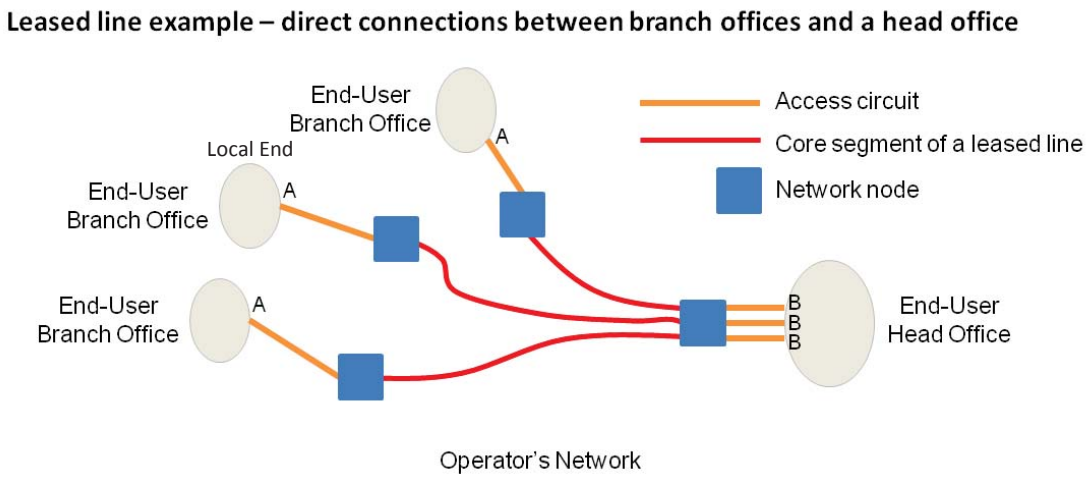
3.20 Our review considers retail and wholesale services that make use of leased lines as well as other services that might offer alternative ways of meeting some business needs. Our full assessment of the potential trade-offs between leased lines and alternative services is set out in sections 4 and 5. Below, we provide a high level description of leased lines and other services from a technical standpoint.

Retail services

Retail leased lines services

3.21 Retail leased lines are fixed connections that provide end-user organisations with dedicated symmetric capacity between sites. They can be used for a variety of applications, including voice, video and data communications.

Figure 3.2: Retail leased line



3.22 Figure 3.2 above shows a simplified configuration. The business sites at each end of the circuit are linked to the nearest nodes in the CP's network (typically on BT's network this is a Local Serving Exchange (LSE)) using an access network. The access network links are commonly known as 'local ends'. Connectivity between the LSEs may be provided by a direct fibre or copper connection or, more commonly for longer distance connections, using the CP's backhaul and core transmission network.

Different interface types for leased lines

3.23 In this review, we consider leased lines that employ technologies in common use in the UK. We classify those technologies into three main groups:

- **Traditional Interface (TI) leased lines**: This group includes services which use legacy analogue and digital interfaces. In the past these have been the most common types of leased line in use in the UK, but their volume is now in sustained decline. In this category there are two broad types of circuit:

  - Analogue interface leased lines: These are commonly used for voice transmission, e.g. external extension circuits between business sites. They are also used for low-bandwidth data transmission.

  - Digital interface leased lines based on legacy TDM technical transmission standards, including Plesiochronous Digital Hierarchy (PDH) and Synchronous Digital Hierarchy (SDH), and which use the ITU G.703 interface. They have stable and predictable transmission characteristics, low transmission delay (latency) and low jitter (variation in transmission delay). These characteristics are important in some user applications. PDH and SDH circuits are currently the most common type of traditional interface leased line, and are used for enterprise voice and data services. They are available in bandwidths ranging from 64kbit/s up to 10Gbit/s. The most popular variants are n x 64kbit/s and 2Mbit/s.

- **Alternative Interface (AI) leased lines**: This group of digital leased lines services uses modern interfaces that are generally more suitable for transmission of Internet protocol (IP) data and are often more cost-effective in delivering high bandwidth services than legacy technologies. Interfaces used in AI leased lines include:

  - Ethernet, which is the most common AI leased lines technology. It was originally developed for office environments, where it is still used to transmit data between computers in local area networks (LANs). In recent years it has been developed for use in telecommunications networks. Ethernet services are currently available in a range of bandwidths from 10Mbit/s to 100Gbit/s, with the most common being 100Mbit/s.

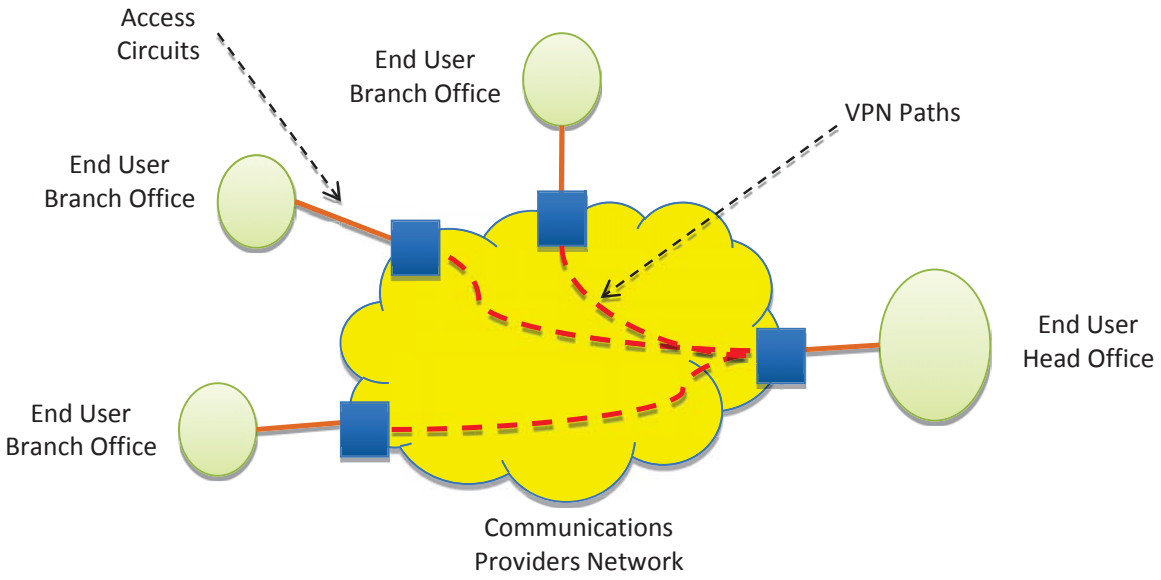
  - Fibre Channel (and related FICON and ESCON interfaces), which is a high-bandwidth technology primarily used for data storage network applications. Originally developed for use with super-computers, it has now become the standard connection type for enterprise storage area networks.

- **Wavelength-division multiplexing (WDM) leased lines:** WDM is a transmission technology originally used by network operators to provide optical fibre links with very high capacity within their networks. It is now increasingly being used by businesses that have very high bandwidth requirements, particularly for data centre and data storage network applications, and in the media and broadcast industries. The distinguishing feature of WDM is its scalability. Each WDM system can support multiple circuits over one or two optical fibres (typically 16 or 32 circuits at capacities above 1Gbit/s). Additional circuits can be quickly added without disruption to the existing circuits and without adding additional fibres. WDM is most commonly used within networks for backhaul and core segments. However, some very large end-users might value the ability to add bandwidth quickly and at low cost. WDM needs to be provided with a relevant transport protocol, and typically these are AI interfaces such as Ethernet or Fibre Channel, but it also supports the TI SDH interfaces.

Virtual private networks

3.24 Organisations often use leased lines to build private networks, linking their sites together so that offices can exchange data and access corporate applications. Virtual private networks (VPNs) provide an alternative to a private network of retail leased lines to achieve this functionality, using a public core network provided by a CP. [47] The organisation's data is transmitted typically using virtual paths across a core infrastructure shared with other services. Specific protocols are used to ensure the privacy of each user organisation's transmissions through the shared infrastructure. Figure 3.3 below illustrates a simple example connecting several branch offices to a head office.

Figure 3.3: Virtual Private Network (VPN)



3.25 Each site needs an access circuit to connect it to the VPN. This may be provided with a leased line, but other types of connection such as xDSL broadband are also used depending on the user's requirements.

Asymmetric broadband services

3.26 Asymmetric broadband services are used by some business customers for connections to the internet or to connect together branch offices over VPNs. Such services are asymmetric because the headline upload speed is often much slower than the download speed. The main asymmetric broadband technologies deployed in the UK are:

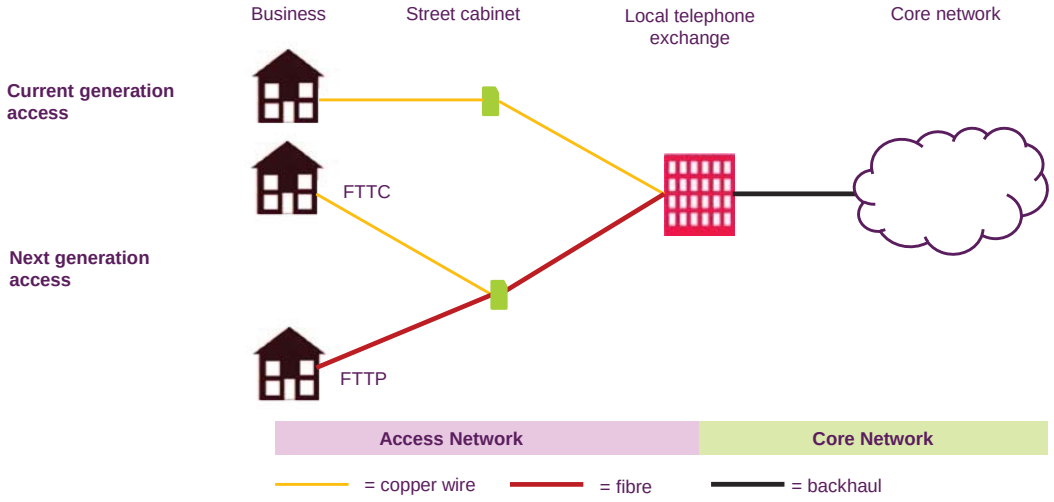
- Asymmetric Digital Subscriber Line (ADSL);

[47] According to the BDRC consumer survey, a number of businesses have a VPN (42%), largely underpinned by ADSL or Cable modem, or fibre broadband connection (39%), with one fifth (22%) underpinned by leased lines. Use of VPNs correlates with business size, ranging from 40% among small businesses to 67% among large ones. Two-fifths (37%) of business users asked said they have any type of leased line.

- fibre to the cabinet or premises (referred to collectively as FTTx or next generation access (NGA)); and
- cable modem.

3.27 The architecture used to provide asymmetric broadband services is shown below in Figure 3.4.

Figure 3.4: Asymmetric broadband architecture[48]



3.28 Current Generation Access (CGA) uses ADSL or ADSL2+ technology over the copper access network from the local exchange to the end-user premises. ADSL technology allows the use of a standard copper telephone line to provide high bandwidth asymmetric data communications. The bandwidths available to end-users are dependent both on the equipment at the local exchange (e.g. the type of ADSL technology deployed) and on the distance of the customer from the local exchange.[49]

3.29 NGA technologies rely on an upgrade to the access connection in one of two ways:

- Fibre To The Cabinet (FTTC) - the connection to the cabinet is replaced by fibre and active equipment is deployed in the cabinet. The current copper access network connection from the cabinet to the end-user remains in place; and
- Fibre To The Premise (FTTP) - fibre is used all the way from the exchange to the end-user.

3.30 FTTC deployments currently use VDSL2 technology over a copper connection that remains between the cabinet and the end-user with fibre then running from the street cabinet back to the exchange. FTTP services are entirely fibre-based access services and can be provided using a range of different technologies. Where BT has deployed FTTP, it uses a Gigabit Passive Optical Network (GPON) which shares a single fibre from the exchange between a number of end-user premises.

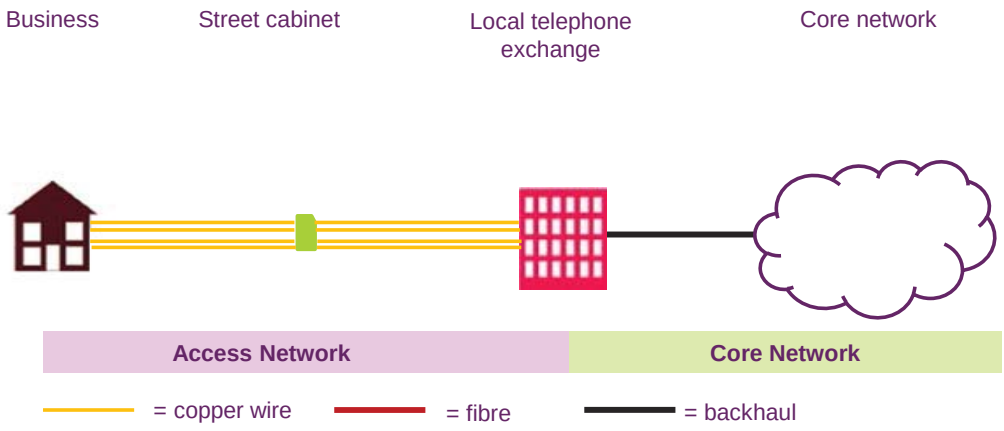
[48] With CGA no active equipment is deployed to the street cabinet.
[49] Available bandwidths can also be increased by using bonded ADSL, in which multiple ADSL lines are bonded together to serve as a single connection with multiplied speeds.

3.31 Virgins' network provides NGA in a different architecture than discussed above for CGA services. Connection between the end-user and the network is not provided over copper, and DSL technology is not used in the access network. Instead, the end-user connects via a hybrid coaxial/fibre network utilising Data Over Cable Service Interface Specification (DOCSIS) technology to the head-end equipment in Virgin's serving exchange. The use of DOCSIS technology means that the cable network is not subject to the same bandwidth limitations that are evident with DSL technology.[50]

Ethernet First Mile (EFM)

3.32 EFM is a set of specifications that allow CPs to run Ethernet over multiple bonded copper pairs in the access segment to connect the "first mile" from the customer to the nearest node. In the UK, CPs most commonly lease BT's copper local loops to connect customer premises to the nearest local serving exchange.[51] From exchange locations connectivity can then be provided in a similar manner to leased lines, using the CPs' backhaul and core transmission networks. Figure 3.5 summarises the architecture of EFM provision.

Figure 3.5: EFM architecture



3.33 The copper-pair is dedicated to the EFM service and is able to provide dedicated symmetric connectivity to the customer with an Ethernet interface. In this respect, the service is identical to an Ethernet leased line. The key difference between EFM and other leased lines is the use of copper unbundled loops in the access segment for the former. This has some impacts on the services offered.

3.34 However, the use of copper in the access segment means that the EFM connection faces distance limitations similar to those of CGA broadband such as ADSL. The signal diminishes the further the distance of the customer from the exchange, which in turn impacts on the speed of a connection that can reliably be offered. As with ADSL, one solution to increase bandwidth is to bond together a number of copper lines to serve a single site.

[50] We define superfast-broadband as services in excess of 30Mbit/s, which is mainly achieved on NGA technologies.
[51] For this purpose, CPs use unbundled local loops which BT is obliged to provide on regulated terms as a remedy for its SMP in the Wholesale Local Access Market.

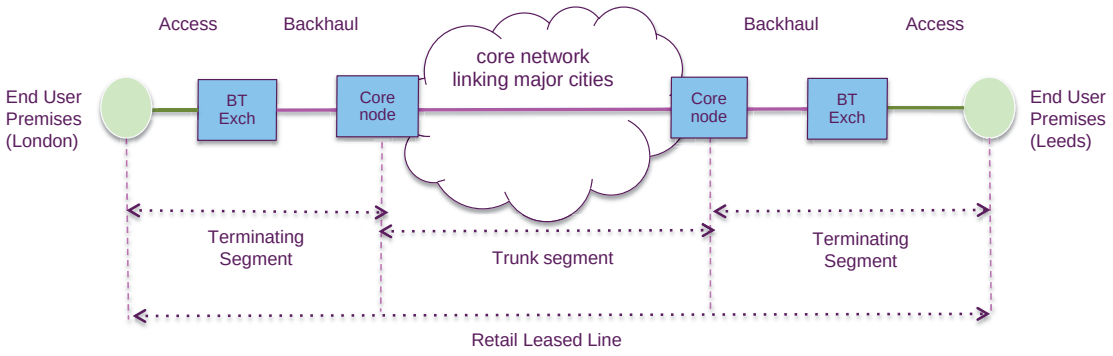
Wholesale services

3.35 CPs provide wholesale leased lines services to each other, either on a commercial basis or on a regulated basis. A CP purchasing wholesale leased lines uses them either as components to construct retail leased lines services for end-user organisations, including as access tails for VPNs (shown in Figure 3.3), or to build its own network, for example to connect its network nodes together.

Wholesale leased lines network segments

3.36 For regulatory purposes, we often distinguish between different parts of the network as shown in Figure 3.6.

Figure 3.6: Wholesale leased lines by network segments



3.37 There are three broad types of wholesale leased lines service:

- **end-to-end services:** these link two end-user sites, typically over relatively short distances. These are often local connections either directly connected or within similar exchange areas;

- **terminating segments:** most commonly link an end-user's site to the purchasing CP's network node, enabling the purchasing CP to assemble an end-to-end service using a combination of wholesale inputs and its own network. Terminating segments can also be used to link together nodes in the purchasing CP's network. Terminating segments consist of access and any (necessary) backhaul segments:

  - *Access segments:* these are typically the final network leg running from an end-user's premise (at the network termination equipment) to a local access node (typically on BT's network this might be in a local serving exchange ("LSE")) [52] or an equivalent point on a rival network where network equipment is located.

  - *Backhaul segments:* these are circuits running from a local access node back to the purchasing CPs own core network (or between exchanges). Backhaul segments often make greater use of shared infrastructure, including physical

[52] We note that a backhaul network could in theory start from a point closer to the end-user, for example where a CP has installed equipment in a street cabinet. However, in most circumstances a local serving exchange is the first point at which different traffic streams from individual end-users come together.

sharing (i.e. the same duct and fibre) and/or traffic combined using multiplexing techniques.

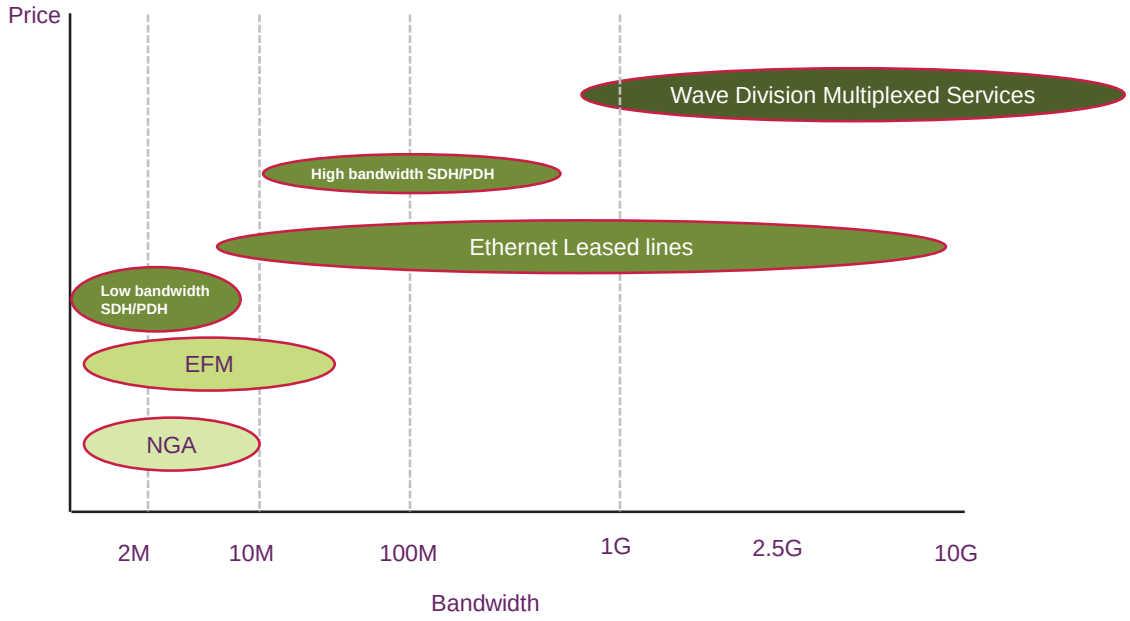
- **trunk or core segments:** these are segments of leased lines carried over aggregated links between major network nodes. As with backhaul, different traffic streams will share these core networks, but with potentially far more traffic, because they link major network nodes e.g. between major urban centres.

3.38 In the previous BCMRs we used the term 'Symmetric Broadband Origination' to describe terminating segments. As the acronyms associated with this term are well established, in this document we have continued to use them to refer to terminating segments. We distinguish between different SBO services according to the interface used (e.g. TISBO for traditional interface services using legacy technologies and CISBO for contemporary interface services using newer technologies such as Ethernet and WDM).

Different products and services suited to different applications

3.39 As discussed in this sub-section, there are a diverse range of business connectivity requirements. We further noted that there are a range of services that can be used to meet those needs either sold as point-to-point links (such as Ethernet, SDH and PDH leased lines) or as inputs to VPNs. Figure 3.7 below provides a simplified and stylised depiction of the different services in terms of the price relativities and the range of 'symmetric' speeds they typically support.

Figure 3.7: Stylised summary of main service types by bandwidth, price and quality



3.40 In general, even the cheapest leased lines (SDH/PDH and Ethernet) are charged at a significant premium to asymmetric broadband services such as NGA. Ethernet leased lines, which are now account for the majority of installed leased lines (see sub-section 4) are typically the cheapest form of leased lines connection starting at 10Mbit/s and above. The cheapest Ethernet services are based on EFM technology. SDH/PDH remains a 'competitive' leased line technology at lower bandwidths

(2Mbit/s), but is significantly more expensive than Ethernet leased lines at higher bandwidths.

3.41 Many users might select a service based on the bandwidth/price trade-offs. However there are a number of other 'quality' dimensions to each service that typically improve as price increases. We discuss these trade-offs in more detail in our market assessment Sections 4 and 5.

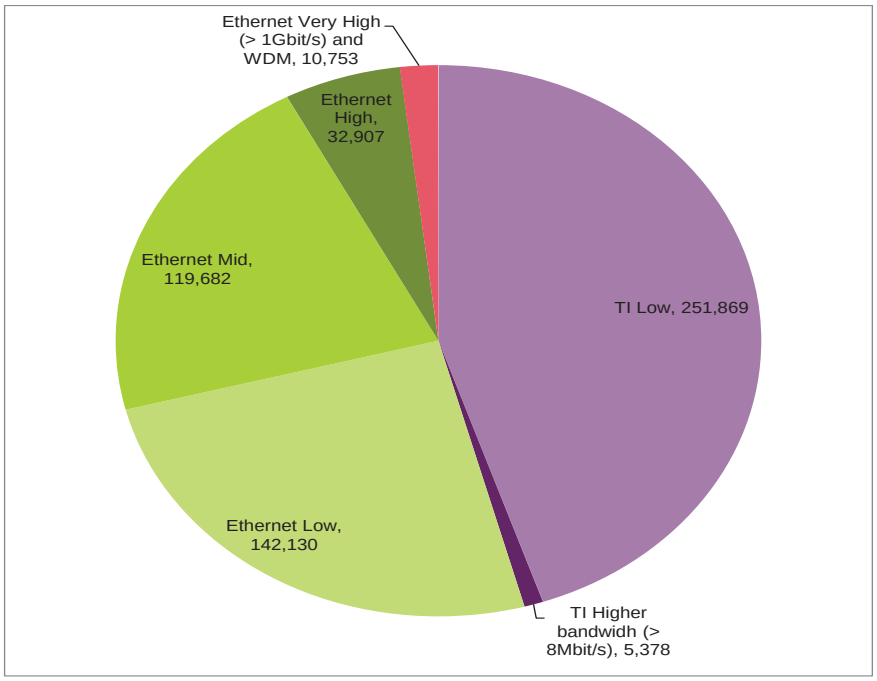
Volumes and trends

Overview of value and volumes of leased lines

3.42 The UK market for leased line services is worth approximately £2bn per annum at the wholesale level. BT's wholesale SDH/PDH revenues were approximately £0.45bn in 2014, and declined by 24% from the previous year; its revenues for wholesale Ethernet services operating at bandwidths up to and including 1Gbit/s were approximately £0.8bn in 2014, and changed little from 2013; its regulated wholesale revenues for services capable of support speeds above 1Gbit/s (Ethernet and WDM) were £67m in 2014, roughly double the corresponding amount in 2013.

3.43 Figure 3.8 shows a breakdown of the volumes of leased lines by main service types and bandwidths in 2013.

Figure 3.8 : Volumes of leased lines by different interface and bandwidth segments[53]



Source: Ofcom based on aggregation of operator data.

3.44 Figure 3.8 shows that Ethernet services operating at bandwidths up to and including 1Gbit/s now account for the majority of installed circuits in the UK. Nevertheless, volumes of TI services which use either legacy digital time-division multiplex or

[53] Ethernet low includes volumes of EFM circuits.

analogue interfaces remain significant. Volumes of Ethernet services operating at speeds above 1Gbit/s and WDM services capable of supporting speeds at or above 1Gbit/s are more limited, but as stated in paragraph 3.42 are significant in value terms.

3.45 In terms of the underlying trends in the market, Figure 3.9 shows volumes for BT's sales of TI circuits (and forecasts over the period covered by this review). The expectation is continued decline in TI services.

Figure 3.9: Declines in legacy TI markets

[✂]

Source: LLCC data from BT

3.46 Figure 3.9 shows that there has been a trend decline in TI services, but that significant continuing demand for TI circuits is expected to remain at lower bandwidths. According to BT's estimates, used here for purposes of illustration, there were still over 200,000 circuits (at sub-2 and 2Mbit/s) in 2012/13. BT forecasts show that it expects a further sharp decline in TI services over the period until 2018/19 with 2Mbit/s circuits providing the only significant remaining demand. This is consistent with BT's plans to shut the platform that supports sub-2Mbit/s circuits in 2020.[54]

3.47 By contrast, significant growth is forecast for Ethernet and WDM services with demand increasing in particular for Ethernet at 100Mbit/s and 1Gbit/s as end-users increase their speeds.

54 http://www.globalservices.bt.com/static/assets/pdf/campaign/tdm_services/TDM_Roadmap_Mar_2015_Iss6.pdf

Figure 3.10: Significant growth in Ethernet and WDM services

[✂]

Source: LLCC data from BT

3.48 An interesting potential development is the forecast decline in 10Mbit/s services. This is consistent with our discussions with operators that suggest 100Mbit/s and to some extent 1Gbit/s Ethernet leased lines are increasingly viewed as entry level speeds for leased lines users.[55] The decline in 10Mbit/s and similar predicted increase in 100Mbit/s volumes is also consistent with BT's pricing, where 100Mbit/s Ethernet services are priced nearly identically to 10Mbit/s. Another development is the emergence of EFM services as an alternative for users that do not necessarily need very fast upload and download speeds, whilst NGA may be an alternative for users who also do not need other features of leased lines.

Competition developments

3.49 We set out below some of the main developments on the supply-side, in particular the position of BT and rival infrastructure providers in the UK, and KCOM in the Hull area. Finally, we set out developments such as the emergence of data centres.

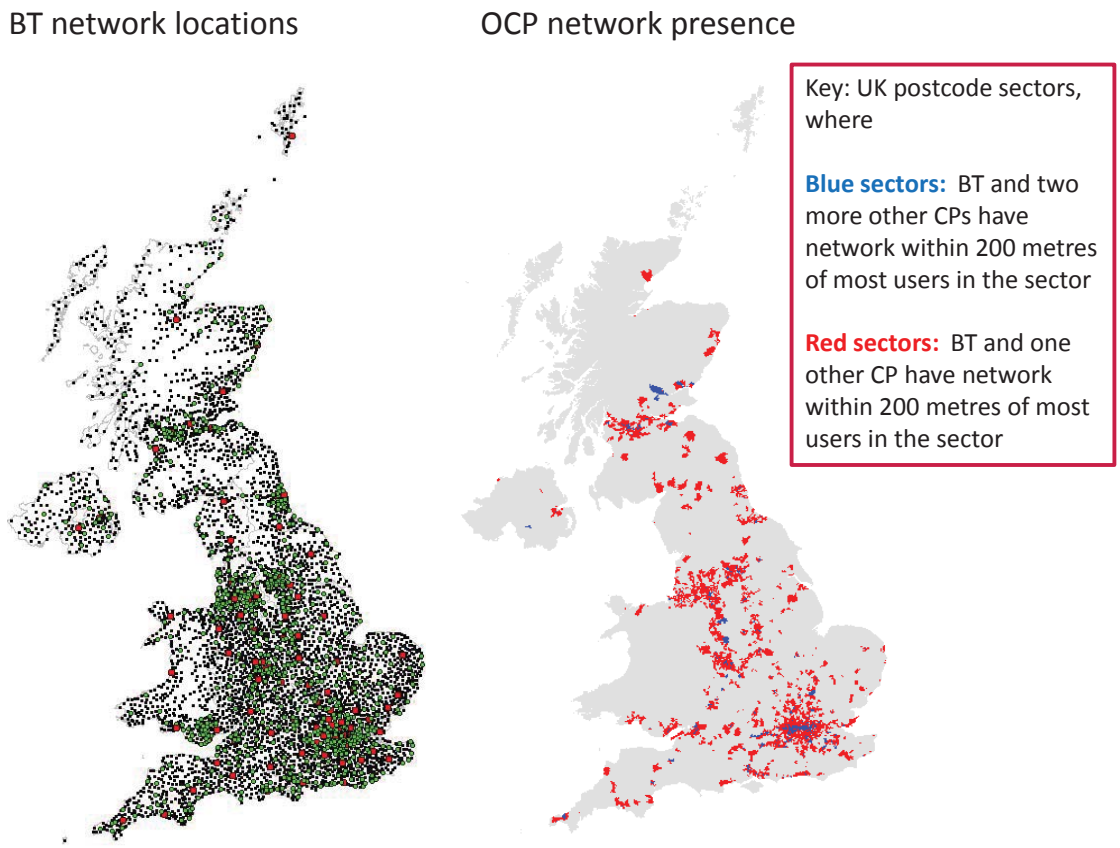
BT's market position versus competitors

3.50 Competition in business connectivity markets is set against a backdrop where BT has significant advantages over other operators arising from its possession of the largest and only ubiquitous UK network. Figure 3.11 shows BT extensive network of 5,600 local exchanges (black dots) and the 1,100 higher tier Access Serving Nodes (green

[55] For example, in our meetings with stakeholders on pricing and commercial strategies.

dots) and 107 Openreach Handover Points (red dots). BT has an extensive duct and fibre network from these main network node locations.

Figure 3.11: BT network locations and rival infrastructure across the UK



Source: Ofcom based on BT exchange and operator network locations.

3.51 Figure 3.11 shows BT's highly interconnected network of nodes across the UK (with the links between these locations covering core and backhaul network segments). One of BT's main advantages in the provision of access segments is that BT has existing connections from local exchanges to virtually all business premises.

3.52 BT's rivals have built physical networks to gain coverage of the main business concentrations and sites. Out of BT's rivals, Virgin owns and operates the largest physical network, with its network connecting at least one large business in [✂] of UK postcode sectors.[56] Virgin has recently announced plans to invest a further £3bn in network expansion.[57] It estimates this investment should increase the number of households and businesses to which it can offer services by one third over the next five years.

3.53 Other providers of wholesale leased lines include Vodafone (following its acquisition of Cable & Wireless), Colt, Level 3, Zayo, Verizon and several smaller companies. Of these smaller companies, CityFibre has plans to deploy fibre-based networks in a

[56] Based on Ofcom analysis.
[57] http://about.virginmedia.com/press-release/9467/virgin-media-and-liberty-global-announce-largest-investment-in-uks-internet-infrastructure-for-more-than-a-decade

number of second-tier UK towns and cities.[58] It has already built fibre-networks under separate projects with communications providers and local councils, including one in partnership with Sky and TalkTalk in York.[59] Nevertheless, the other providers' physical networks have a more limited reach than Virgin's. These networks have typically been built in business districts with high densities of potential business users (most notably in central London but also in some other large cities) and on aggregated trunk routes between major population centres.

3.54 The fact that BT has existing connections to most buildings can be a barrier to entry. This is because it means that the (forward-looking) incremental costs that BT will need to incur to provide services to a new customer site will generally be lower than those of OCPs.[60] For example, we estimate that Virgin's network passes within 200 metres of [✂ ✂] of large UK businesses and Vodafone's passes around [✂ ✂]. However, a lot of this network and business demand is in London. Even where CPs have infrastructure that passes in relatively close proximity to business users, they have far more limited infrastructure than BT and physical connections only to a minority of business users. With dig costs of more than £100 per metre possible in urban areas,[61] even a relatively short 100 metre dig to a site would cost £10,000. Where BT has an existing connection to that premise, the large (sunk) costs of fibre digs, suggests barriers to competition even over relatively short distances.

3.55 Retail customers typically require an end-to-end circuit (or circuits) between two or more of the retail customer's sites, which are where the "customer ends" of the circuits are located. To compete to provide a multi-site retail connectivity solution, a CP must have, or be able to obtain access to, infrastructure supporting leased lines to each site and any connecting segments in between.

3.56 As mentioned above, rival networks exist in some areas but there has been little recent build and little, apart from by Virgin, outside the centres of major cities. The majority of CPs have therefore remained reliant on BT's network to supply terminating segments in areas outside the reach of their own networks. If these terminating segments were not available, competition would likely be confined to circuits which a CP could provide entirely on its own network - a very small segment of the market.

3.57 Finally, as we discussed above, MNOs and LLUOs are significant purchasers of leased lines and their backhaul requirements are often located outside of the main urban areas in Figure 3.11, where some rival infrastructure exists.

KCOM's market position in the Hull area

3.58 In the Hull area, the incumbent operator, KCOM, has a ubiquitous network connecting to most sites in the Hull area, whereas the amount of other CPs'

[58] City Fibre estimates it currently has at least some fibre presence to 50 UK towns and cities: http://www.cityfibre.com/network and plans for further investment within these areas and across the UK: http://www.cityfibre.com/gigabit-cities/
[59] http://www.cityfibre.com/news/
[60] If BT already has a connection, the costs of installing this connection do not form part of BT's forward-looking costs of serving the customer, but such costs will form part of the forward-looking costs of a rival who does not already have such a connection. It is also important that the costs, once incurred, are sunk (not recoverable on exit). Note that BT would find it profitable to retain the customer as long as the price paid is greater than BT's own forward-looking costs.
[61] http://stakeholders.ofcom.org.uk/binaries/consultations/wla/annexes/csmg.pdf

infrastructure is very limited. Other CPs, frequently, have no connection to and/or network infrastructure near (potential) customers, and as such require network extension for connecting new customers. The high level and sunk nature of investment costs associated with network extension means that other CPs can frequently not justify the risk of sunk investments. Prospects for competition, and with that the incentives of other CPs to invest in network extension and customer acquisition, are further limited by the low demand and limited potential for future demand in the Hull area.

3.59 KCOM's incumbent position with an existing extensive network means that it can supply customers quickly and at low incremental cost. Moreover, the combination of costs of network extension being significant and sunk gives rise to significant barriers to entry and expansion. In light of the scale of demand in the Hull area, OCPs will be reluctant to make the investments required to compete for provision of services in this area. Nevertheless, there has been some entry on a small scale in the Hull area, such as MS3, which rolled out a fibre network.[62] BT has also established a point of presence in the Hull area from which it could use KCOM access links to supply customers.

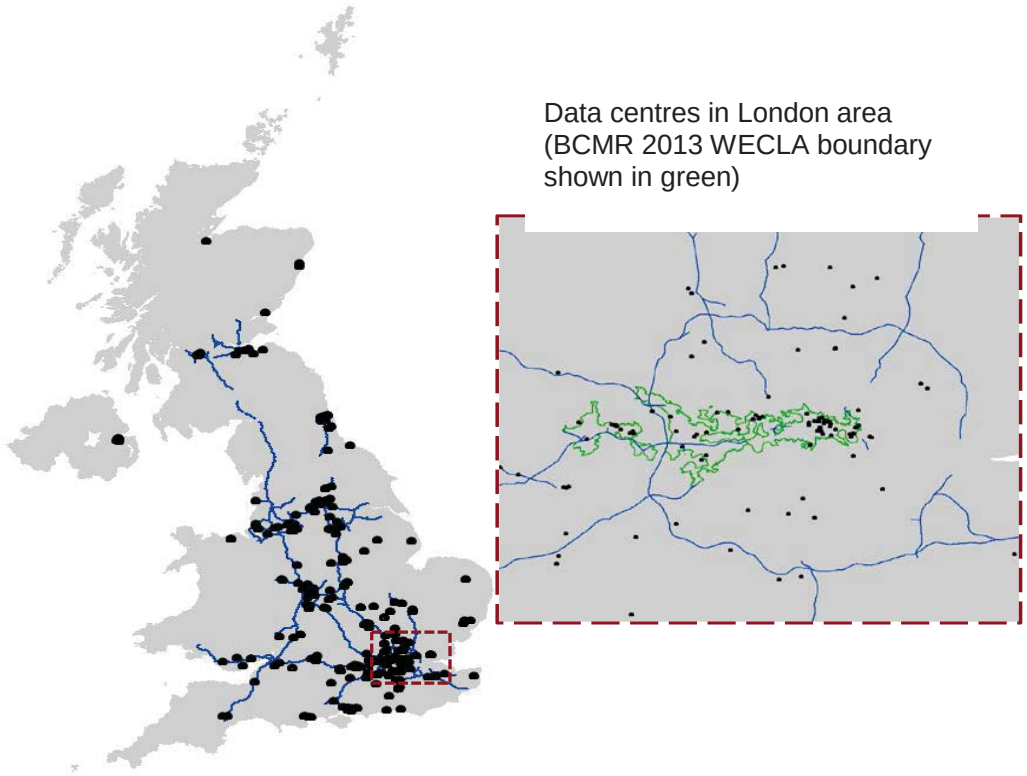
Data centre locations as network hubs

3.60 Data centres, in the broadest sense, are premises whose main purpose is to house computing and communications equipment in secure locations and which therefore require very high capacity links to carry data to and from their facilities. These sites tend to have multiple tenants and may be owned and operated by carriers and/or run by third-party providers that are "carrier-neutral".

3.61 Figure 3.12 shows data centre locations around the UK, including the significant concentration of data centres in the London area (the geographic area known as the WECLA in the 2013 BCMR statement is shown in green).

[62] http://www.ms-3.co.uk/pages/about-us.html

Figure 3.12: Data centre locations in UK



Source: Ofcom 2015

3.62 Data centres fulfil a number of functions as they are used for hosting locations to deliver retail services such as cloud computing and remote data storage/backup. Carriers also locate their own network switching equipment to link with their core networks and to other data centres.

3.63 With a number of retail services handed over or routed via these locations and operators locating their own networks at these sites, data centres have increasingly become network nodes or hubs for interconnection between networks. We have considered the implications of this in our assessment of core networks in Section 4 and in more detail in Annex 20.

Potential merger of BT and Everything Everywhere

3.64 We note BT's announcement that it has agreed to purchase Everything Everywhere from Deutsche Telekom and France Telecom.[63] This merger is likely to be assessed from a competition perspective by the Competition and Markets Authority (CMA), with Ofcom providing input to the CMA as required.[64] We consider that it is appropriate to take account of the potential merger in our assessment of relevant markets in the BCMR, as such assessment is conducted on a forward-looking basis.

[63] http://www.btplc.com/news/Articles/ShowArticle.cfm?ArticleID=845B68FF-E7CD-4FD9-B90B-6C4D0E3D1E3B
[64] https://www.gov.uk/cma-cases/bt-ee-merger-inquiry

3.65 On the whole, our provisional view is that the merger (taking into account the range of possible outcomes of its assessment by the CMA) is not likely to materially change the conclusions we propose to reach in this BCMR (either our assessment of the relevant markets, or the remedies we propose to impose). However, we have indicated at specific points throughout this document where we consider the merger to be particularly relevant to our analysis, and we will continue to keep this under review as we move towards a final decision.

Section 4

Market assessment for Wholesale Contemporary Interface Symmetric Broadband Origination services

Introduction

4.1 This Section sets out our product and geographic market definition proposals in relation to wholesale contemporary interface services using newer technologies such as Ethernet and WDM, or what we refer to as Contemporary Interface Symmetric Broadband Origination (CISBO) services. We also present our market power proposals in the relevant markets identified.

4.2 We propose to define the following markets, and make the subsequent SMP proposals:

4.2.1 Market for Contemporary Interface Symmetric Broadband Origination (CISBO) services in the Central London Area[65] (CLA), finding no CP to have SMP;

4.2.2 Market for Contemporary Interface Symmetric Broadband Origination (CISBO) services in the London Periphery (LP), finding BT to have SMP; and

4.2.3 Market for Contemporary Interface Symmetric Broadband Origination (CISBO) services in the Rest of UK (RoUK) excluding Hull, finding BT to have SMP.

4.3 The markets for CISBO services effectively replace the markets we defined as "alternative interface symmetric broadband origination" (AISBO) and "multiple interface symmetric broadband origination" (MISBO) in the 2013 BCMR. The CISBO market therefore includes AISBO and MISBO services at all bandwidths.[66]

4.4 This Section also considers the delineation between terminating segments and the core/trunk segments of CPs' infrastructure, and also whether it is appropriate to include two customer segments with somewhat distinct features (mobile and LLU backhaul) in the markets for TISBO and CISBO services, respectively. First and foremost, this Section presents our analysis and proposals concerning supply of terminating segments.

[65] We refer to paragraphs 4.88 to 4.99 later in this Section, and to paragraphs A15.155 and further in Annex 15 for a description of the approach followed to and the eventual delineation of these geographic markets themselves.

[66] Section 5 presents our assessment of competition in the wholesale market for "traditional interface symmetric broadband origination" (TISBO) services. We continue to consider that TISBO services are in a separate product market. As explained in Annex 10, the evidence suggests that users do not view low bandwidth TI and CI services as sufficiently close substitutes for these services to be part of the same product market. Section 6 presents our assessment of competition in wholesale and retail markets in Hull, where KCOM is the incumbent CP.

4.5 This Section is divided into the following sub-sections:

- In sub-section 4.1, we explain our approach to the assessment of competition.
- In sub-section 4.2, we provide our proposed product market definition.
- In sub-section 4.3, we provide our proposed geographic market definition. This sub-section is divided into four parts:
  - First, we identify geographic areas with distinct competitive conditions based on differences in presence of rival infrastructure.
  - Second, we explain and present our delineation of the geographic areas identified.
  - Third, we assess the degree and nature of competition in the areas identified, along geographic and product lines, and define markets
  - Finally, we present our assessment of competitive conditions in very high CISBO, which supports our Section 4.2 proposing of a single CISBO market.
- In sub-section 4.4, we set our our proposed assessment of market power in relation to each of the markets defined.
- In sub-section 4.5 we explain why we do not propose to identify separate markets in relation to mobile and LLU backhaul.
- In sub-section 4.6 we set out the markets we propose to define in relation to CI Core and our proposals on market power in relation to those markets.

4.6 This Section incorporates reasoning and evidence provided in the following Annexes:

- Annex 8 outlines our approach to product market definition;
- Annex 9 describes substitution between lower bandwidth CISBO services, and EFM and NGA, respectively;
- Annexes 11 and 12 analyse MNO and LLU backhaul;
- Annex 13 outlines the approach to assessing SMP we have followed;
- Annex 15 provides our service share and network reach analysis;
- Annex 18 analyses CPs' dig distances to connect customers;
- Annex 20 presents our analysis and views concerning definition of the (competitive) CI core, and how the boundary between core networks and local access and backhaul networks (terminating segments) is defined;
- Annex 21 discusses factors affecting competition at both a national and a local geographic level;
- Annex 22 sets out our analysis of BT's and KCOM's profitability of providing wholesale leased lines (including what we define in this review as CISBO services).

4.1 Infrastructure and our approach to assessing competition

4.7 We consider that the intensity of competition in a given area is likely to depend primarily on the number of competing networks in that area. For there to be sustainable competition in the provision of wholesale leased lines, there must be a sufficient number of CPs in an area each with its own local access infrastructure.

4.8 Once a CP has infrastructure in a given area, it will be able to supply services across the range of bandwidths and interface types in that area. The ability of CPs to compete using this infrastructure will be similar across the product range, and therefore in a given area we would expect competitive conditions across the product range to be broadly similar. In practice, CP shares of supply may differ across services, because these will also reflect the prevailing prices and margins associated with different products, or the niche being targeted by a particular CP, and perhaps also the effects of existing regulation. But such differences are unlikely to indicate any inherent and sustainable difference in the ability of CPs to compete across the various services. We would expect the ability of CPs to compete across the product range provided using the same infrastructure to reassert itself over time as prices change and users move between products, and particularly in the absence of regulation.

4.9 In other words, the intensity of competition varies primarily by geography (depending on the number of competing networks in an area) rather than by service within a given geographic area. Accordingly, while we also take into account other sources of evidence, we have collected and analysed a large amount of detailed evidence on the location and extent of competing networks in order to be able to rely on it in our market definition and SMP assessment.[67]

4.10 We define separate geographic markets only where there are clear, sustainable differences in competitive conditions. We consider a range of indicators of competitive conditions, focusing in particular on the number and density of competing networks. It would be neither practicable nor proportionate to attempt to deal with all geographic variations in competitive conditions by defining distinct geographic markets. However, we stress that, having defined the relevant markets, we do not then ignore variations in competitive conditions within any of those markets – variations in competitive conditions are also relevant to, and are taken into account, in the assessment of appropriate remedies, the third step of our review.[68]

4.2 Product market definition

4.2.1 Introduction

4.11 In the 2013 BCMR Statement, we identified a single market for low bandwidth AISBO services covering Ethernet services offered at 10Mbit/s, 100Mbit/s and 1Gbit/s and a separate market for MISBO services capable of supporting speeds above 1Gbit/s (including Ethernet at more than 1Gbit/s, and WDM services at any bandwidth). We considered that legacy TISBO services and asymmetric broadband (NGA) should be

[67] We refer to Annex 15 for a detailed explanation of the network reach analysis we carried out to identify and analyse geographic variations in rival infrastructure, and to Annex 18 for our analysis and considerations concerning the distances OCPs may be willing to extend their networks when providing leased lines to new customer sites.

[68] See, in this respect, the EC's Explanatory Note, Section 2.4, and the ERG Common Position, Section 5.

excluded from the market for low bandwidth AISBO services, while Ethernet First Mile (EFM) should be included in that market.

4.12 Table 4.1 summarises how the use of terminology in this review corresponds to that in the 2013 BCMR.

Table 4.1 Use of terminology – comparison

	Terminology BCMR 2016		Services / bandwidths	BCMR 2013 equivalent
CISBO (of all bandwidths, including both Ethernet and WDM)	CISBO up to and including 1Gbit/s	Low CISBO	Ethernet up to incl 10Mbits	AISBO
		Medium CISBO	Ethernet above 10Mbit/s up to incl 100Mbit/s	
		High CISBO	Ethernet above 100Mbit/s up to incl 1Gbit/s	
	Very high CISBO		Any service capable of supporting speeds above 1Gbit/s (i.e. Ethernet above 1Gbit/s and WDM services at all bandwidths)	MISBO

Source: Ofcom 2015.

4.13 Our approach to product market definition is set out in in Annex 8. In summary we first consider substitution at the retail level to inform our wholesale market definition (since demand for wholesale services is derived from downstream demand).[69] The product market definition is conducted in the absence of any other wholesale SMP regulation in leased lines markets[70] and on a forward looking basis.[71]

4.14 In this sub-section,

4.14.1 we first explain – in 4.2.2 – that we include EFM but exclude asymmetric (business) broadband (NGA) services from the CISBO product market;

4.14.2 then we set out – in 4.2.3 – our analysis of why we think that a chain of substitution links CISBO services of differing bandwidths into a single product market.

[69] Where we find that retail services are in separate product markets, we consider that any competitive constraint at the wholesale level based on derived demand/indirect constraints would be similarly weak and would not provide a basis for identifying a combined wholesale product market.
[70] Market definition (and the assessment of market power) is conducted in the absence of any other wholesale SMP regulation in leased lines market. This approach is referred to as the modified Greenfield approach. However, we take into account any *ex-ante* wholesale regulation upstream that exists independently of a finding of SMP in the business connectivity markets market (e.g. LLU).
[71] Rather than just looking at the current position, our market review looks ahead to how competitive conditions may change in future. Therefore, our market definition needs to be sufficiently forward-looking to cover the three year timeframe of the market review.

a) First, we show that a chain of substitution links lower bandwidth CISBO services (i.e. Ethernet services of up to 1Gbit/s, which are equivalent to AISBO services identified in 2013 BCMR).

b) Second, we show – based on evidence on substitution and an initial consideration of competitive conditions – why we consider that very high CISBO is part of a wider market including CISBO services of all bandwidths.

4.14.3 we explain our view – in 4.2.6 – about the position of dark fibre in relation to CISBO services, very high CISBO services in particular

4.14.4 finally – in 4.2.7 – we present our product market proposals summarising our considerations as regards the above issues, with our main proposal being that there is one product market for CISBO services.

4.2.2 Asymmetric broadband and EFM

4.15 In the 2013 BCMR, we concluded that EFM was in, and asymmetric broadband out of, the market for AISBO services (Ethernet services of bandwidths up to 1Gbit/s).

4.16 In Annex 9, we have analysed whether asymmetric broadband and EFM are in the same product market as CISBO services (we focused on Low CISBO services). We have summarised our proposals below.

4.2.2.1 Asymmetric broadband

4.17 In the CFI, we noted the 2013 BCMR Statement finding that asymmetric broadband was outside the AISBO and TISBO markets. We noted that there had been changes in the market since the last review that suggested we look again at asymmetric broadband. In particular the availability and take up of broadband services based on next-generation access (NGA) technologies such as fibre-to-the-cabinet has increased significantly. These services offer significantly higher upload and download bandwidths than current generation (ADSL/ADSL2+) broadband.

4.18 Also, the revised EC Recommendation refers to a single “High Quality Access” market that may include terminating segments of leased lines and ‘business-grade’ broadband services (both current generation broadband and NGA based services).

4.19 On the basis of our analysis in Annex 9 we propose that asymmetric broadband services (including NGA) are out of the market for CISBO services for the following reasons:

- our assessment of the qualitative differences between broadband services and leased lines highlights that there remain a number of key differences in technological and service features;

- the growing availability of NGA has increased the speeds available with asymmetric broadband, but the available migration data suggests that there has not been an obvious change in leased lines growth overall and BT reports very few cases where customers ceased BT’s Ethernet or TI services due to NGA migration;

- evidence from the consumer survey suggests that a minority of users might consider switching to NGA as an alternative to a leased line, but does not

suggest that NGA and leased lines are close enough substitutes to be placed in a single market;

- evidence also suggests that most CPs do not market asymmetric broadband as a substitute for leased lines, because of the key differences indicated above. This evidence includes CPs' marketing of broadband to consumers on their websites, as well as the vast majority of CPs' responses to our questionnaire and CFI about substitutability between the two; and

- consideration of barriers to switching highlights that end-users with large legacy networks and/or those who use specialised applications in particular are likely to face higher switching costs moving to broadband in the short term.

4.20 Overall the evidence indicates that substitutability is insufficiently strong for asymmetric broadband to be included in the same market as CISBO services, and this will remain so over the course of the three year review period.

4.21 Nevertheless, this does not mean that there are no competitive interactions between asymmetric broadband and CISBO services. Accordingly, we take the competitive impact of asymmetric broadband on competition for low CISBO services into account in our market power assessment by considering asymmetric broadband as an external constraint.

4.2.2.2 Ethernet First Mile

4.22 As discussed in Section 3, EFM is a set of specifications that allow CPs to run Ethernet over multiple bonded copper pairs in the access segment to connect the "first mile" from the customer to the nearest node. In the UK, CPs most commonly lease BT's copper exchange lines to connect customer premises to the nearest local serving exchange.[72] From exchange locations, connectivity can then be provided in a similar manner to leased lines, using the CPs' backhaul and core transmission networks.[73]

4.23 We propose that wholesale services provided using EFM are in the same market as CISBO services for the following reasons:

- the qualitative assessment generally shows there are not significant qualitative differences between EFM and other Ethernet leased lines. The main differences between the two relate to distances of EFM from the exchange and the bandwidths and SLAs that can be supported. However, customers with requirements up to 30 - 40Mbit/s, where EFM is feasible, are likely to consider EFM as a substitute for an Ethernet service;

- evidence also suggests that CPs position EFM as a lower cost type of leased line service, suitable for those customers that do not require high bandwidths. This is evidenced by the way CPs market EFM to consumers on their websites,

[72] BT is required to provide unbundled local loops as a remedy for its SMP in the wholesale local access market.
[73] EFM is presented to the customer with an Ethernet interface and provides dedicated symmetric capacity to the end-user and in that respect it is identical to an Ethernet leased line. The key difference between EFM and leased lines is the use of copper unbundled loops in the access segment and resulting impacts on the services offered.

along with responses to our questionnaire that supported the information we have on marketing;

- consideration of barriers to switching highlights that end-users with Ethernet-ready infrastructure in place might not face significant barriers to switching;

- relative price comparisons are consistent with a chain of substitution including EFM-based services and Ethernet leased lines. We further note that reductions in the price of BT's Ethernet services at 100Mbit/s may have been in response to competition from EFM at the low end of the market. The view that 10Mbit/s is a 'largely redundant' speed for standard Ethernet, may in part reflect the emergence of EFM as an alternative; and

- there have been significant increases in EFM volumes since our 2013 Review. We do not hold enough data to determine whether this significant increase might be a migration from leased lines, SDSL or asymmetric broadband. However, when considered in light of broader evidence, the increase in EFM take-up may seem like a reasonable consequence of the identified incentives for consumers to migrate to EFM as a lower cost substitute for low CISBO services.

4.24 Our analysis suggests that EFM would be a good substitute for some leased lines customers, especially those currently on or considering migration to low bandwidth CISBO services.

4.2.3 Product market definition for CISBO services – preliminary considerations

4.25 In the 2013 BCMR we concluded that while there was a chain of substitution linking most parts of the Ethernet leased line product range, there was a clear "break" between 1Gbit/s Ethernet on the one hand and higher bandwidth Ethernet services and WDM based services on the other. In this sub-section we set out why we consider that there is no longer a clear break in the chain, which supports our proposal to define a single product market for CISBO services.

4.26 We first discuss our general approach to the analysis (as set out in more detail in Annex 8), and then set out our evidence as to why there is no longer a clear break in the chain of CISBO products.

4.2.3.1 Approach to analysis: chain of substitution

4.27 As discussed in Section 3, the majority of business connectivity demand relates to circuits delivered with Ethernet technology, over fibre or copper (the latter using EFM). The maximum available speed of the underlying Ethernet connection is related to the equipment installed at the customer premise. At higher bandwidths, end-users can choose between Ethernet or WDM services.

4.28 Consistent with the EC Recommendation[74], the starting point of our assessment of product market definition is formed by an analysis of demand- and supply-side substitution. The key question is whether there exists a *chain of substitution* linking

[74] Commission Recommendation of 9 October 2014 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.

CISBO services of differing bandwidths and interface types, and, if so, whether the competitive constraints arising from this chain are strong enough for the range of services to be part of a single market.[75]

4.29 Where a group of products are differentiated they may still be part of a single market even if not all of the products are close substitutes for each other, if they are linked by a chain of substitution. Products that are close to the ends of the "chain" such as 10Mbit/s and 1Gbit/s circuits may not be close substitutes for each other, but both may be seen as substitutable for a 100Mbit/s circuit. If they are sufficiently close substitutes for a 100Mbit/s circuit, then there may be a complete chain of substitution, meaning that all three are part of a single product market.

4.30 In this sub-section, we present the arguments and evidence, which, in our view, show that a chain of substitution links CISBO products of differing bandwidths and interface types.

4.31 A chain of substitution can possibly link Ethernet and WDM services offered at differing bandwidths and with differing interface types. The substitution concerned may reflect demand side constraints (users may switch between different products in the chain). Supply side interactions are also relevant (suppliers may switch between different products in the chain, may be similarly able to compete across the chain, or may use products in one part of the chain to compete with another).

4.32 On the demand side, the main difference between CISBO users is their bandwidth requirements.[76] In some situations customers may require 1Gbit/s or more, in others less than 10Mbit/s. While customers may have varied demands for bandwidth, these demands could in principle be satisfied by using a single high capacity line or multiple lower capacity lines, so in terms of satisfying customer requirements there is very close demand side substitutability across the range. In practice, customers' choice of products (or combinations thereof) will be affected by the relative prices of the products actually offered. A customer requiring 10Mbit/s of capacity might choose a 100Mbit/s circuit if it was no more expensive,[77] while a 1Gbit/s customer might in theory have the option of purchasing a system capable of supporting higher bandwidths or, alternatively, several 100Mbit/s circuits. Accordingly, customer choice of different leased line products will depend on their relative prices.

4.33 In our detailed assessment of potential bandwidth breaks (below) we examine whether there are clear "breaks" in the chain, looking at whether there are large discontinuities in the products offered, their functionalities, costs and prices.

4.2.3.2 Homogeneity of competitive conditions

4.34 On the supply side, as noted above the ability of a CP to offer a circuit or set of circuits is founded primarily on what infrastructure it has available and this does not vary by product or circuit type. Once in place, a network can be used to supply CISBO services of all bandwidths and interface types. This is because CISBO

[75] We consider that it is appropriate to define a distinct market for TISBO services, which are legacy services where demand conditions are quite different to those for CISBO services, as we explain in Section 5.

[76] As discussed in paragraphs 4.47 to 4.49, some customers may also have particular demands for using a WDM system rather than Ethernet.

[77] In practice BT does set virtually identical 10Mbit/s and 100Mbit/s prices, in part in an effort to differentiate its entry level Ethernet leased line offerent by associating it with a high 100Mbit/s bandwidth.

services themselves differ only in the equipment at the circuit ends, and where circuits use the same interface but offer different bandwidths the equipment is virtually identical.

4.35 Since BT sets higher mark-ups on higher bandwidth circuits, it is easier for OCPs to profitably undercut BT and win more sales here, and in practice OCPs do tend to win more business at the higher ends of the market.[78] However, based on the evidence we have seen, OCPs' ability to do this is likely to be, at least in part the result of BT's choice of pricing structure, rather than any inherent difference in their competitive position in respect of high bandwidth and low bandwidth lines. These supply side considerations tend to point to a broad market definition.

4.36 This discussion above also has implications for our interpretation of differences in BT's service shares for products at different bandwidths. Service shares do vary by bandwidth. Our view is that this is also partly a result of BT's pricing policy, which features prices which increase with bandwidth whilst the incremental costs of network extension – which forms the majority of costs of providing services – generally do not vary with the bandwidth of the circuit. This combination of prices which rise with bandwidth and costs which vary with bandwidth to a much lesser degree is encouraging greater entry by OCPs in higher bandwidth CISBO segments, with the result that, so far as we are able to observe, BT's share of the supply of higher bandwidth services tends to be relatively low. At lower bandwidths, despite the presence of rival infrastructure which is equally capable of providing services at all bandwidths, BT's lower margins are associated with higher BT shares and less entry by OCPs.

4.2.4 Chain of substitution for lower bandwidth CISBO services

4.37 Our product market definition has considered the case for a potential bandwidth break on the lower end of the CISBO range (up to and including 1Gbit/s). We consider whether CISBO services at different bandwidths (low, medium and high CISBO) are part of a chain of substitution. We also consider whether there are material differences in fundamental competitive conditions between them, including differences arising from the inclusion of EFM services in the market (which are provided over a different infrastructure).

4.38 We concluded above, on the basis of relative price comparisons, that EFM-based services and Ethernet leased lines at up to 100Mbit/s appeared to be linked. We now consider whether there is a break between Ethernet services at 100Mbit/s and 1Gbit/s Ethernet. As in the 2013 BCMR review, there are price differences between lower bandwidth CISBO services at 100Mbit/s and 1Gbit/s. To comply with the requirements of the charge control, BT has reduced its Ethernet charges initially targeting reductions at 100Mbit/s and subsequently at 1Gbit/s since the 2013 BCMR Statement. [79] We note that despite these changes, 1Gbit/s service is still

[78] Suppliers can use bandwidth as a means of setting different prices and different margins to different customers. BT tends to set higher prices for higher bandwidth circuits (the "bandwidth gradient"), but since the price increments are proportionately smaller than the bandwidth increments, the effect is that the price per unit of bandwidth declines sharply as more bandwidth is purchased. However, since the costs of the circuits do not vary materially by bandwidth (for Ethernet products) BT tends to generate higher margins on higher bandwidth circuits.

[79] For an overview, see: https://www.elibrary-openreach.co.uk/downloadfile/221?contentid=293&pagetitle=2015_Ethernet_price_reductions_and_opportunities_-_slide_deck

approximately 60% higher than the price of 100Mbit/s, though for nearly ten times the capacity. The prices for 10Mbit/s and 100Mbit/s services are virtually identical.

4.39 We know from our analysis of equipment costs that these differences in BT's charges are not driven by bandwidth-related cost differences. Current Ethernet technologies available from vendors[80] allow CPs to use near identical equipment to deliver services at 10Mbit/s, 100Mbit/s or 1Gbit/s. The difference in cost between 10Mbit/s and 100Mbit/s and 1Gbit/s is very small (insignificant) and relates to the optics used at 1Gbit/s. [81] Hence, any observed variations in price by bandwidth are more likely a function of the pricing strategies of CPs, taking account of regulatory constraints, the strength of competition and interactions between the demand for circuits of different bandwidths.

4.40 The evidence, particularly that on the similarity in the costs of provision, does not point to any clear breaks between services offered at differing bandwidths. Whilst we do not know what prices would be in a competitive market, we can say that differences between the prices of circuits of different bandwidths would be small if they were to (only) reflect differences in incremental costs.

4.41 Supply-side substitution between CISBO services is technically feasible, as provision of any service up to 1Gbit/s would be on the same underlying network and using virtually identical equipment with an insignificant difference in costs. With near identical costs of supplying any bandwidth, a CP supplying a particular bandwidth (say 1Gbit/s) could start providing services at lower bandwidths requiring only minimal equipment upgrades, and vice versa.

4.42 Overall, we consider that price and cost differences are consistent with low, medium and high CISBO being part of a single product market.

4.2.5 No separate market for very high CISBO

4.43 In the 2013 BCMR Statement, we identified a separate product market for MISBO services, defined as services capable of supporting speeds above 1Gbit/s, and we noted that CPs have a choice of equipment when delivering very high speed requirements that can support more than one interface type.

4.44 In the 2013 BCMR, we found that, at the time, there was a clear break in the product chain between 1Gbit/s Ethernet services on the one hand, and higher bandwidth Ethernet and WDM services of any bandwidth on the other hand. The primary evidence we relied on was the substantially higher costs of the equipment used to provide MISBO services (both Ethernet >1Gbit/s and WDM services) and also the large step change in the per circuit price when moving from 1Gbit/s to above 1Gbit/s Ethernet services. We considered that this significant price difference, which the available evidence suggested could be explained by equipment cost differences, made it unlikely that there would be material substitution between circuits of more than 1Gbit/s and lower bandwidth circuits. In other words, users would be unlikely to

[80] BT and [✂] s.135 requests on cost of equipment used in providing EAD products and optical services.

[81] Evidence shows that identical base equipment is used for 10, 100Mbit/s and 1Gbit/s. The only difference between on the one hand 10 and 100Mbit/s and 1Gbit/s is the small form factor pluggable (SFP) optics used. These are thumb-sized devices that plug into the base equipment and contain the optics and electronics to support the difference bandwidths. The difference in the costs of SFP at 100Mbit/s and 1Gbit/s is insignificant.

respond to a small price change given large cost-related differences in prices of different bandwidths.

4.45 In addition, in the 2013 BCMR we observed differences in competitive conditions between AISBO services at up to and including 1Gbit/s, on the one hand, and MISBO services on the other, particularly in the WECLA.[82] At the time, the clear break in the chain suggested that there were separate markets for AISBO (at up to and including 1Gbit/s) and for MISBO circuits, and we therefore considered it appropriate to reflect the differences in competitive conditions we observed in our market definitions.

4.46 Evidence gathered for this review on how OCPs are using various technologies to compete, points to greater interaction between Ethernet and WDM services offered at differing bandwidths, suggesting that the distinction has blurred and that there is no longer a clear "break" in the chain. There are also factors tending to lead to convergence of competitive conditions over time – an example being customer migration from lower to higher bandwidth circuits).[83] In these circumstances, it is more appropriate to define a single market including Ethernet and WDM services of differing bandwidths.

4.2.5.1 The differences in service features and quality between WDM services and Ethernet services are less significant than in 2013

4.47 The two main methods used to support very high CISBO services are:

- ***Single service Ethernet:*** CPs can install Ethernet equipment at the customer premise that can only deliver a given maximum speed. Leading equipment vendors such as ADVA and CISCO sell Ethernet boxes starting at 10Mbit/s up to Gbit/s speeds of 2.5, 10, 40 and 100.

- ***Wave Division Multiplexing (WDM)****:* CPs can deploy WDM equipment that enables multiple beams of light each of a different wavelength to be sent down a single optical fibre simultaneously. Each beam of light typically supports a service connection with a data rate up to 40Gbit/s with typically two beams being used to provide a 100Gbit/s service connection. WDM equipment typically supports a wide range of service connection interfaces and protocols including Ethernet, traditional interface (SDH) and other interfaces such as those associated with data storage applications, e.g. Fibre Channel. WDM equipment typically consists of a number of shelf units, equipment monitoring and control units, transponder plug-in-units providing the interfaces and processing for one or more service connections and filters to combine and separate the light beams between the transponders and optical fibres. In some WDM equipment optical switches are also included. The provision of additional service connections may

[82] See the BCMR 2013 Statement, paragraphs 3.288 – 3.289 and 3.310 at: http://stakeholders.ofcom.org.uk/binaries/consultations/business-connectivity/statement/Sections1-4.pdf

[83] BT's forecasts shown in Section 3 are consistent with customers upgrading bandwidths over the timeframe of the review, though some of the increased demand for higher bandwidth services could be explained by new supply rather than customers upgrading speed. However, consumer survey results from Analysys Mason presented at a BT Ethernet Strategy conference provide some evidence on expected rates of upgrade. The evidence suggests around 10% of respondents at >100Mbit/s to 1Gbit/s expected to upgrade their Ethernet speeds within 1 year and around 20% within 3 years. For respondents with 1Gbit/s, more than 10% expected to upgrade their connection within 1 year. https://www.openreach.co.uk/orpg/home/downloads/Ethernet_Strategy.pdf

require additional transponder, filter and shelf units to be added depending on the utilisation of the units already equipped.

4.48 Our technical assessment does not suggest there have been significant changes in the feature set of WDM and it continues to support a range of interfaces and offers the ability to increase capacity quickly. Nevertheless, in the context of demand-side substitution, we think that the functional differences between single service Ethernet and WDM services are not as important as we identified in the 2013 BCMR statement:

- *Use of WDM to access niche interfaces*: our circuit data does not allow us to determine exactly what proportion of users might prefer WDM for its ability to support specialist interface types (i.e. those requiring connections to storage area networks). However, and importantly, single service Ethernet allows circuit emulation of some of the main specialist interface types, for example those used for storage applications (i.e. Fibre Channel over Ethernet).[84]

- *Ability to scale bandwidth with WDM:* In the 2013 BCMR Statement, we noted that a key advantage of WDM was its scalability. As such users with initially low requirement (say, 1Gbit/s), but with rapidly expanding capacity needs might select WDM as the most competitive service available when considered over the period of increasing demand. We contrasted this with Ethernet, where, if existing capacity (say, 1Gbit/s) is fully utilised, new fibre circuits must be added to expand capacity which is costly and will have a potentially far longer lead time.[85] However for users who want limited capacity with limited increase over time, a high capacity Ethernet service (e.g. at 10Gbit/s) is likely to be a perfectly adequate substitute for a WDM service. For users who have an initially large capacity requirement (greater than 10Gbit/s) then WDM is likely to be the preferred choice as long as it is cheaper than purchasing multiple lower capacity links.

4.49 Therefore, apart from those users with very specialist needs, at very high bandwidths the choice between single service Ethernet and WDM services is not necessarily a technical one. Instead, it derives from the relative prices of Ethernet and WDM services above 1Gbit/s. We discuss the evidence on relative prices and costs below.

[84] This means that a CP could install a single Ethernet link at an enterprise's main site to support its local area network (for site to site data) and storage area network (for data back-up at a data centre). See for example: http://www.cisco.com/c/en/us/products/collateral/data-center-virtualization/storage-area-network-solutions/white_paper_c11-472771.html

[85] We observed that WDM services were used to support lower speed services at 1Gbit/s. However, our price analysis suggested that WDM services were sold at significant premium to low bandwidth AI services. We considered that if the customer had gone to the effort and cost of installing WDM capacity, this suggested that even if the end-user was initially using limited capacity, that user wanted a service which could be scaled very quickly. We considered that if the end-user was only ever likely to need capacity below 1Gbit/s with a specific interface, it would be more efficient to purchase a single service 1Gbit/s link rather than paying for more expensive WDM services.

4.2.5.2 Price and cost evidence no longer points to a clear "break" in the chain of substitution

4.50 In contrast to our finding in the 2013 BCMR, we no longer consider that the evidence on pricing and cost point to a clear break in the chain of substitution above 1Gbit/s Ethernet. In summary:

- BT's new 10Gbit/s EAD service appears to "fill" the gap in BT's product range;
- The differences in costs of WDM and higher bandwidth Ethernet services and those for 1Gbit/s Ethernet have reduced since 2013. Therefore, even if BT's prices suggest a "gap" this is not explained by equipment cost differences;
- OCPs are offering 10Gbit/s Ethernet and WDM products at lower prices than BT, filling in the "gap" in the chain that we identified in 2013; and
- OCPs appear to be successfully competing using WDM services across a range of bandwidths including in competition with 1Gbit/s Ethernet services.

BT's price differentials have narrowed

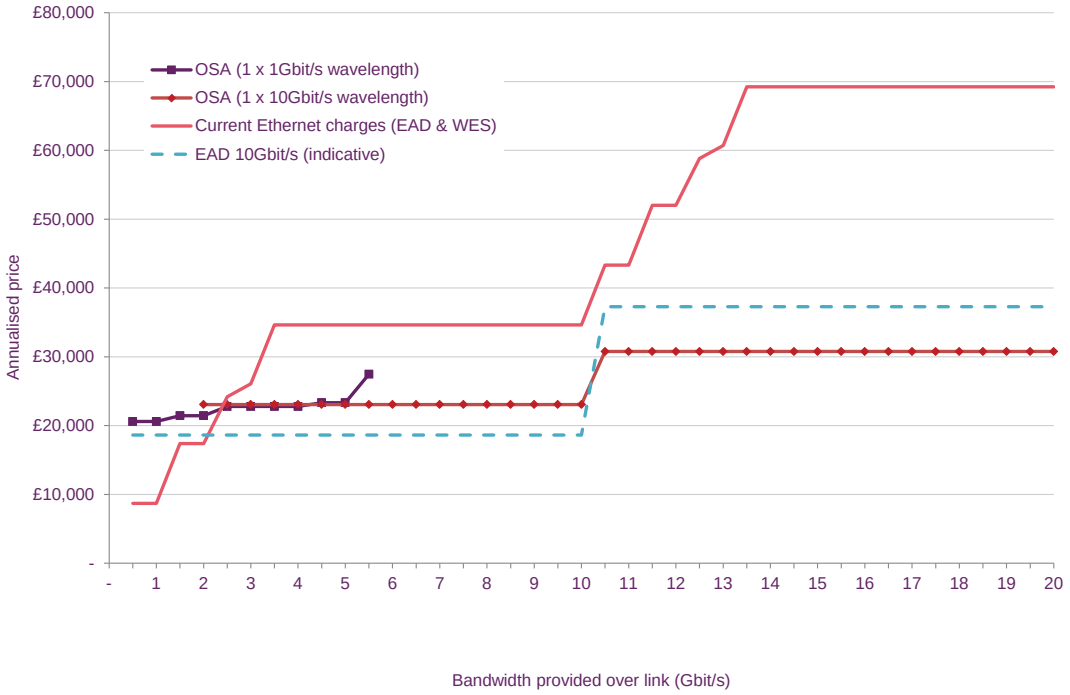
4.51 In the 2013 BCMR, we observed a large gap between prices of 1Gbit/s Ethernet services and Ethernet services above 1Gbit/s and WDM. We relied on BT prices, because the available evidence suggested price differences appeared driven to a significant extent by differences in the cost of equipment. We discuss below that these equipment costs have narrowed and suggest smaller cost differences between bandwidths when taking into account duct and fibre costs, but we first present updated analysis of BT's prices.

4.52 Since the last review, BT has reduced the price of its WDM and Ethernet 1Gbit/s services and has recently announced indicative prices for a new 10Gbit/s EAD service to be introduced in September 2015 at lower prices than its current single service 10Gbit/s Ethernet product.[86] We have repeated this price analysis in Figure 4.1 below based on the latest BT wholesale charges for Ethernet services and the equivalent WDM services for a given bandwidth.[87]

[86] Prices for EAD 10Gbit/s are indicative: https://www.openreach.co.uk/orpg/home/updates/briefings/ethernetservicesbriefings/ethernetservicesbriefingsarticles/eth02115.do

[87] Prices calculated on an annualised based, so include fixed annual rental fees, any distance-based charges (assuming a 10km main link) and upfront connection charges spread over a 3-year contract term.

Figure 4.1: Relative service-based prices of single service Ethernet (EAD and WES) versus WDM services (OSA) for a 10km link



Source: Ofcom 2015, based on BT price lists.

4.53 If we focus only on BT's WDM services (OSA), then we observe that they are sold at a significant premium to Ethernet circuits at 1Gbit/s.[88] We also observe significant price differences between Ethernet 1Gbit/s and BT's currently-available legacy higher bandwidth 10Gbit/s (WES) Ethernet services. However, as depicted in Figure 4.1 above, we put less weight on these comparisons because BT itself plans to introduce a more modern 10Gbit/s EAD Ethernet service. BT's indicative prices for EAD 10Gbit/s suggest significantly cheaper prices than the WES 10Gbit/s service.

4.54 We observe that a gap remains between the price of BT's 1Gbit/s and 10Gbit/s Ethernet services. However, the differentials are far less stark than in 2013. We now consider additional evidence on the costs and OCP prices across the product range.

Cost differentials between services have narrowed

4.55 In the 2013 BCMR we placed significant weight on the observation that BT's very high bandwidth services entailed substantially greater equipment costs than its lower bandwidth standard Ethernet services. However, an important feature of telecommunications markets is that the cost of equipment declines quite rapidly over time such that we can expect these cost differentials to diminish.

4.56 In light of this, we have examined whether it is still true that there is a clear difference in the cost of equipment used in supplying standard Ethernet services at 1Gbit/s or below and very high bandwidth services (using WDM or standard Ethernet). We set

[88] We note that this result is not dependent on the contract length chosen and holds for one year and five year contracts.

out below our view that the differences are far less significant than at the time of our previous review. [89]

Table 4.2: Comparison of per circuit equipment costs for higher bandwidth CISBO services[90]

	1Gbit/s		10Gbit/s	
	Ethernet 1Gbit/s	WDM 1 x 1Gbit/s wavelength	Ethernet 10Gbit/s	WDM 1 x 10Gbit/s
BT – 2012/13	[✂]	[✂]	[✂]	[✂]
BT – 2015	[✂]	[✂]	[✂]	[✂]
[✂]	[✂]	[✂]	[✂]	[✂]

Source: Ofcom 2015, based on s.135 requests.

4.57 The evidence, presented in Table 4.2 above, shows that the cost of modern Ethernet equipment at 10Gbit/s is significantly lower than the cost of the equipment used with BT's legacy WES/BES services at 2.5 and 10Gbit/s. Therefore, there has been a significant closing of the cost differential between single service Ethernet at 1Gbit/s and 10Gbit/s.[91] Differences between the costs of Ethernet equipment and those of WDM equipment remain more significant. For example, the cost of equipment associated with the WDM service would be just under [✂ ✂] and just under [✂ ✂]. This compares to around [✂ ✂].

4.58 However, it is important to note that equipment and other upfront costs[92] are only one element of the cost stack, which will also include other costs such as duct and fibre. These costs (in particular, the costs of duct) are typically a higher proportion of the total cost of providing a service and they do not increase with the bandwidth of the service. Given that dig distances are a key cost driver, this will diminish the importance of any differences in equipment costs.

[89] Our analysis is based on cost data provided by BT and [✂] in response to s135 requests, and was complemented by discussions with OCPs.

[90] That is, including the cost of equipment at both ends of the circuit.

[91] For example, the total costs of equipment per circuit for a 1Gbit/s Ethernet service would be less than [✂], whereas the cost of single service Ethernet at 10Gbit/s would be [✂]. The declines in Ethernet are very significant compared to cost estimates provided by BT for its WES and BES services, which were [✂] for WES 2.5Gbit/s and [✂] for 10Gbit/s.

[92] In addition to equipment costs, there could be other costs which are higher for high bandwidth and WDM services. For example, additional management or design and testing costs may be incurred for more complex network configurations. However, these observed differences are not likely to be a function of technology or bandwidth choice, but rather are driven by the underlying connectivity needs of a particular customer. At all bandwidths and technologies there will be a range of customers with different needs (i.e. varying levels of network complexity from simple point to point connections to highly meshed multi-site configurations). In this context, it is important to recall that our price analysis is concerned with possible likely substitution behaviour from an end-user perspective. In particular, the complexity of a given end-user's requirements in terms of commissioning and design costs would be quite similar at different bandwidths, whilst such costs might be spread across a number of services of different bandwidths purchased as part of a single contract.

4.59 Hence, a large component of the difference in BT's prices (and underlying costs) of Ethernet and WDM services, is not related to incremental differences in equipment cost.[93] Given this, the fact that equipment costs have fallen over time and can be expected to do so in future means that the cost differences between lower and very high bandwidth CISBO services are far less significant than at the time of the 2013 BCMR.

Product prices and positioning by OCPs

4.60 We have looked at the prices charged by OCPs and at their equipment costs for high bandwidth Ethernet and WDM services. Similar to BT, OCPs' equipment costs are higher than the costs of lower bandwidth standard Ethernet equipment, but the step change in OCPs' prices is not as large as seen for BT's prices. A wider assessment of OCPs' pricing also suggests that a number of BT's rivals have services that 'span the gap' that exists in BT's current product portfolio at higher bandwidths. [94]

4.61 For example, Figure 4.2 below sets out [✂] typical starting prices for services at 1Gbit/s and above. BT's charges often include a 'main-link' distance-based charge. Therefore, to make [✂] charges comparable we have shown BT's charges for a 10km circuit with and without a main link (i.e. lighter segment of the BT chart is the non-distance related costs and the dark segment is the main link charge up to 10km). For example, BT's Ethernet charges at 1Gbit/s (without a distance component) would be about £5k p.a, whereas with a distance element the charge would be nearly £9K p.a.

[93] We have also analysed BT's cost recovery and margins on services at different bandwidths. We note that current WES and BES charges (both rental and connection) are significantly in excess of costs.

[94] As discussed in Section 2, during our evidence gathering phase, we discussed with CPs (both BT and OCPs) their pricing and commercial strategies for business connectivity markets.

Figure 4.2: Comparison of BT charges relative to [✂][95]

[✂]

Source: Ofcom 2015, based on published BT charges and indicative [✂] prices

4.62 As with the cost estimates, once [✂] prices are included in the assessment, it is difficult to see a clear break in the pricing schedule between high bandwidth and WDM products and single service Ethernet products. These comparisons are not just theoretical as we know that [✂] has successfully used its [✂] to compete both with BT's WDM services and 1Gbit/s Ethernet services. [✂

✂].

4.63 We also note that there is some diversity in operators' network deployment strategies, that may blur the previous distinctions made between a fully dedicated end-to-end WDM service and 'single service' Ethernet. Operators are now using WDM equipment in the network in ways that allow them to provide the benefits of rapid deployment and scalability to users without the cost of WDM equipment having to be recovered solely from a single end user. For example, SSE have deployed pre-installed data centre connectivity using WDM[96] and Virgin Media's 'national HCS'[97] service makes use of flexible WDM network technologies.[98] These WDM

[95] Price comparisons are based on service-based charges over a three year contract and BT's charges include any upfront connection and equipment costs. [✂] charges reflect its estimates of typical market-based charges for these services on the assumption that no network extension costs are required.

[96] http://www.ssetelecoms.com/general-admin/uploads/SSET1019_DS_WAVE-length_serv_V51.pdf

[97] http://www.virginmediabusiness.co.uk/Documents/VMB_DS_HCSBM.pdf

[98] ROADM deployments allow transparent dedicated long distance wavelengths to be offered over a shared WDM network. While not a necessarily a new technology, we consider that there is now greater evidence that it is being deployed for example at datacentres and in support of national connectivity.

retail services are delivered with Ethernet interfaces that make use of 'shared' WDM infrastructure, which means that once an end-user is connected, provided the CP has spare capacity, it should be able to offer quickly and at low incremental cost additional service connections to the same end user or similar service connections to other end users.

4.64 The implication is that these services can be deployed quickly, for initial and additional service connections but without a large premium for each end-user where dedicated end-to-end WDM systems are deployed. This can be seen either as price convergence, with reductions in the price of WDM or near-WDM quality services bringing them closer in price to Ethernet services, or as convergence in the quality of WDM and other services. The result appears increasingly likely to be a continuum of retail services overlapping in price, bandwidth and quality.

4.65 Indeed, we note that, in its response to the 2012 BCMR Consultation, Sky considered that the MISBO market definition 'overlapped' with AISBO for similar reasons. In particular, Sky submitted that our wholesale product market definition was unclear as BT's EBD services at 1Gbit/s were treated as 'single service Ethernet' AISBO products even though they were provided over WDM-backhaul links within BT's network. In the last review, we argued that services such as EBD services that made use of WDM as an upstream input were different to a "WDM service". We observed that EBD services were only offered as a single 1Gbit/s Ethernet circuit, and the user of the service had no inherent capability to support multiple interfaces or to provide scalable bandwidth as is the case for a fully functioning "WDM service" such as BT's OSA. If a customer pays for a complete end-to-end WDM service it has the full capacity of the WDM-equipment available exclusively to that customer alone. However, as discussed above, CPs are deploying Ethernet and WDM services which significantly blur these distinctions.

4.66 We conclude from our analysis of the cost and pricing evidence above that while there is differentiation across the product range, it does not point to a clear "break" in the chain between very high CISBO on the one hand, and CISBO of up to and including 1Gbit/s on the other hand.

4.2.5.3 Analysis of competitive conditions and BT's service shares in very high CISBO

4.67 As is discussed in sub-section 4.3.5.1 below. BT's share in very high CISBO is substantially lower than for CISBO up to and including 1Gbit/s, and is below the levels normally associated with single firm dominance. However, we do not believe that these service share differences point to a fundamental and sustainable difference in competitive conditions to the rest of the CISBO market, such that it would be appropriate to define a separate product market. The reasons and considerations supporting this view are presented in sub-section 4.3.5.1 below.

4.2.6 Dark Fibre sold to end customers

4.68 In the BCMR 2013, BT submitted that users of very high bandwidth leased lines were able to use dark fibre as an alternative to a leased line purchased from BT. BT argued that this was a further significant competitive constraint in the MISBO market. These dark fibre sales are directly to end customers i.e. they do not include sales of dark fibre to operators, which are already included in our service share analysis.

4.69 However, in the light of research we carried out, we concluded that use of dark fibre would only be a realistic option for a very small minority of end users and did not impose a material constraint on BT. The main reasons for this conclusion were:

- The vast majority of users were considered unlikely to have the skills or capability to self-supply and manage their own networks. Of the end-users that we identified as self-suppliers, the vast majority were very large and sophisticated customers, for example large education and financial organisations and utility companies, with more complex requirements even than most other very-high-bandwidth customers. Many of them used dark fibre in order to have control over their network.

- Research among users of very high bandwidth connectivity services found that those organisations not using dark fibre or only using a small amount:

  - felt that they lacked the skills to buy and use dark fibre, or;

  - found it was generally cheaper to use lit services for their current bandwidth requirements[99], or;

  - said that it was difficult to get dark fibre outside London.

4.70 We concluded that, although including dark fibre sales in the market shares would have some impact on the estimates, this was driven by a minority of very high bandwidth connectivity end-users that required very large capacities. We did not consider that dark fibre was a credible alternative for the majority of end-users. We also noted that the service notionally provided by such dark-fibre users to themselves was not marketed, and unlikely to be offered to other end users in competition to services supplied by CPs. Any general constraining effect on prices was therefore likely to be limited.

4.71 We have revisited these issues in this review, examining dark fibre usage to see:

- how much dark fibre is sold to end-users;

- which services it is being used to provide; and

- where it is being used and by whom;

in order to determine:

- the quantitative impact inclusion of dark fibre sales would have on different market segments;

- the geographic pattern of its impact;

- whether dark fibre use is still confined to a small number of very large users; and

[99] The research suggested that dark fibre tended to be economic when speeds greater than 10Gbit/s were required. One interviewee suggested that the threshold for using dark fibre was even higher at 40Gbit/s. See paragraph 7.569 of the BCMR 2013 Statement. See also paragraphs 7.376, 7.394, 7.568 and 7.571 – 7.572.

- whether it is being used flexibly as an upstream service supporting a range of active services across different market segments.

4.72 Our estimates of the volume of dark fibre sales to end-users, compared to active sales in the CISBO market as a whole and in the very high CISBO segment are shown in Table 4.3 below.

Table 4.3 Dark fibre and CISBO volumes

Market segment	CLA	LP	CBDs	Rest of UK (excl. Hull)	UK Total
CISBO	32,766	12,436	13,858	259,332	304,534
Very high CISBO (incl. MNO backhaul)	2,142	796	224	7,814	10,752
Dark fibre	1,385	273	186	3,793	5,451

Source: Ofcom analysis. Geographic areas used in this table – the CLA, LP, CBDs, RoUK, and UK Total – are defined in section 4.3, paragraph 4.87.

4.73 Dark fibre volumes are small in relation to CISBO volumes overall so including them in the CISBO market would make little difference to market shares. However, dark fibre sales might be more significant when compared to volumes of very high CISBO, if dark fibre is being disproportionately used to deliver high bandwidths or WDM based services. We have therefore tried to estimate the proportion of dark fibre sales that is used for providing very high bandwidth connectivity.

4.74 We do not have information on customer usage, so we have addressed this question by using information from the main providers on the identity of their dark fibre customers. We know that universities, media and finance companies are the most likely to use dark fibre for very high bandwidth connectivity. If we use the proportion of sales to these customers as a proxy for the proportion of dark fibre used to provide very high bandwidth connectivity, then we find that it is between about 10% and about 30% depending on supplier. Then, if we assume for illustration that 2-3 wavelengths are lit on each fibre on average (which is an assumption we made in the 2013 BCMR), we estimate that the equivalent of about 1,700-2,550 very high bandwidth ends are self-supplied using dark fibre. Including these in the very high CISBO would result in a material reduction in BT's share in very high CISBO in RoUK, including or excluding MNO backhaul.

4.75 As Table 4.3 (above) shows, most dark fibre use takes place in London, in the CLA in particular. When we analyse the geographic distribution of dark fibre usage outside London (so in RoUK) in more detail, we find that most postcode sectors contain no dark fibre ends. However, postcode sectors where there is at least one dark fibre end are scattered throughout the UK and are not concentrated in the large cities outside London (the "CBDs"). Those postcode sectors with more than 10 dark fibre ends (78 out of 446 sectors with at least one dark fibre end) account for some two-thirds of the total, with an average of 25 ends per sector. In fact the postcode sector which has the largest number of ends is a Bath postcode, and 130 of the 144 dark fibre ends in

that sector are purchased by a single customer in the publishing sector. Other large users appear to be media companies, universities, colleges and local authorities. The picture is one of a large proportion of dark fibre ends being sales to particular customers who buy a large number of ends at one location, and from one supplier. We consider that this reinforces our view that dark fibre sales to end users are a niche and not a guide to competitive conditions more generally.

4.76 Moreover, it also follows from this that most dark fibre seems likely to be used outside the very high CISBO segment. Indeed for users of dark fibre themselves, the boundary between product segments observable in active services makes little sense. The supplier of the dark fibre may itself not know what service is being provided over it, especially if it is part of a large, possibly multi-site, contract. Usage may also change over time if the need for capacity between different sites changes. It is even more difficult, conceptually, to speculate about the alternative active service that a dark-fibre user might have purchased, had it chosen to do so.

4.77 In the light of this, we consider that, whilst dark fibre usage may be confined to a niche in *customer* segment terms, in *product* segment terms it is a factor which tends to broaden the market. So, if use of dark fibre extended to a broader range of retail customers, then this would support a broad rather than a narrow market definition in any case. We note that dark fibre is, by its nature, capable of being used to supply a service of any bandwidth and interface.

4.2.7 Product market definition proposals

4.78 We include EFM in the CISBO market but exclude asymmetric business broadband (NGA).

4.79 We do not find separate markets for particular segments of the CISBO product range. We consider that the evidence on quality, functionalities, pricing and costs of equipment is consistent with a chain of substitution linking CISBO services at differing bandwidths and interface types, all of which are therefore part of a single market for CISBO services. In summary:

- CPs have adopted a range of different network deployment strategies that make the differences in service features and quality between single service Ethernet (with WDM in the network) and retail WDM (with WDM equipment at the customer premises) more difficult to identify.

- Differences between the costs of equipment used for providing single service Ethernet (of differing bandwidths) and WDM services have narrowed and are now small as a proportion of the total costs involved in providing services.

- Price and cost differences between 1Gbit/s EAD products and higher bandwidth Ethernet products or WDM have narrowed and there is no longer any clear “break” in the product chain above 1Gbit/s.

4.80 Given also the fundamental similarity in the ability of CPs to compete across the product range using the same infrastructure we propose to define a single CISBO product market, including CISBO services of all bandwidths and interface types. While we referred to difference in service shares between lower bandwidth and very high CISBO being more significant, we noted that we would explain our reasons for placing limited weight on service shares for the very high CISBO segment in our assessment of competition in sub-section 4.3.5.1.

4.81 We have considered the position of dark fibre (more particularly, dark fibre made available by CPs on commercial terms) and the extent to which it constrains competition for the supply of CISBO services. While some end customers use dark fibre as an alternative to leased lines, this is a niche customer segment and as such we do not expect dark fibre to have a material impact on competition for CISBO services for customers in general.

4.3 Geographic market analysis for CISBO

4.3.1 Introduction

4.82 In this section we present our proposals on the identification of relevant geographic markets for supply of CISBO services. We do this in four stages:

- In sub-section 4.3.2 we identify candidate geographic areas, which we proceed to analyse in more detail;
- In sub-section 4.3.3 we explain the approach followed in delineating the boundaries of the geographic areas identified in 4.3.2, and we present the precise delineations of these areas;
- In sub-section 4.3.4, we assess the degree and nature of competition in the areas identified, and define the geographic markets for CISBO; and
- In sub-section 4.3.5, we present our assessment of competitive conditions in very high CISBO in light of the data we present in this section on geographic variations in competition. The analysis here supports our Section 4.2 proposal that there is a single CISBO product market.

4.3.2 Identifying distinct geographic areas

4.83 In accordance with the Guidelines, our geographic analysis seeks to determine where there are geographic areas with competitive conditions which are clearly distinct from the surrounding area, and within which competitive conditions are broadly homogeneous.[100]

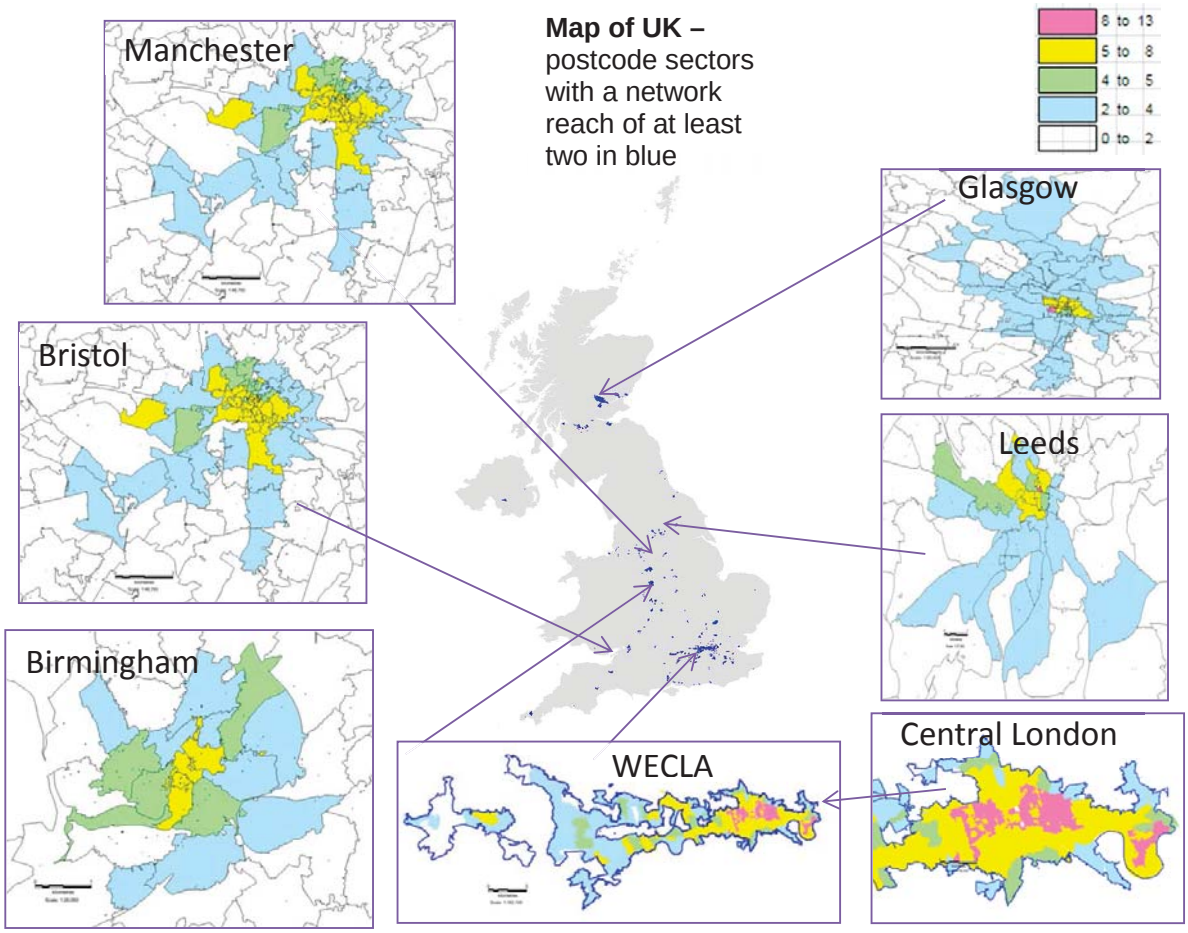
4.84 As rival infrastructure is the main determinant of competition, our approach to identifying areas with distinct competitive conditions has been based primarily on identifying and analysing variations in the extent of rival infrastructure. We refer to Annex 21 for a more detailed outline of the approach followed in defining the geographic scope of markets.

4.85 Figure 4.3 below shows how the presence of rival infrastructure – as estimated using our network reach analysis – varies across the UK, and presents larger scale

[100] As in the BCMR 2013 we focus on contiguous geographic areas of material scale (in terms of number of leased lines supplied and businesses). We do not attempt a more fragmented assessment, e.g. of individual businesses or isolated “islands” where rival network reach is present. We do recognise that there will be variations in competitive conditions within our geographic delineations, but we do not think it would be either practicable, proportionate or appropriate to seek to evaluate market conditions for very small areas. We have considered some of the more exceptional cases in our assessment of datacentres and core nodes, where we are proposing to remove some connections from the regulated sphere recognising that there is more effective competition at these network hubs than elsewhere in the geographic areas they are located.

illustrations for London and central areas of five other large cities where the presence of rival infrastructure appears to be considerably greater than in the rest of UK. Differences in the network reach values of the postcode sectors shown in Figure 4.3 are indicated using different colours.

Figure 4.3 Distribution of network reach values across postcode sectors in the UK



Source: Ofcom 2015.

4.86 We use a measure of "network reach" to identify how much rival (thus competing with BT) infrastructure is present in an area. Text box 4.1 below explains what we mean by "network reach".

Text box 4.1 Explanation of network reach analysis

Network reach
When we refer to the "network reach" of an area, usually a postcode sector or group of postcode sectors, we mean the average number of OCPs with network within a given "buffer distance" of the large businesses in that area. Network reach analysis determines on a postcode sector basis the number of OCPs with infrastructure sufficiently close to businesses to be (potentially) able to compete to supply services to those businesses.

We measure the buffer distance between a business site and a "flexibility point" on a CP's network. A flexibility point is a point on an existing network where a CP can add new fibre in order to connect it to end-users. Flexibility points may, for example, be buildings where fibre terminates on an Optical Distribution Frame or underground chambers where the fibre can be accessed, or where ducts meet at a junction.

We look at the network reach metric under different assumptions about the buffer distance. Note that the buffer distance as measured will not map perfectly onto the actual "dig distances" required since OCPs may not always dig from flexibility points or because a direct line dig from the flexibility point to the customer premises is not feasible. We explain our choice of buffer distance assumptions in more detail in Annex 18.

4.87 Informed by the network reach analysis we carried out, we identify the following areas where there appear to be potentially significant differences in the degree of presence and depth of rival infrastructure from:

- **Central London Area[101] (CLA)**, where there are many rival networks in close proximity to businesses, reflecting the rollout of infrastructure by CPs seeking to serve the high density of (potential) demand for CISBO services in this area;
- **London Periphery (LP)**, where there is some rival network to BT, but substantially less than in Central London Area;
- The **Rest of the UK (RoUK)[102],** where in most places there is not any or or only one OCP, typically Virgin Media, present.
- Within the RoUK are the **Central Business Districts (CBDs)** of other urban centres,[103] which tend to have similar numbers of rival networks as the London Periphery, but each individual district tends to be much smaller in terms of number of businesses and CISBO services supplied.

[101] We refer to paragraphs 4.88 to 4.99 later in this Section, and paragraphs A15.155 and further in Annex 15 for an explanation of the approach followed in delineating these four geographic areas, and the subsequent delineation.
[102] We define the Rest of UK (RoUK) as the area of the UK outside the CLA, the LP and the Hull area. The RoUK includes the Central Business Districts (CBDs), an area which we also consider separately.
[103] CBDs are the collection of the central business districts in Birmingham, Bristol, Glasgow, Leeds and Manchester.

4.3.3 Delineating boundaries of geographic areas

4.88 In section 4.3.2, we identified geographic areas with different levels of rival infrastructure, which we consider a driver for variations in competitive conditions. We now summarise our approach to defining boundaries of these geographic areas, later used for defining boundaries of relevant geographic markets. Annex 15 presents our assessment in greater depth.

4.3.3.1 Defining the CLA boundary

4.89 Our starting point is that we regard the CLA as an area of especially dense concentration of businesses and competing networks broadly similar to the CELA defined in the 2008 BCMR.

4.90 We now need to define the boundary of the CLA more precisely. As noted before, we define the boundaries based on the degree of presence and depth of coverage of rival infrastructure. If we can identify an area where competition is effective and no CP has SMP in the market for CISBO services, we can deregulate it fully. For that reason, we define boundaries of the CLA using a set of appropriate criteria ensuring that the resulting area has sufficient level of competition to protect users of CISBO services against the exercise of market power. This requires most if not all (potential) users of CISBO users to have a number of OCPs with network sufficiently close to their sites for them to be willing and able to compete for supply of CISBO services to these sites.

4.91 First we identify those postcode sectors in which competition is likely to be fully effective across a range of products as a separate market, which we call the Central London Area (CLA) To identify the boundary of this market we have created a “Boundary Test”. The boundary of the CLA geographic market is formed by postcode sectors which fulfil at least one of the conditions of the Boundary Test:

- postcode sectors where businesses have on average five or more OCPs within a buffer distance of 100m;
- in addition, postcode sectors where businesses have on average four or more OCPs within 100m and in addition, 90% of the businesses are within 100m of at least two OCPs.

4.92 The requirement for average network reach of five, or four if 90% also have two OCPs within reach:

- Allows for at least two competing offers (i.e. offers that compete with BT’s) on average, even if the customer needs to contract with two CPs for resilience purposes (i.e. at least two non-overlapping pairs of OCPs);
- Increases the likelihood that BT is constrained by competition as all businesses are likely able to get multiple competing offers; and
- Minimises any risk of tacit collusion.

4.93 We use a buffer distance of 100m[104] to identify areas where competition in the CISBO market is effective. Using a buffer distance of 100m:

- Is consistent with the data on actual dig distances which CPs provided (see Annex 18).
- Is broadly consistent with what CPs have told us. The submission by Towerhouse Consulting, for example, suggests a buffer distance of 75m.[105]

4.94 The 90% test (that is, requiring 90% of business sites to be located within buffer distance of OCPs):

- Allows for the possibility that an average measure may not be representative of competitive conditions at all business sites;
- As far as possible, ensures that most businesses should be able to get a competitive offer. In addition, the 90% threshold ensures that postcode sectors identified are not unduly affected by outliers or data anomalies (as might be the case when requiring 100% of businesses to be located within 100m of a certain number of OCPs).

4.95 We make two further comments relevant to our delineation of the CLA boundary.

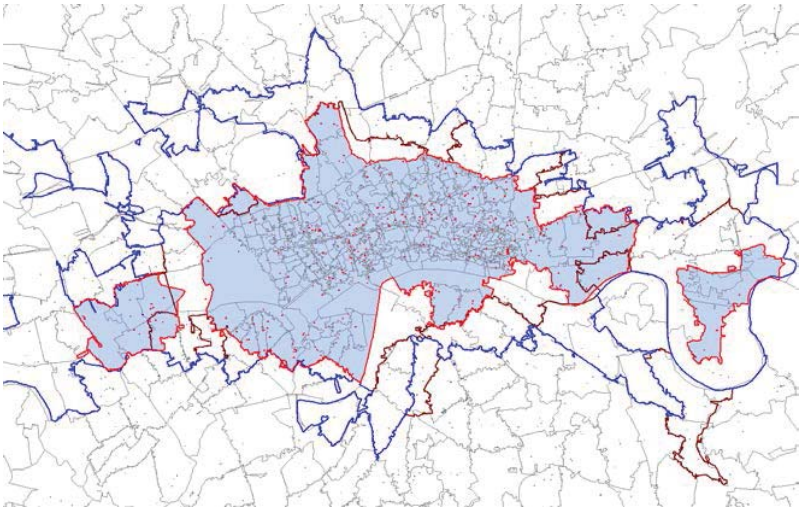
4.95.1 We include postcode sectors that are largely surrounded by postcode sectors meeting the above criteria, but that do not meet these criteria themselves. Our review – see Annex 15 for details – shows that these sectors can safely be included as the number of businesses with supplier choice of less than four OCPs is limited, and most of the businesses concerned have supplier choice of at least three (in addition to BT).

4.95.2 We include the non-contiguous areas in Kensington (West London) and Docklands (East London) in the CLA because they meet the above criteria and have strong economic and physical links to the main block of CLA sectors. The reasoning is thus somewhat similar to that underpinning the inclusion of some postcode sectors in Slough in the WECLA in the 2013 BCMR.

4.96 The area of the CLA geographic market we identify is marked in blue shading and bounded by a red line in Figure 4.4 below. The map also shows the borders of WECLA used in BCMR 2013 (blue line) and of CELA used in BCMR 2008 (brown line).

[104] We consider that there is some argument for deploying shorter distances between 50m and 100m, perhaps combined with a requirement for a smaller number of OCPs to be within the chosen buffer distance. However, we do not think that deploying a shorter distance would make a material difference to our proposals. A more detailed analysis of this issue can be found in Annex 18.
[105] See the Towerhouse report, paragraph 3.54, commissioned by Colt, Sky, TalkTalk and Vodafone.

Figure 4.4 – Central London Area (CLA)



Source: Ofcom analysis.

4.97 However, drawing a precise boundary is never straightforward and, in principle, the boundary of the CLA might be set taking account of a range of measures of competitive intensity. We also find that, however the precise criteria are determined, the area which emerges is very similar to the CLA. This gives us confidence that the proposed market boundary is robust. More details on the analysis resulting in the CLA definition, on the results of alternative tests and on application of the boundary test in the CBDs are provided in Annex 15.

4.3.3.2 Boundary of the other geographic areas

4.98 The London Periphery has an outer boundary (between the LP and RoUK) and an inner boundary (between the LP and the CLA).

4.98.1 The LP's inner boundary is determined by the CLA boundary discussed above.

4.98.2 We propose to retain the same outer boundary for the LP as for the WECLA defined in the 2013 BCMR. This is because, although there have been changes in rivals' networks at the WECLA edges, the main difference between the WECLA and other areas is the high concentration of rival infrastructure and businesses in central London, not the periphery. We reflect the former in our proposed definition of the CLA, and this does not have any implications for the outer boundary of the WECLA or LP. Moreover, in the absence of a major shift in competitive conditions we think there are benefits in terms of regulatory stability in retaining the original outer boundary. In particular, maintaining an unchanged outer boundary allows for continuity of remedies within the area of the old WECLA in a relatively straightforward way.

4.99 We define the Rest of the UK as the UK outside the CLA, the LP and the licensed Hull area.

4.100 In our assessment, we define the CBDs as the blocks of contiguous postcode sectors with a network reach of two or greater in the central business districts of the five

metro areas. More details on the definition of CBDs and the delineation of the boundary of CBDs can be found in Annex 15, paragraph A15.159.

4.3.4 Assessment of competition in and across geographic areas

4.3.4.1 Evidence of competitive conditions using four indicators

4.101 We look more closely at competitive conditions in each of the geographic areas identified and subsequently delineated in the two preceding sub-sections to inform our product and geographic market definition. We have examined evidence on four indicators of variations in competitive conditions by geographic area, namely:

1. Presence of rival infrastructure;
2. Distribution of service shares;
3. Pricing and profits; and
4. Other structural indicators of competition.

4.102 Before presenting evidence (and our assessment of evidence) on these four indicators, we explain our understanding of these four indicators, and their relevance to analysing geographic variations in competitive conditions.

1. Presence of rival infrastructure

4.103 The degree of competition that BT faces is likely to be strongly influenced by the degree to which rival infrastructure is present in a geographic area. Key factors influencing the potential for effective competition are:

a) **Proximity of rival networks:** The closer rival networks are to actual and potential customers of leased lines, the more effective the competition to BT.[106] Differences of a few tens of metres may determine whether a CP can profitably serve a business or not. Where provision of new sites requires OCPs to extend their network, they are likely at a disadvantage vis-à-vis BT as BT, because of its ubiquitous duct network, typically has existing connections to sites. As the costs of network extension are significant and sunk, and form a major proportion of total costs of providing leased lines services, OCPs incur much greater forward-looking incremental costs when they do not have an existing connection or network in close proximity to sites.

   There is no single cut-off distance within which a OCP can profitably supply a service so we look at proximity using a range of distances between the rival networks and sites of businesses:

   - As in the BCMR 2013, we use 200m as our minimum necessary condition for identifying areas where there is somewhat more competition than in most of the UK, and where we recognise there is some potential for competition. As in BCMR 2013 we have identified postcode sectors where on average businesses have two networks (in addition to BT) located within 200m as a way to identify sectors and areas with potential for competition.

[106] Annex 13 explains the impact of OCP having network infrastructure in proximity of sites on their ability to compete with BT for provision of leased lines to sites.

- However, as discussed in Section 4.3.3 we consider that competitive constraints are more likely to be effective across the full range of CISBO services where there are a number of OCPs within 50m -100m of customers. We also examine the number of OCPs within this range of distances in order to identify geographic areas where the CISBO market (at all bandwidths) is effectively competitive.

b) **The number of rival networks and their coverage.** The greater the number of networks that are located near to businesses, the more likely it is that BT will face effective competition for supply of leased lines to these businesses. We also consider the proportion of businesses that would have a given number of rival networks within specified distances.

- In general, the presence of only one rival supplier to BT will not be expected to generate a competitive outcome, and the more rival suppliers that there are, the greater the degree of competition that would be expected.

- There may be variation in the degree to which different OCPs concentrate on different customer segments or product categories. Accordingly, whilst the presence of multiple networks nearby makes it more likely that customers will be competitively served, we cannot assume that all rival networks will compete for supply of all services to all customer types.

- As noted above, we think that in some cases even a 100m dig distance will overstate the distances CPs are likely to consider when extending their networks. The more firms that meet the 100m buffer distances, the more likely it is that some networks will be significantly closer to customers than 100m.

- Some customers may also value having multiple connections for resilience purposes, which requires more OCPs to have networks nearby in order for competition to occur.

- In our network reach analysis, we measure the average number of OCPs available to businesses in a postcode sector, but there will always be some businesses that have a lower than average number of rival networks within reach. Hence we also consider the proportions of businesses with a sufficient number of rival networks close enough to provide effective competition.

4.104 We note that our assessment of the degree of rival infrastructure required to conclude that BT faces sufficient competition to prevent the exercise of SMP interacts with our assessment of other evidence on SMP. If other indicators suggest that BT may have SMP, we are likely to need stronger evidence that there are several rivals to BT with extensive infrastructure located close to customers in order to conclude that BT does not have SMP.

4.105 Based on the above, our approach uses a range of buffer distances, up to 200m, to identify geographic markets. Identifying postcode sectors with a network reach of two or above for a buffer distance of 200m – as in the 2013 BCMR – provides an appropriate way of identifying sectors with greater potential for competition than the UK overall. That is, where postcode sectors have an average network reach of two or above, we consider there is at least some potential for competition. However, as we found in previous BCMR reviews, we do not consider geographic areas satisfying only this threshold to likely be fully competitive. In order to identify geographic areas where rival infrastructure is sufficiently dense and extensive for competition to be

effective across the CISBO market, we consider it appropriate to require a higher density of rival infrastructure located closer to businesses (see Annex 15).[107]

2. Distribution of service shares

4.106 We look at the distribution of CP service shares in the supply of CISBO (and segments of CISBO) for each of the geographic areas identified. Annex 15 presents more detailed explanation of the service share analysis we have undertaken, explaining the dataset, methodology, and practical choices.[108]

4.107 Service shares provide a potential indication of the extent to which presence of rival infrastructure has translated into competition for supply of CISBO services.

4.108 Small variations in distribution of service shares across areas may not be very informative and, although service shares for CISBO segments vary by geographic location, in particular for the cities outside London, such variations need to be interpreted cautiously as the number of circuits can be very small. It is also the case that if prices are not at their competitive levels, service shares might give a misleading impression of the extent to which competition is effective.

4.109 In addition to BT's shares, we also look at the service shares of OCPs and the overall level of concentration based on the Herfindahl–Hirschman Index (HHI).[109] Broadly, the greater the number of OCPs which have managed to attain a material share of supply, the stronger is the indication of intensity of competition being greater.

3. Pricing and profits

4.110 If there are differences in the intensity of competition between areas, these may be reflected by differences in prices and profitability. In contrast, geographically uniform prices may be an indicator of homogeneity in competitive conditions. We have looked at whether BT varies its prices by geographic area for different CISBO products, and we have examined qualitative evidence from OCPs as to how their pricing policies vary by geographic area.[110] In addition, we have assessed how BT's profitability of providing CISBO services has varied geographically (and across product lines) over recent years.[111]

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[107] The nature of provision of leased lines implies that we cannot presume that all OCPs with network infrastructure within the assumed build distance of businesses are able or willing to compete for supply of leased lines. This contrasts with competition in wholesale broadband access markets where an operator with presence at the local exchange is likely able to provide services to any site in that exchange area at competitive terms. In the WBA review, we considered that presence of three or more principal operators (including BT) would be enough for that exchange area to be competitive. The incremental costs of providing leased lines depend strongly on the need for and amount of network extension.

[108] The circuit data was provided by CPs. CPs reported the circuits they supplied, and provided additional information on the location, mode of provision (off-net or on-net), bandwidth, interface type and nature of line ends (customer or network) of circuits provided.

[109] Competition is likely to be more effective in areas where there are several rivals making sizeable sales compared to only one or two rivals that account for the large majority of sales. The HHI captures the relative scale of all the firms in a market in a single measure equal to the sum of squared market shares.

[110] CP responses to the Market Questionnaire.

[111] The information relied on for determining BT's profitability – revenue and cost information – is available at the level of the markets where BT was found to have SMP in the previous market review, thus limiting the extent to which a comparison of profitability can support assessment of competitive

4. Other structural indicators of competition

4.111 We look at other structural factors that might indicate variations in the scope for competition across geographic areas, such as the overall size and density of demand and the nature of businesses within a particular geographic area (for example, the large clustering of financial companies located within the City of London).[112]

4.112 We also consider the economic and physical interactions between one area and neighbouring areas. If an area has strong links with a more competitive adjacent area, this may indicate that it has potential to become more competitive over time.

4.3.4.2 Assessment of competition using the four indicators

4.113 Having identified the four indicators along which we use to assess variations in competitive condtions, and having explained why we consider these indicators to be relevant, we now present our assessment of competition. Table 4.4 presents evidence on a range of competition indicators for the geographic areas identified above.

conditions along geographic lines. In the 2013 BCMR, we defined WECLA as a a separate market for the provision of AISBO and MISBO services, respectively.

[112] Demand for leased lines is likely to be greater in geographic areas with a high concentration of businesses overall or an agglomeration of certain industry sectors (e.g. financial, science and tech companies). This may affect competitive conditions as CPs are likely to see greater scope for profitable entry in such areas. CPs are likely to be able to use network infrastructure more efficiently in areas with greater density of high value businesses. In particular, the case for building fibre to a individual enterprise customer may be stronger if other customers are in the immediate locality.

Table 4.4 Overview of relevant metrics in the four key geographic areas

Competitive indicators	Metrics		CLA	LP	CBDs in other cities	Rest of UK (exc. Hull)
Rival infrastructure	Average network reach* (100 metres)		6.2	2.4	2.8	0.8
	Average network reach (200 metres)		8.0	4.1	4.4	1.2
	Average network reach (500 metres)		9.5	6.6	7.2	2.0
	Depth of network reach – 100 metres (200 metres)**	1+	100% (100%)	96% (99%)	97% (99%)	61% (71%)
		2+	99% (100%)	68% (91%)	79% (95%)	15% (30%)
		3+	98%(100%)	40% (78%)	55% (84%)	5% (12%)
		4+	93%(100%)	22% (59%)	30% (65%)	2% (5%)
		5+	83% (98%)	11% (37%)	15% (46%)	0% (2%)
Distribution of service shares	BT share	Low bandwidth TISBO	63%	70%	88%	94%
		CISBO up to and including 1Gbit/s***	46%	50%	47%	57%
		- Low CISBO	41%	44%	40%	46%
		- Medium CISBO	55%	57%	54%	69%
		- High CISBO	34%	44%	47%	64%
		Very high CISBO****	8-11%	14-15%	21%	30-32%
		CISBO Total*** (by revenue)	37%	41%	44%	53%
		CISBO Total*** (by volumes)	44%	48%	47%	56%
	Virgin Media share	CISBO up to and including 1Gbit/s	9%	25%	33%	30%
		Very high CISBO	16-17%	39-42%	57-58%	48-53%
		CISBO Total	10%	26%	33%	31%
	Combined BT and Virgin Media share	CISBO up to and including 1Gbit/s	55%	75%	80%	87%
		Very high CISBO	28%	53%	80-81%	84-85%
		CISBO Total	54%	73%	80%	87%
	Concentration (HHI)	CISBO Total	2,773	3,100	3,395	4,154
Pricing and profitability*****	BT pricing	AISBO	Free connections on EAD 1Gbit/s products between March 2013 and May 2014; uniform list prices otherwise		Uniform list prices	
		MISBO	[✂]		Uniform list prices	
	BT profitability	AISBO	48%		21%	
		MISBO	-		32%	
Other structural Indicators	Number of circuits	CISBO up to and including 1Gbit/s	30,624	11,640	13,634	251,518
		Very high CISBO (incl. MNO backhaul)	2,142	796	224	7,814
	Number of businesses		4,239	3,378	4,428	154,244
	Square kilometres		33	233	132	246,756
	Business density (number of businesses per square kilometre)		1,767	232	62	14
	Linkeages to the centre of London		-	Strong	Weak	Weak

* Average network reach concerns the average number of OCPs with a flexibility point within the buffer distance (100m, 200m, 500m) of businesses. Determined at postcode sector level.
** Depth of rival infrastructure reflects the proportion of businesses in area that are located within the buffer distance (100m, 200m) of X+ OCPs, with X varying from 1 to 5.
*** We refer to Table 4.1 for the terminology used in categorising leased lines services. Low CISBO includes all Ethernet circuits up to and including 10Mbit/s. Medium CISBO corresponds to Ethernet services at bandwidths of more than 10Mbit/s and up to and including 100Mbit/s. High CISBO corresponds to Ethernet services of more than 100Mbit/s up to and including 1Gbit/s. CISBO up to 1Gbit/s includes Ethernet services up to and including 1Gbit/s (and thus covers low, medium and high CISBO). Very High CISBO concerns services capable of supplying bandwidth exceeding 1Gbit/s. CISBO Total covers CISBO of all bandwidths.
**** Shares in the very high CISBO segment are presented as an range defined by very high CISBO shares excl. MNO and LLU backhaul and very high CISBO shares incl. MNO and LLU backhaul.

1. Presence of rival infrastructure

4.114 The evidence on presence and density of rival infrastructure as shown in Table 4.4 above – based on network reach analysis – points to clear differences in the degree of presence and depth of rival infrastructure. The amount and density of rival infrastructure in the CLA is very high, and considerably greater than in the other geographic areas:

- In the **CLA**: we observe that virtually all businesses (>98%) are located within 200m of at least five OCPs, and 93% of businesses are located within 100m of at least four OCPs. Average network reach for the CLA is 8.0 for a 200m, and 6.2 for a 100m buffer distance.

- In the **LP** and the **CBDs**: the extent of rival infrastructure, whilst considerably greater than in the RoUK, is significantly lower than in the CLA. Within the LP, only 37% of businesses have five or more OCPs located within 200m and only 22% have four OCPs within 100m. Average network reach in the LP is 2.4 for a 100m and 4.1 for a 200m buffer distance. The situation in the CBDs is similar: 46% of businesses are located within 200m of at least five OCPs, 30% of businesses are located within 100m of at least four OCPs and the average network reach is 2.8 and 4.4 for 100m and 200m buffer distances respectively;

- In the **RoUK**: rival infrastructure is very limited. Only 30% of businesses have two or more OCPs within 200m, and only 15% two or more OCPs within 100m. We observe very low network reach values of 0.8 for a 100m, and 1.2 for a 200m buffer distance, with [✂ ✂]

4.115 We consider that the evidence on presence and density of rival infrastructure shown and discussed above indicates that the CLA stands apart from the other geographic areas in terms of the presence of rival infrastructure. In light of the weight we place on rival infrastructure as the main determinant of competition for leased lines, we interpret the presence and density of rival infrastructure in the CLA as pointing to businesses in the CLA being considerably more likely to benefit from effective competition (with a number of OCPs in addition to BT being able and willing to compete for supply of CISBO services to their sites).

4.116 We consider that the presence of rival infrastructure of the LP and CBDs points to different competitive conditions in these areas, with density of rival infrastructure significantly greater than in most of the RoUK.

In addition, we note that each of the individual CBDs are far smaller than the CLA and have relatively very few very high CISBO services.

2. Distribution of service shares

4.117 Service shares can also provide some evidence of variations in the intensity of competition across the four geographic areas identified:

- **Total CISBO –** Shares for the whole CISBO market indicate differences between competitive conditions in RoUK (BT's share is 56% by volume) and CLA (BT's share is 44%). The CLA and RoUK also appear distinct from both LP and CBDs, in which BT has comparable shares (48% and 47% respectively). Differences between the four geographic areas can also be observed when looking at individual (bandwidth) segments of the CISBO market.

- **CISBO up to and including 1Gbit/s –** There are geographic differences in shares for CISBO up to and including 1Gbit/s (this includes low, medium and high CISBO) – with BT's share greater in RoUK (57%) than elsewhere though BT's shares remain high in the CLA and LP (between 46% and 50%). This points to the presence of rival infrastructure only having translated to some extent into customer acquisitions by OCPs, even in the CLA.

- **Very high CISBO –** Geographic differences in distribution of shares for very high bandwidth CISBO (excl. MNO backhaul) are greater. BT accounts for 30% in the RoUK, but only 8% in the CLA, 14% in the LP, and 21% in CBDs. Supply of very high CISBO in the CLA and LP is spread across a larger number of OCPs. In the RoUK and CBDs, by contrast, [✂ ✂]. Caution is required however in reading too much into shares in supply of very high CISBO as we explain in greater detail in section 4.3.5 below.

- **Low bandwidth TISBO –** Shares in the supply of low bandwidth TISBO provide further indication of competitive conditions in the CLA and, to some degree in the LP, being stronger than in other geographic areas. BT accounts for virtually all low bandwidth TISBO sales in RoUK (share of 94%), with BT's share being materially lower at 63% in the CLA, and 70% in the LP.[113]

4.118 While we consider the picture of variation in competitive conditions based on distribution of service shares to be less clear cut than the evidence on presence of rival infrastructure, the variations are broadly aligned with differences in rival infrastructure – the CLA appears more competitive, the RoUK least competitive, with the LP and CBDs being broadly similar to each other.

3. Pricing and profits

4.119 BT prices its AISBO products (equivalent to the CISBO services of up to and including 1Gbit/s referred to in this consultation) uniformly, that is, it does not vary its prices by geographic area.[114] In general, such evidence may indicate that variations in competitive conditions are not overly material, as one may expect a CP to differentiate its prices where differences in competitive intensity are material. However, we consider that caution is warranted when drawing inferences on competitive conditions based on BT's pricing of CISBO up to and including 1Gbit/s services, as these services are currently subject to regulation, and the obligation for BT to publish prices of these products may limit the types of discount schemes it can offer.

4.120 The qualitative evidence on pricing of very high CISBO services (equivalent to MISBO services defined in the 2013 BCMR) points to competitive conditions in the CLA and possibly the LP being different from those in the other geographic areas identified. [✂ ✂]. [✂

[113] The relatively low value and legacy nature of TISBO services may explain why BT's share of supply of these services remains very high overall, even in the CLA with its greater concentration of rival infrastructure.

[114] Between May 2013 and March 2014, Openreach applied a temporary geographic discount to connection charges for EAD 1Gbit/s services within what it called the Flex-zone (the area covered by the WECLA). However, this discount was subsequently withdrawn.

✂]. BT does not offer such discounts in the UK outside the WECLA.

4. Other structural indicators

4.121 The evidence on other structural indicators (including business density) points to conditions in the CLA, and to a lesser degree the LP (which however benefits from the presence of links to the most competitive area – the CLA), being different from the other geographic areas. The number of businesses and the demand for leased lines and, in particular, high value services are much greater in the CLA than in other areas, and we consider that this is likely to continue to have a postive effect on the extent to which CPs have been and will continue to compete for supply of CISBO in the CLA.

4.122 In addition, we note that the LP differs from the CBDs in that business density is greater in the LP, the economic and physical links connecting the LP to the CLA are considerably stronger, and the LP is a near-contiguous geographic area whereas the CBDs consist of business districts in five smaller and geographically separate metropolitan areas with, moreover, some material differences between each of them.

Overall view

4.123 The extent of rival infrastructure is the key indicator of intensity of competition. Where we observe a significant difference in the presence and density of rival infrastructure in one area when compared to neighbouring areas and to the rest of UK, we consider this to be a basis for defining that area as a separate geographic market for the purpose of regulatory review.

4.124 The differences in presence and density of rival infrastructure observed are sufficient to consider that there are significant differences in competitive conditions between (i) the CLA, (ii) the LP, (iii) CBDs and (iv) the RoUK. The CLA and the RoUK, in particular, appear distinct in comparison to the other geographic areas, with the CLA clearly having the greatest concentration of rival infrastructure, whereas rival infrastructure in the RoUK is very limited in comparison to the other areas. In our view, based on our understanding of rival infrastructure as the main determinant of competition locally, we thus consider that conditions for competition for the supply of CISBO services are most favourable in the CLA, and least favourable in the RoUK.

4.125 While some of the metrics of rival infrastructure do not in themselves suggest major differences between the LP and CBDs, we observe that some qualitative differences exist between the areas.

- Competition in the LP may be affected by its proximity to, and economic interactions with, the more competitive CLA, and demand-side features point to concentration and value of (potential) demand being greater in the LP.[115]

- There are also differences in the depth of competition in terms of the number of OCPs that managed to attain significant shares in supply of CISBO. This is reflected in the [✂ ✂].

[115] See above.

- We also place emphasis on the fact that – as shown in Annex 15 – the CBDs are made up of a series of much smaller individual areas and that there is significant variation between them in the number of OCPs with network presence and distribution of service shares. Accordingly we do not consider that it is appropriate to assess competition in the CBDs as a single geographic grouping. While competitive conditions in CBDs differ somewhat from those in the RoUK, we do not consider that CBDs warrant to be defined as a separate geographic market. The areas in question are very much smaller than the CLA, and we do not consider that competition across the CISBO market is likely to be effective or sustainable at present or over the market review period in these areas.[116] Instead, we propose including CBDs in the RoUK.

4.3.4.3 Geographic markets identified

4.126 As a result of our analysis of differences in competitive conditions across geographic areas for a range of products (i.e. CISBO services at differing bandwidths) , we propose to define:

4.126.1 A single product market for Contemporary Interface Symmetric Broadband Origination services in the Central London Area (CLA);

4.126.2 A single product market for Contemporary Interface Symmetric Broadband Origination services in the London Periphery (LP);

4.126.3 A single product market for Contemporary Interface Symmetric Broadband Origination services in the Rest of UK (RoUK).[117]

4.127 We refer to Annex 15 for the precise delineation of the CLA, which is done on the basis of postcode sectors. The postcode sectors that make up the proposed CLA and LP areas are also included as part of the proposed SMP conditions at Annex 6. All other postcode sectors are part of the Rest of UK.

4.3.5 Competitive conditions in very high CISBO

4.128 In this section we highlight a specific issue raised in relation to our product market definition and very high CISBO services before proceeding with our SMP assessment for the markets we have identified. We explain in further detail why, although there are some differences in competition conditions that may point to market separation, we do not consider it is appropriate to define a separate market for these services taking into account the available evidence.

4.129 We considered in section 4.2 that evidence on the chain of substitution (and other factors considered) no longer points to a clear break between CISBO services up to and including 1Gbit/s (i.e. Ethernet services of up to and including 1Gbit/s) and very high CISBO (i.e. services capable of supporting bandwidth greater than 1Gbit/s, either Ethernet services of more than 1Gbit/s or WDM services). In addition, we argued above that the fundamental homogeneity of competitive conditions across services provided over a common infrastructure also supports definition of a single market. The chain of substitution and the fundamental homogeneity of competitive

[116] We do comment on BT's market power in the CBDs in our SMP assessment, Section 4.4.3, where further differences between the LP and the CBDs are highlighted.
[117] We note that the RoUK geographic area includes the CBDs which we considered and assessed as a geographic area with potentially distinct competitive conditions.

conditions each provide a strong basis for our market definition. We recognised that, reflecting BT's pricing, BT's service shares in the very high bandwidth segment are lower than in other segments.

4.130 Table 4.5 below presents the distribution of service shares, and the level of concentration in the very high CISBO segment. We note that shares are presented in a range reflecting the differing permutations of service share analysis undertaken. We refer to Table 4.5 above for the distribution of service shares and level of concentration across the CISBO range for the geographic areas considered.

Table 4.5 Distribution of service shares in very high CISBO

		CLA	LP	CBDs	Rest of UK (incl. CBDS, excl. Hull)
Very high CISBO	BT share	8-11%	14-15%	21%	30-32%
	Virgin Media share	16-17%	39-42%	57-58%	48-53%
	Number of circuits	2,038	703	191	5,624
	HHI	2,258	2,059	3,771	3,260

Note 1: BT and Virgin Media shares are presented as an interval defined by very high CISBO shares excl. MNO and LLU backhaul and very high CISBO shares incl. MNO and LLU backhaul.[118]

Note 2: Number of circuits and HHI reported concern supplies of very high CISBO services excl. MNO backhaul.

Source: Ofcom analysis.

4.131 In each of the four geographic areas, BT's share in very high CISBO is significantly lower than its share in any other CISBO segment, varying from 8-11% in the CLA to 30-32% in the RoUK. BT's share in very high CISBO in each geographic area is below the threshold normally associated with concerns for single firm dominance (40%), whereas its share in lower bandwidth CISBO segments is typically at a level that exceeds this threshold, and commonly even above the threshold where a presumption of SMP can be made.

4.132 As explained below, we do not consider that BT's lower shares for very high CISBO imply a fundamental and sustainable difference in competitive conditions to those in CISBO up to and including 1Gbit/s that supports defining a separate product market for very high CISBO.

[118] LLU backhaul in this instance refers to backhaul circuits purchased by large LLU operators that do not have a fixed access network. See Annexes 12 and 15 for further details on this.

- First, we explain why service shares in very high CISBO may not provide a good indication of competitive conditions in that segment.

- Second, we explain that other conditions (relating to the fundamentals of BT's position in the supply of CISBO services) are consistent with a lack of effective competition for very high CISBO, and that this is similar to what we found for CISBO of up to and including 1Gbit/s.

4.3.5.1 Limitations of service shares in very high CISBO

4.133 We recognise that estimation and interpretation of service shares in very high CISBO, in particular, are subject to a number of limitations raising uncertainty surrounding estimates, and reducing reliability of service share evidence as a good indicator of competitive conditions. These limitations are discussed in detail in Annex 13 but include:

- Missing information on on-net provision;

- The effect of limited volumes;

- The effect of migration from medium/high to very high CISBO; and

- The effect of CPs' pricing and positioning of their CISBO products.

4.3.5.2 Other evidence points to a lack of effective competition

4.134 In the RoUK there is only one large rival to BT, with Virgin Media accounting for the large majority of the alternative sales of very high CISBO. The [✂ ✂], indicating a high concentration of supply, albeit with BT as the smaller of the two main suppliers. We think the presence of one major rival is unlikely to offer an effective constraint on BT as the segment evolves.

4.135 As noted above, BT's profits and prices in this segment continue to be very high. BT's return on capital employed (ROCE) on provision of MISBO services (equivalent to very high CISBO) in the UK outside the WECLA increased sharply from 11% in 2012/13 to 32% in 2013/14, well above BT's cost of capital and consistent with our inference of prices being well above the competitive level. As well as providing part of the explanation as to why Virgin Media may have made substantial inroads into BT's sales, high profits and prices are consistent with our view of very high CISBO (in the LP and the RoUK) being characterised by a lack of effective competition.

4.136 We do not consider that the differences we observe in service shares between CISBO up to and including 1Gbit/s and very high bandwidth CISBO in a given area imply any fundamental and sustainable difference in competitive conditions. As noted in section 4.2 above, our approach to identifying areas with distinct competitive conditions is based primarily on identifying differences in the presence and depth of rival infrastructure between areas, whereas we consider that competitive conditions should be similar across bandwidth segments within the same area.

4.137 In addition, we consider that BT's strong position across the CISBO range is likely to reassert itself over time as prices change and users move between bandwidth segments. Nonetheless, we do recognise that in the short run OCPs appear to be winning a large share of very high CISBO and we take this into account when deciding on which remedies are appropriate.

4.138 In summary, we conclude that the chain of substitution and the fundamental homogeneity of competitive conditions between CISBO services of differing bandwidths point to a single market. Some of the evidence on service shares suggests that, conditioned by current prices, OCPs have so far won a greater share of very high bandwidth customers than of lower bandwidth customers. We do not consider that this is inconsistent with our proposal to define a single CISBO product market. We also note that the weight we put on infrastructure presence is reflected in our no-SMP finding in the CISBO market in the CLA (notwithstanding that some service shares remain above dominance thresholds) as well as our finding that BT has SMP in the CISBO market outside it.

4.4 Assessment of market power in relevant markets

4.139 We now present our assessments of market power, including our SMP proposals, in the relevant wholesale markets identified in the UK outside the Hull Area (see paragraph 4.126 above) – the single product markets for CISBO services in the CLA, the LP and the RoUK.

4.140 Annex 13 presents our approach to SMP assessment, outlining the criteria considered and summarising our general assessment of these criteria when applied to wholesale leased lines markets. We have followed this approach in our market power assessments and refer to Annex 13 for a more detailed description.

4.4.1 Market power assessment in the Central London Area (CLA)

4.141 We find that no CP has SMP in the market for CISBO services in the CLA as identified in paragraph 4.126.1 above.

4.142 This view is based primarily on our examination of the significant presence and density of rival infrastructure in the CLA. Table 4.4 (above) presents a range of metrics – including average network reach and depth of rival infrastructure at differing buffer distances (100m, 200m). Jointly, these measures provide a comprehensive characterisation of the presence and density of rival infrastructure in the CLA, and its impact on competition

- As can be observed in Table 4.4, virtually all businesses in the CLA have at least five OCPs within 200m (98%), and at least four OCPs within 100m (93%). The presence of rival infrastructure to this degree, in our view, as explained in section 4.1 above and in paragraphs A15.155 and further in Annex 15, ensures that the vast majority of (potential) users of CISBO in the CLA are likely to have competitive alternatives available to them in the event that BT raised its prices or otherwise offered poor terms of supply.

- Our analysis shows that supplier choice in the CLA is a degree of magnitude greater than supplier choice in any other part of the UK, including the postcode sectors in the LP that are located adjacent to the CLA.[119]

4.143 Given the significant presence of rival infrastructure in the CLA there is adequate scope for OCPs to use their existing infrastructure to compete for supply of CISBO services at any bandwidth. Whilst entry in the CLA still requires significant costs to be sunk and economies of scale and scope exist as elsewhere, the number and

[119] Outside the CLA, there will be some businesses which do have a wide choice of supplier, but also a material number of businesses with no or too limited choice to benefit from competition.

density of businesses and users of CISBO services in the CLA means these are of much reduced significance for competition, and in practice have not proved to be a barrier to entry. Accordingly, whether or not further entry is likely, is not an important consideration for our proposal that BT does not have SMP. While OCPs with existing infrastructure would face some costs when extending their networks to connect with new customer sites, the close proximity of their infrastructure to most (potential) users of CISBO services suggests that these barriers are unlikely to be high.

4.144 Table 4.4 (above) presents a break-down of the distribution of service shares in the supply of CISBO (and CISBO segments) for the four geographic areas identified (including the CLA).

4.145 We recognise that, despite the presence of dense rival infrastructure supporting effective competition across the CISBO range, BT's share in CISBO remains at a level – an estimated 44% by volume – exceeding the 40% level above which, according to the SMP Guidelines, single firm dominance concerns normally arise.[120] BT's share of estimated revenues is 37%.

4.146 To understand the reasons why BT has retained a share at this level, it is useful to consider how its share varies across CISBO segments. As noted above, BT's pricing policy has encouraged entry to occur first at the higher bandwidth segments of 1Gbit/s and above, very high CISBO, in particular. Consequently, the distribution of service shares in the CLA differs across bandwidth segments:

- In very high CISBO (i.e. services capable of providing bandwidth of more than 1Gbit/s), BT has a very low share of 8-11%, two OCPs have a share greater than BT and 4 OCPs have gained a share that exceeds 5%.

- In high CISBO (standard Ethernet services of more than 100Mbit/s and up to and including 1Gbit/s), BT's share is higher at 34% but still below conventional SMP thresholds and lower than BT's share in CISBO overall. In addition, we observe that the shares of OCPs show that a number of OCPs have managed to gain a significant share of the supply of these services.

- In low and medium CISBO (i.e. standard Ethernet services of up to and including 100Mbit/s), BT maintains materially greater shares, 41% for low CISBO and 55% for medium CISBO. If there were to be any concerns about lack of competition in the CLA, they would therefore be most likely to arise in low and medium CISBO. Below, we consider the competitive constraints (in particular, those arising from the presence and density of rival infrastructure) which protect users of these services from any attempt by BT to exercise market power.

- CPs other than BT noted in their submissions to the Market Questionnaire that in the centre of London they are able to use their own network infrastructure to a considerably greater extent to provide services without relying on wholesale services purchased from other CPs compared to any other part of the UK.[121]

- At the lowest bandwidths (relevant for CISBO services of up to 30Mbit/s), LLU operators are able to supply EFM services (with prices for EFM services currently significantly lower than prices of standard Ethernet services) to any site in the exchange area where they are present. Most (but not all) of the CLA is

[120] The SMP Guidelines.
[121] Based on confidential CP submissions to the Market Questionnaire.

part of exchange areas that were identified as competitive in the 2014 WBA Market Review Statement. Hence, we can expect most businesses in the CLA to have access to EFM services at competitive terms.[122]

- Further, asymmetric broadband (NGA) with bandwidths up to 100Mbit/s is increasingly becoming available throughout the UK. As explained in Annex 9, while we do not consider asymmetric broadband to be part of the market for CISBO services, we take account of the additional competitive constraints imposed by asymmetric broadband on supply of CISBO services of up to 100Mbit/s as an external constraint. Whilst we do not regard this constraint as strong by itself, when combined with constraints from within the market, it provides some additional support for our view that no CP has SMP.

4.147 Given the presence and density of rival infrastructure in the CLA, we consider that BT's continued high share is not sufficient to conclude that BT has SMP.

4.148 We also considered BT's pricing and profitability of its provision of CISBO services. The evidence on pricing and profitability is mixed. On the one hand:

- BT's pricing of AISBO services is currently subject to a safeguard cap and, at present, BT does not price up to the maximum permitted by that cap. The fact that BT could have set higher prices might give an indication that BT faces competitive constraints that prevented it from raising prices further.

- [✂

✂]

On the other hand

- BT has chosen not to vary its AISBO prices by geographic areas. This might point to competitive conditions being rather homogeneous across the UK. However, we note that other factors, in particular the effect of regulation which restricts BT's ability to offer some types of discount and requires it to publish prices, may affect BT's choice to maintain uniform prices.

- In Annex 22, we show that the profitability of BT's provision of AISBO services in the WECLA (as measured by BT's return on capital employed, ROCE) exceeded BT's cost of capital in each of the financial years considered, 2012/13 and 2013/14. This profitability evidence is consistent with BT continuing to have market power in the CLA.

4.149 Overall we think the evidence on pricing and profitability is consistent with a finding of SMP. However, as discussed above and below, other indicators point to a no-SMP finding.

4.150 As regards other structural indicators of competition, we note that number of and density of (potential) users of CISBO services in the CLA is very high, and much greater than in other geographic areas.

[122] Ofcom, 'Review of wholesale broadband access markets', Final Statement, 2014.

- Business density in the CLA is more than seven times greater than in any other geographic area suggesting that potential for using the same network infrastructure to serve a greater number of customers is significantly greater. OCPs, in particular, can benefit from more efficient utilisation of their network as a result

- Demand for CISBO services, and very high CISBO services in particular, is significant in the CLA. Even though the CLA is a very small area, it contains almost 20% of very high CISBO services and slightly more than 10% of all CISBO services in the UK outside Hull. We also note that the CLA contains a concentration of financial sector and media businesses, which are known to have very significant demand for connectivity services and bandwidth.

4.151 We would expect these structural features of competition in the CLA to continue to support OCPs' ability to compete for provision of CISBO services in the CLA.

Market power determination for the Central London Area

4.152 As discussed above, there is varying evidence on BT's position in the market for CISBO services in the CLA. On the one hand BT's service shares are at levels consistent with a SMP finding, as are prices and profitability, especially at the lower bandwidths. On the other hand, the very extensive rival infrastructure present in the area points to the likelihood of BT facing effective competition from numerous OCPs for provision of CISBO services to most/all services if supply of CISBO in the CLA were to be deregulated.

4.153 Overall, and on balance, we think it right to place more weight on the evidence on rival infrastructure and the extent to which this supports competition for CISBO services at all bandwidths, since this goes to the fundamental prospects for sustainable competition. It is largely on the basis of the evidence of rival infrastructure that we propose that BT does not have SMP in the market for CISBO services in the CLA.

4.4.2 Market power assessment in the London Periphery (LP)

4.154 We find BT to have SMP in the market for CISBO services in the London Periphery, and we expect BT to maintain its strong position in this market over the course of the review period.

4.155 We noted above that Annex 13 outlines our approach to SMP assessment, and describes how we assess and consider each of the SMP criteria identified as relevant to market power assessments in wholesale leased lines markets. If we apply the SMP criteria identified in Annex 13 explicitly to the LP, we conclude that BT derives a competitive advantage from control of its ubiquitous network, and from its ability to exploit economies of scope and scale to a greater extent than OCPs. This competitive advantage – reflecting the fundamentals of BT's strong position on the basis of its much more extensive network – underpins our assessment that BT has SMP in this market.

4.156 We do not consider that OCPs, constrained by the more limited coverage and density of infrastructure, will be sufficiently able to overcome the BT advantage in the period covered by the review to the extent required for effective competition across the CISBO range to become sustainable.

4.157 As in the CLA, the evidence on distribution of service shares is consistent with BT having SMP, with BT's share in CISBO equal to 48% by volume and 41% by estimated revenue. However, unlike the CLA, rival infrastructure in the LP is not sufficiently dense and the number of rival networks not sufficiently numerous to conclude that BT would likely face sufficient competitive constraints for it not to be able to exercise market power if regulation were to be lifted.

4.158 We note at this point the basis of the Boundary Test used to define the CLA area. The set of criteria was necessary for us to be sufficiently confident that all businesses in the CLA were adequately protected by competition, notwithstanding the evidence on service shares, prices and profits for BT in the CLA. We examined a number of possible alternative criteria (involving weaker criteria) but found a large measure of consistency surrounding the location of the CLA boundary. Annex 15 presents our analysis when applying alternative sets of criteria. In the light of this, we do not consider that the presence and density of rival infrastructure found in the LP is sufficient to ensure effective competition across the CISBO range.

4.159 The presence and density of rival infrastructure in postcode sectors in the LP is significantly lower than that in the CLA. Table 4.4 (above) presents a range of metrics characterising the presence and density of rival infrastructure in the LP. Our key observations are:

- The average network reach value for a buffer distance of 200m is significantly lower in the London Periphery: 4.1 in the LP versus 8.0 in the CLA.

- The difference in average network reach values becomes more marked for a buffer distance of 100m – 2.4 in the LP versus 6.2 in the CLA – providing an indication of the depth of rival infrastructure being significantly lower in the LP. The lower depth of rival infrastructure has implications for supplier choice at the level of individual businesses as:

  - Only 22% of businesses are located within 100m of four or more OCPs, and only 37% of businesses are within 200m of five OCPs. This also points to material proportions of businesses having limited supplier choice.

  - A third of businesses will only have one OCP within 100m, compared to 1% in the CLA. As CPs may not be willing to dig 100m to connect a customer in all cases, there is a very good chance that at least some businesses in the LP will not be adequately protected by competition. Users who need a resilient service may have no option than BT.

4.160 Table 4.4 (above) presents a breakdown of the distribution of service shares in the supply of CISBO in the LP. We observe that:

- BT's share of 48% by volume and 41% by estimated revenue in the supply of CISBO exceed the level of 40% noted in the SMP Guidelines as the level above which single firm dominance concerns normally arise;

- Supply of CISBO services is highly concentrated (as evidenced by HHI of 3,100).

- BT maintains a high share in each of the lower bandwidth CISBO segments (Ethernet services of up to and including 1Gbit/s): varying from 44% in both low and high CISBO to 57% in medium CISBO.

- BT's share of very high CISBO appears to be lower at 14-15%. We noted above that volumes of very high CISBO are very limited (only 796 circuits), and that small volumes and other limitations reduce the reliability and usefulness of shares in this segment as evidence. We refer to section 4.3.5 above for a discussion on limitations of service shares in relation to very high CISBO.

4.161 We also considered evidence on BT pricing and profitability. As in the CLA, the evidence is mixed.

- [✂

✂]

- As regards BT's pricing of other CISBO (formerly AISBO) services in the LP, we note that:
  - BT's pricing of other CISBO (formerly AISBO) services in the WECLA is currently subject to a safeguard cap and, at present, BT does not price up to the maximum permitted by that cap. The fact that BT could have set higher prices might give an indication that it faces competitive constraints that prevented BT from raising prices further.
  - Apart from the discounts offered on very high bandwidth CISBO, BT has (generally) chosen not to vary its CISBO prices by geographic areas. More particularly, BT has set same prices inside and outside the WECLA. While this could point to competitive conditions being rather homogeneous across geographic areas, we note that presence of SMP regulation might have affected BT's incentives to give discounts.
  - There is one exception to BT pricing uniformly. In the period May 2013 to end of March 2014, BT, only in the WECLA, reduced connection charges to zero for its EAD 1Gbit/s services. This could reflect competitive forces.
- Finally and again as in the CLA, Annex 22 presents our analysis of the profitability of BT's provision of AISBO services in the WECLA. We show in Annex 22 that in the financial years 2012/13 and 2013/14 BT's return on capital employed (ROCE) significantly exceeded BT's cost of capital.

4.162 Overall the evidence on pricing and profitability supports an SMP finding. Whilst the evidence we have on pricing and profitability is in many respects similar to that in the CLA, other factors in the LP, especially the much more limited extent of competing infrastructure, also point to an SMP finding, whereas in the CLA these factors provide evidence that BT does not have SMP.

4.163 It seems likely that the particular factors which have led to so much infrastructure investment in the CLA are present to a much lower degree in the LP. We note that:

- Business density (and leased lines density) is more than seven times lower in the LP compared to the CLA: 232 businesses per square kilometre in the LP versus 1767 in the CLA.

- In addition, we note that the CLA contains London's core financial districts, with businesses in this sector known for their very high demand for connectivity services and bandwidths.

Market power determination in the London Periphery

4.164 On the basis of the analysis set out above we consider that BT has SMP in the market for CISBO services in the London Periphery. The evidence on service shares, pricing and profitability points to SMP, and (in contrast to the CLA) we do not consider that the presence and density of rival infrastructure or customer concentration is sufficient to support effective competition if it were deregulated.

4.4.3 Market power assessment for the CBDs

4.165 While we do not formally propose to define a separate geographic market for CBDs, we do recognise, as noted in paragraph 4.125 above, that competitive conditions in CBDs are different from the RoUK market identified. For this reason and for completeness we explain here why we would find BT to have SMP even if we had defined a separate geographic market.

4.166 The reasons are broadly similar to those which apply in the LP:

- If we apply the SMP criteria, noted and explained in Annex 13, to competition for CISBO services in the CBDs, we find that BT has a significant competitive advantage in comparison to OCPs because of its more extensive network, scale and scope.

- BT's share in CISBO – 47% by volume, and 44% by estimated revenue – provides an indication of BT having SMP in the supply of CISBO services.

- As far as we are aware, BT has not offered discounts in the CBDs and prices are the same as in other parts of the RoUK. We note that evidence on pricing and profitability relevant to RoUK (as discussed in paragraphs 4.172 to 4.173 below) is consistent with BT having SMP.

- There is insufficient rival infrastructure to provide for effective competition. As Table 4.5 shows, measures of network reach are broadly similar to the LP. Average network reach tends to be a little higher, whilst the "depth of network reach" is somewhat lower.

4.167 We also reiterate that while there are broad similarities between the CBDs and the LP in terms of presence of rival infrastructure and distribution of service shares, there are reasons to expect that competition is less likely to be as strong in the CBDs than in the LP. We note in this regard (a) the LP's stronger economic and physical links with the CLA; and (b) the greater number of businesses located in, and CISBO services supplied to businesses in, the LP as compared to each of the individual CBDs.

4.4.4 Market power assessment in the Rest of the UK

4.168 We find BT to have SMP in the market for CISBO services in the Rest of the UK (RoUK), and we expect BT to maintain its strong position in this market over the course of the review period. As explained in paragraph 4.125 above, we consider that CBDs are to be included in the RoUK.

4.169 Annex 13 presents our approach to assessment of SMP criteria, and explains how we assess each of the SMP criteria considered in our market power assessments. It also emphasises that market power determinations are to be based on a cumulative assessment of SMP criteria, taking evidence in the round. If we apply these SMP criteria explicitly to the RoUK, we conclude that BT maintains a significant competitive advantage vis-à-vis OCPs:

- Its ubiquitous network allows BT to (typically) supply new customer sites at lower incremental costs as its connections and proximity to these sites imply that BT requires less material network extension.

- Its operations in a wider range of fixed telecommunications markets and the greater scale of its leased lines operations imply that BT has an enhanced ability to benefit from economies of scale and scope reducing unit costs.

- The high costs of network extension required for providing CISBO services to new customer sites give rise to barriers to entry/expansion, discouraging OCPs from competing, and thereby protecting BT's strong position.

4.170 Table 4.4 (above) presents the distribution of service shares in CISBO in the RoUK. We observe that:

- BT has a very high share in CISBO, 56%, in the RoUK. As noted in the SMP Guidelines, "market shares of more than 50% are in themselves evidence of a dominant position, save exceptional circumstances." BT's very high share is thus consistent with a *prima facie* presumption of SMP.

- Supply of CISBO in RoUK is highly concentrated, with a HHI equal to 4,154, providing an additional indication of supply for CISBO services in RoUK being characterised by a lack of effective competition. We also note that Virgin Media is the only rival supplier with a material share in CISBO, and that no other OCP has managed to attain a share greater than 5%.

4.171 As shown in Table 4.4 above, the presence and density of rival infrastructure in the RoUK is limited and significantly lower than in the CLA and the LP:

- Average network reach values are low: 1.2 for a buffer distance of 200m, and 0.8 for a buffer distance of 100m, more than three times lower than the network reach values in the LP.

- As shown under depth of rival infrastructure in Table 4.4 above, most businesses in the RoUK have limited supplier choice, and a significant proportion of businesses has BT as the only supplier.

  - For a buffer distance of 200m, we find that only 12% of businesses have a choice of three or more OCPs, that most businesses, 70%, have a supplier choice of at most one rival supplier to BT [✂ ✂], and that 29% of businesses have only BT as a potential supplier.

  - For a buffer distance of 100m – a distance where we consider OCPs to be more likely to extend their network with to provide the range of CISBO services to new customer sites (as informed by our analysis of dig data in Annex 18) – the supplier choice available to businesses is even further reduced – only 5% of businesses have a supplier choice of three or more rival

suppliers to BT, 85% have a supplier choice of at most one rival supplier to BT, and 39% have only BT as a potential supplier.

4.172 We consider that the presence of rival infrastructure to the extent observed in RoUK does not support effective competition and is unlikely to sustain the development of effective competition for CISBO services over the course of the review period.

4.173 In summary, we consider that the combination of BT deriving a competitive advantage from its network, BT's very high share, the high degree of concentration, and the limited presence of rival infrastructure is consistent with a finding of SMP in this market.

4.174 We also considered evidence on BT (and to some extent OCP) pricing and BT's profitability of providing CISBO services in the UK outside the WECLA:

- The pricing of BT's low, medium and high CISBO services in the UK outside the WECLA has been subject to charge control over the past years.

- BT has sold very high CISBO products in the UK outside the WECLA (which covers the same area as the CLA and the LP together) at list prices, it has not offered discounts as in the WECLA. As the discounted prices in the CLA in particular are evidence of targeted price reductions intended to meet local competition, we consider the fact that prices remain higher outside the CLA and LP are consistent with BT having SMP in the RoUK.

- Our profitability analysis, presented in Annex 22, shows that the return on capital employed (ROCE) of BT's provision of CISBO services in the UK outside the WECLA exceeded the cost of capital in the two financial years considered, 2012/13 and 2013/14, significantly more so in the most recent financial year 2013/14. The high profitability observed is consistent with a market power finding.

4.175 Overall the evidence on pricing and profitability supports an SMP finding.

Market power determination in the Rest of the UK

4.176 Overall, we consider that BT has SMP in the market for CISBO services in the Rest of the UK. All of the indicators we considered (the limited presence of rival infrastructure, in particular) point to this finding, and indicate that BT will retain a strong position over the period of the review.

4.5 Leased lines as inputs to other markets

4.177 Leased lines are used to support other markets, in particular, mobile telephony and broadband markets and retail fixed broadband internet access markets. Leased lines are used to provide backhaul from mobile base stations and LLU ("local loop unbundling") backhaul from unbundled BT exchanges. In addition, there are a range of 'niche applications' for leased lines such as CCTV, broadcast and Street Access services. We have considered these uses and applications. In the following paragraphs we summarise our proposals to include mobile and LLU backhaul within the combined market, but not to include the niche applications. Our analysis is set out in full in Annexes 11 (mobile backhaul) and 12 (LLU backhaul), respectively.

4.5.1 Mobile backhaul

4.178 Mobile networks consist of around 50,000 cell sites, within excess of 40,000 of these connected by physical copper or fibre links from those cell sites back to their core networks. With national coverage targets, the location of cell sites can also be in more rural and difficult to serve areas. In Annex 11, we set out our view that, on demand and supply-side substitution grounds, there is no strong case for a MNO backhaul market, separate to the TISBO and CISBO markets we define. In addition, and in any case, the evidence strongly supports the inclusion in a single market of mobile backhaul services supplied using both Ethernet and WDM technologies. This is because MNOs are primarily concerned with meeting their bandwidth requirements and, at the present time, do not need specialist interfaces.

4.179 We note that, in the absence of regulation, price discrimination on the basis of use is likely to be possible because the CP may be able to prevent demand-side substitution between MNO backhaul and the technically equivalent CISBO or TISBO service. That is, a supplier might be able to charge different prices for a circuit used for MNO backhaul and a similar circuit used to supply a leased line to a business customer. Therefore we have also considered whether competitive conditions differ between MNO backhaul and leased lines used by business customers. We note that BT's share of MNO backhaul is higher than its share of other CISBO circuit volumes. This may reflect a need for operators to have coverage over a wider number of sites, including some in remote areas, in order to supply MNOs. BT therefore has a very strong position in the supply of MNO backhaul across all market segments. However, given our proposed definition of the CISBO market in which BT has SMP everywhere outside the CLA, we consider competitive conditions to be sufficiently homogenous that it is not necessary for us to identify a separate market for MNO backhaul. Within the CLA, we find there to be sufficient depth of rival network close to mobile cell sites for MNO backhaul to be competitive, as with other CISBO services.

4.180 Our proposal is therefore to include MNO backhaul services within the relevant TISBO and CISBO markets. Our SMP proposals therefore cover the provision of MNO backhaul services.

4.5.2 LLU backhaul

4.181 LLU backhaul is purchased by some of the main providers of asymmetric broadband services such as Sky and TalkTalk Group. LLU backhaul is technically similar to a standard CISBO circuit, but has one end typically at a BT local exchange for

connection to regulated wholesale local access services (unbundled local copper loops or access fibre).[123]

4.182 In Annex 12, we note that BT's position in LLU backhaul appears somewhat stronger than in CISBO generally. If competitive conditions were sufficiently different, it could be appropriate to define a separate market. The requirement for a large number of backhaul circuits from BT exchanges over a wide footprint gives BT a significant advantage, particularly since one end of the circuit is always at a BT exchange. This is reflected in higher BT shares than seen in supply of CISBO services that use lines for access requirements. However, as with MNO backhaul, it is not necessary to identify a separate relevant market given our market definition and SMP proposals. We would reach the same view in a separate LLU backhaul market. Within the CLA, we find there to be sufficient depth of rival network close to BT exchanges for the supply of LLU backhaul to be competitive, as with other CISBO services.

4.183 Our proposal is therefore to include LLU backhaul within the relevant CISBO market. Our SMP proposals therefore cover the provision of LLU backhaul services.

4.6 Identifying the boundary between terminating segments and core/trunk networks

4.184 Most infrastructure providers in the UK have high capacity core infrastructure allowing them to provide connectivity between major urban locations and network hubs. We refer to these high capacity connections as "core conveyance" or "trunk" services.[124][125] Since most CPs have their own core network infrastructure, BT does not have market power in relation to them. These core network links are distinguished from terminating segments, which are the links from customer sites to the core networks.[126] In this section we provide our assessment of how we have drawn the boundary between core networks (which are competitive) and terminating segments (which are often not competitive).

4.185 As set out in the EC Recommendation, these core or trunk segments are deemed to be competitive and not susceptible to *ex-ante* regulation:

> "…[a] clear distinction between the terminating and trunk segment is important as the market for wholesale trunk segments of leased lines has been removed from the list of markets susceptible to ex ante regulation in the 2007 Recommendation. Nowadays, almost all Member States have deregulated this wholesale market for trunk segments. Therefore the presumption that trunk segments are replicable on a national scale remains valid. Consequently, NRAs should not revisit their analysis of trunk segments of leased lines."

4.186 In principle, the EC Recommendation suggests that NRAs should not revisit their analysis of core networks. However, there are reasons to believe that the competitive core part of the network has expanded since the BCMR 2013. As set out in our

[123] For example, TTG have unbundled over 3,000 BT exchanges. https://www.samknows.com/broadband/llu/cpw

[124] The term "core conveyance" refers to the core network for CI services, while "trunk" refers to the trunk network for TI services.

[125] See Annex 19 for a discussion of TI trunk services.

[126] Terminating segments may comprise the direct links from the customer premises to an aggregation point and also the backhaul from the aggregation point to a CPs core network.

market context section we have seen the emergence of data centres that are used by CPs as network hubs, that is, as points on their core networks where switches are located and interconnection with other operators can take place. BT has also submitted that CPs generally interconnect with it deeper (closer to the end user) in its network than at the time of the 2013 BCMR AI core market definition. We have therefore considered whether, in UK circumstances, we should widen the scope of the competitive CI core market in light of market developments. Our full assessment is set out in Annex 20.

4.187 Below we provide a summary of our CI core analysis. First, we recap our 2013 BCMR market definition. We then summarise the key analytical steps and preliminary findings for this consultation.

4.6.1 Market analysis in 2013 BCMR Statement

4.188 In the 2013 BCMR Statement, we identified the boundary between trunk and terminating segment markets as occurring at Trunk Aggregation Nodes (TANs). TANs are groups of BT switch sites (nodes), located close together, where terminating segments are aggregated for connection to the core or trunk network. Circuits sold between major BT nodes that belonged to different TANs, were classified as part of the competitive AI (now CI) core. Other AI (CI) circuits, including those between BT exchanges within the same TAN were classified as terminating segments.

4.189 Each TAN was composed of a number of BT's main network nodes known as Openreach Handover Points (OHPs). The Openreach 'owned' fibre access network used to provide CISBO services is connected to BT's core network at 106 OHPs typically in the main urban centres. In the BCMR 2013, we observed that, in large urban centres (like London, Birmingham, Glasgow), BT has multiple major nodes. Other large CPs also have a core of trunk routes between major urban centres (but to a lesser extent than BT). These CPs often interconnect with BT at at least one major exchange (and sometimes more than one exchange) in each major urban centre. However, we observed that CPs would not always find it economic to interconnect at each and every one of BT's 106 OHPs.[127] We therefore grouped some (but not all) of BT's 106 OHPs into TANs. We identified 56 for the AISBO market in the BCMR 2009.[128]

4.6.2 Key criteria to identify candidate competitive exchanges

4.190 In response to the CFI (and as in the last review) BT argued that our analysis of competition for core networks should take into account CP presence at other BT exchanges, not only its OHPs. Specifically, BT proposed that we define the boundary between terminating segments and the competitive core network as occurring at any exchange at which two or more CPs other than BT were present. BT asserted that this would be sufficient to ensure that core conveyance from that exchange would be competitive.

[127] For example, in Birmingham area there were several BT nodes close to each other. Based on the volume of traffic served in the Birmingham area and the close proximity of those nodes we grouped these nodes into the "Birmingham TAN". This was based on the notion that a reasonably sized CP would choose to interconnect with BT at at least one OHP, but not necessarily all.

[128] For London, we identified more than one TAN reflecting the greater volume of traffic in the capital. Hence, even if some OHPs were relatively close to each other, it would be likely that a reasonably sized CP would interconnect in more than one location in the capital.

4.191 BT suggested that we could identify the number of operators present at an exchange by counting the number of CPs purchasing interconnect products from BT there. The logic is that if a CP is purchasing an interconnection product from BT at a particular exchange then it must be handing a BT terminating segment over to its own network (or that of a third party).

4.192 For Ethernet services, BT has provided data on two interconnect products:

- **external cable links:** these are fibre connections that run from equipment at the exchange end of a terminating segment to a chamber outside of the BT exchange building;

- **bulk transport link**: this service is used to handover multiple wavelengths on a single link.

4.193 Using BT data, we found that there were 1,320 BT exchanges with at least one CP purchasing interconnection products and at 740 exchanges there are two or more CPs.

4.194 In conducting this analysis, we found a large number of CPs (33) purchasing external cable links. This list including major infrastructure players such as Vodafone and Virgin Media, but a number of smaller players such as Hyperoptic or seemingly location specific ones such as Lancaster University.[129]

4.195 There are two issues that arise from this. First, some of these operators do not have their own core infrastructure. Therefore the presence of an individual CP purchasing interconnect products does not necessarily equate to that CP imposing an additional competitive constraint on BT's core conveyance services from that location. For example, we know that [✂] is reliant on third party supply for a significant proportion of its network requirements. Therefore, the 'presence' of [✂] purchasing interconnection from BT at an exchange will very likely mean it will hand over traffic onto a third party providers network. Given this, interpreting [✂] interconnect purchases as evidence of core competition would overstate the strength of the competitive constraint imposed by that operator. In other words, although two CPs may purchase interconnection at BT's exchange, only one may actually have a core network, which is used by both the interconnected operators. Second, some of the very small, localised operators are clearly not credible competitors in the provision of core conveyance services. Even if they have their own infrastructure, the scope for them to provide national core/trunk solutions is limited.

4.196 We therefore propose to apply a second criterion which considers whether a CP actually has network within 200 metres of an exchange.[130] Possession of network nearby provides stronger evidence that the CP is purchasing interconnection to its

[129] The full list included: [✂

✂]

[130] We are using the 200m distance here for a different purpose than in our geographic market definition. Here we are using the distance as a means of determining where the purchase by a CP of an interconnection product at an exchange is to link the exchange to its own network. We consider other distances for OCP network to BT exchanges, but as discussed in Annex 20 the results are insensitive to the range of distances considered.

own network rather than to a third party CP's. We want to ensure that CP presence has a material and sustainable impact on competition for core before classifying an exchange as competitive.

4.197 Ideally, we would also consider estimates of BT's share of core conveyance from BT exchanges. This would provide evidence that operator presence is having a material impact on competition for core conveyance services from these exchanges. In practice, we cannot compute service shares in this way (see discussion in Annex 15) because CPs do not routinely collect the necessary data. In the absence of service share data, we propose the relatively conservative method of identifying competitive exchanges based on the two criteria described above and in Annex 20. We are seeking additional relevant evidence from CPs through this consultation.

4.6.3 Key criteria to *identify candidate data centres*

4.198 To identify data centres which are being used by CPs as part of competitive core networks, we began with an initial list of 354 UK data centre locations. These came from a variety of sources, including stakeholder responses to the CFI and our requests for information on major network node locations. We also inspected the websites of the data centres in question and used other publicly available information.[131]

4.199 For each data centre we recorded details such as its postcode, name and parent company and whether the site describes itself as "carrier neutral". We then narrowed down the list based on whether the data centre is carrier neutral as well as indicators of competition differences.

4.200 We have only included data centres that advertise themselves as carrier neutral because these locations would permit interconnection between multiple CPs. In contrast, a non-carrier neutral data centre may permit interconnection only on to the network of the CP that owns the data centre.

4.201 The next step was to establish the number of operators present at each data centre and able to compete to provide core conveyance from it. This was achieved by matching data centre postcodes to circuit location information provided by CPs.

4.202 Our analysis also identifies circuits between data centres to identify those data centres that could be functioning as (competitive) core nodes. We expect such a site to have connections to multiple other data centres and core switch sites. We identify data centres as competitive nodes where there are multiple connections between those data centres and others and there are sufficient CPs on those routes for provision of core conveyance to be competitive.[7]

4.203 Limitations with the available data again prevent us from computing 'CI core segment service' shares at data centres. We are however able to compute BT's share of all CISBO circuits at a given data centre.

4.204 Our prior view is that a BT share of circuits below typical dominance thresholds will support classification of a data centre as a competitive core node. We infer that BT's share of core segments at a data centre is likely to be lower than its share of all segments at that data centre. However, we put most weight on the number of

[131] www.datacentermap.com

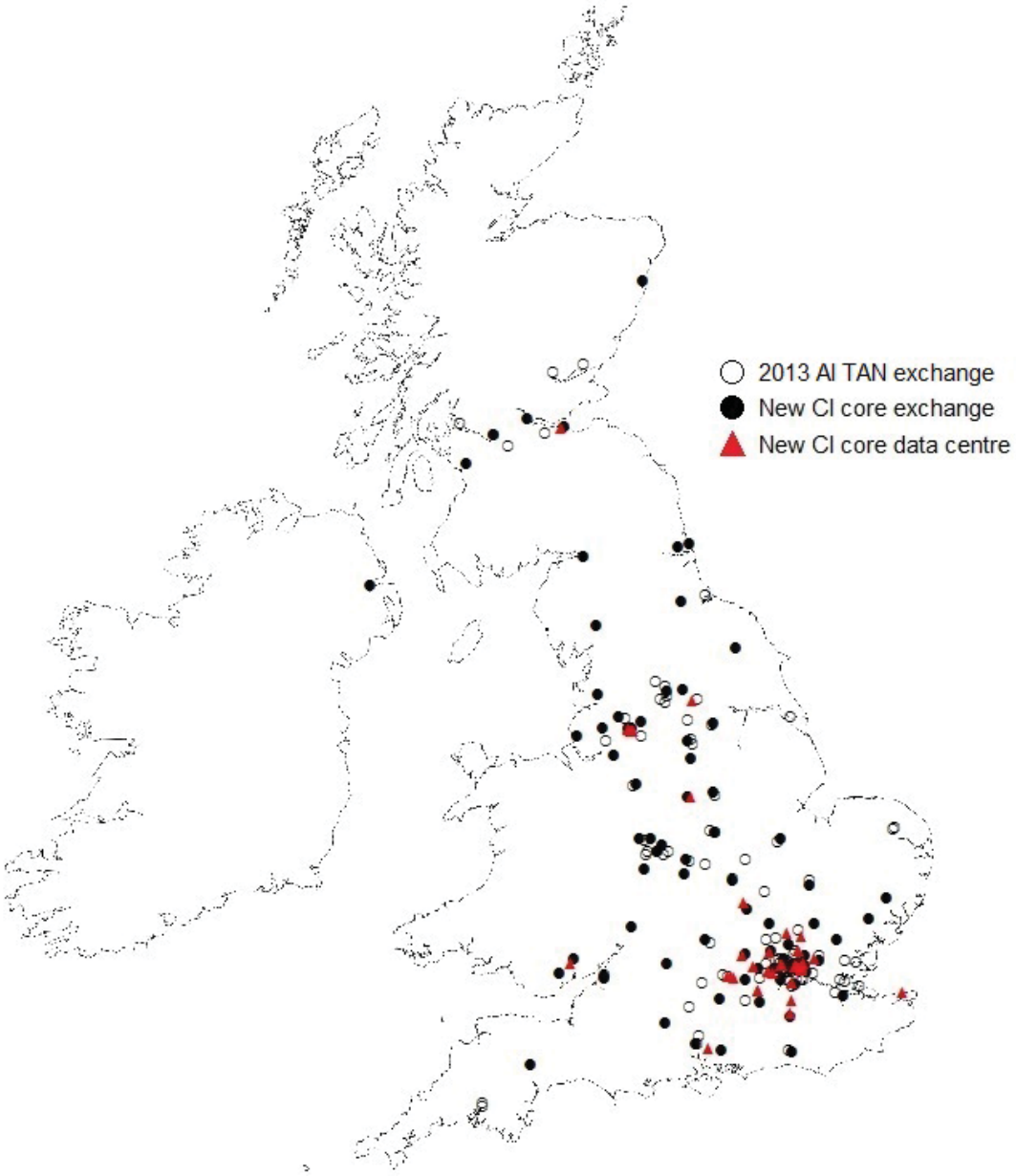
operators present at a data centre and evidence that it is part of competing CPs' core networks.

4.6.4 Summary of proposals

4.205 Based on the application of the above criteria, in addition to existing TAN exchanges, we identify 96 new Candidate Competitive Exchanges (CCEs), 17 of which are in the London area (CLA or LP). We propose 60 candidate competitive data centres, 30 of which are in the London area (CLA or LP). The locations of these candidate core nodes are shown alongside existing CI core locations in Figure 4.5 below.

4.206 In conclusion, we propose that links between the candidate nodes would form part of the competitive CI core market and, hence, would fall outside the CISBO market. No CP would be found to have SMP in the relevant CI core market.

Figure 4.5: Provisional analysis of additional candidate nodes



4.207 The full list of data centres and additional candidate nodes is provided in Annex 20. We note however that this initial list of locations does not provide our final view on the potential scope of core networks as there are some limitations on the data available to us. In particular, in light of data issues, we have inferred CPs' presence in CI core markets on the basis of the proximity of their networks to BT exchanges at which they purchase interconnection products, and therefore we cannot be certain that reliance on BT for terminating segments does not also extend to these circuits.

4.208 Therefore, shortly after publishing this consultation, we will ask each CP to review the information we have compiled on their presence at BT exchanges and data centres. This is with a view to understanding their capability to self-supply core conveyance and/or provide core connectivity to third parties.

4.209 However, in light of the available evidence on CP interconnection and infrastructure presence, we consider that there is scope for widening the boundary of the CI core market. Therefore, in the absence of further data or evidence showing that our inferences about CP presence were wrong, we would be minded to add the identified datacentres and candidate exchanges as core nodes.

4.210 BT would not be required to provide any circuits between TANs whether these are BT exchanges or data centres.

4.6.5 Mapping of additional candidate nodes to existing TAN locations

4.211 A specific issue related to the identification of additional candidate nodes is whether we treat circuits between nodes in close proximity as core segments. For example, although not observable in Figure 4.5, our analysis has identified two candidate competitive nodes in Plymouth which are only 3km apart. Consistent with our existing TAN approach, we would group together these exchanges to form a single Plymouth TAN. This would mean that BT would still be required to provide circuits between the two Plymouth locations but not to other core nodes.

4.212 We consider in Annex 20 whether to define each new location as a core node in its own right or to group nodes in close proximity together, including with existing TANs. In Annex 20, we consider this issue in more detail and propose to group some of the candidate exchanges in close proximity either together or to existing TANs. This is consistent with the original rationale for TANs and avoids causing CPs to incur additional costs of rearranging points of interconnection. Our analysis results in an additional 18 TANs (alongside the existing 56 TANs) taking the total to 74 TANs.

4.213 As this rule reflects CPs' specific needs for interconnection with BT at BT exchanges, we do not apply it to data centres but propose to treat them all as new TANS.

Consultation questions

Question 4.1: Do you agree with our approach to wholesale product market definition and our proposed wholesale product market definitions in relation to services provided using contemporary interfaces? In particular, do you agree with our proposal to define a single product market for Contemporary Interface Symmetric Broadband Origination (CISBO) services? If not, what alternative would you propose and why?

Question 4.2: Do you agree with our assessment of competitive conditions for very high CISBO services? If not, what alternative would you propose and why?

Question 4.3: Do you agree with our approach to geographic market definition and our proposed geographic market definitions? In particular do you agree with our proposals to define the Central London Area (CLA) and the London Periphery (LP) as separate geographic markets? If not, what alternative would you propose and why?

Question 4.4: Do you agree with our approach to SMP assessment? In particular, do you agree with our proposals to find no CP to have SMP in the market for CISBO services in the Central London Area (CLA), and to find BT to have SMP in the markets for CISBO services in the London Periphery (LP) and the Rest of the UK (RoUK)? If not, what alternative would you propose and why?

Question 4.5: Do you agree with our approach to product and geographic market definition for wholesale CI core conveyance services and do you agree with our proposed market definitions for wholesale CI core? If not, what alternative would you propose and why?

Question 4.6: Do you consider that our list of candidate competitive exchange and data centre locations is correct?

Question 4.7: Do you agree with our assessment that connectivity between additional candidate nodes and data centres are competitive?

Section 5

Market assessment for legacy wholesale services

Introduction

5.1 This section sets out our product market definition proposals for legacy wholesale markets, and our market power determinations in the relevant market defined.

5.2 We propose the following product markets and SMP findings:

5.2.1 wholesale low bandwidth Traditional Interface Symmetric Broadband Origination (TISBO) services at bandwidths up to and including 8Mbit/s in the UK outside the Hull area, in which BT has SMP;

5.2.2 no markets defined for higher bandwidth TISBO on the basis that the three criteria test is not met;

5.2.3 wholesale national TI trunk segments at all bandwidths in the UK in which no operator has SMP.

5.3 This section is structured as follows. First, we summarise our approach to market definition. Then, following this approach, we assess the appropriate market definition for legacy wholesale services, by considering the following:

- The substitutability of analogue leased lines for digital leased lines which use time-division multiplexed technologies such as SDH and PDH. We find these to be sufficiently close substitutes to include them in the same market or markets, which we refer to as the traditional interface (TI) market or markets.
- The substitutability of these services for CI services sold to businesses. We conclude that these services are not part of the same markets as TI services.
- Whether we should identify separate markets for TI leased lines services of different bandwidths;
- The market boundary between (competitive) wholesale national trunk services and less competitive wholesale TISBO (terminating segments) markets. We consider whether to define separate markets for longer-distance “national” trunk services and for shorter-distance “regional” trunk services as in the BCMR 2013. In this review, we propose to include the latter services in the market for terminating segments.[132]
- Whether the market for low bandwidth TISBO is national in scope (in UK outside the Hull area) or whether it is appropriate to identify separate geographic markets.

[132] The regional trunk market included circuits at all bandwidths. As we explain in this section, we no longer propose to define markets for TISBO above 8Mbit/s and so only regional trunk circuits at 8Mbit/s and below will be treated as terminating segments.

5.4 Finally we present our SMP assessment and findings in light of our product and geographic market definitions.

Approach to market assessment for legacy services

5.5 In the 2013 BCMR we identified the following relevant wholesale legacy service markets in which we found BT to have SMP[133] and in which we imposed SMP conditions:

- Low bandwidth TISBO (up to and including 8Mbit/s);
- Medium bandwidth TISBO (above 8Mbit/s up to and including 45Mbit/s);
- High bandwidth TISBO (above 45Mbit/s up to and including 155Mbit/s); and
- TI regional trunk segments at all bandwidths.

5.6 Below we set out the review we have carried out of the decisions taken in the 2013 BCMR. As set out in Section 3, the TI market is now in decline and almost all new demand for leased lines services is met by more modern alternatives (e.g. Ethernet and WDM). As a legacy market, we do not expect significant new demand or competition within the TI segment. In this context, the focus of our market assessment is on existing supply and any potential competitive constraints that arise from potential substitution and migration to more modern alternatives.

5.7 Our approach to product market definition is set out in in Annex 8, but in summary we first consider substitution at the retail level to inform our wholesale market definition (since demand for wholesale legacy services is derived from downstream demand). [134] The product market definition is conducted in the absence of any other wholesale SMP regulation in leased lines markets[135] and on a forward looking basis.[136]

5.8 Separately to the wholesale assessment below, we are consulting on lifting retail regulation for very low bandwidth retail services (sub-2Mbit/s).[137] However, we note that in the BCMR we still need to define wholesale markets, and this definition is informed by an assessment of all retail markets including TI services at very low bandwidths (albeit in the absence of regulation).[138]

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[133] We note that we did not find BT to have SMP in medium and high TISBO markets in the WECLA in the 2013 BCMR.

[134] Where we find that retail services are in separate product markets, we consider that any competitive constraint at the wholesale level based on retail level substitution and derived demand would be similarly weak.

[135] This approach is referred to as the modified Greenfield approach. However, we take into account any *ex ante* wholesale regulation upstream that exists independently of a finding of SMP in business connectivity markets (e.g. LLU).

[136] Rather than just looking at the current position, our market review looks ahead to how competitive conditions may change in future. Therefore, our market definition needs to be sufficiently forward-looking to cover the three year timeframe of the market review.

[137] We are consulting separately because BT's plans to switch off the platform may impact providers of critical national infrastructure (such as electricity grid operators). http://stakeholders.ofcom.org.uk/consultations/very-low-bandwidth/

[138] This contrasts with our assessment of the retail very low bandwidth market, which assumes that there will be some upstream regulation of TI services. In the 2013 BCMR we deemed it necessary to

Substitutability between different types of interface

5.9 In this section we consider substitution between different interface types used to support leased lines. We start with legacy interfaces within the low bandwidth traditional interface market before considering whether the market should be defined more widely to include Ethernet or other technologies.

Retail leased lines assessment for legacy services

5.10 At low bandwidths, there are a range of legacy services used including:

- **analogue connections** commonly used for voice transmission e.g. external extension circuits between business sites. They are also used for low-bandwidth data transmission up to 56kbit/s; and

- **digital interface leased lines** based on legacy time division multiplexed technical transmission standards, including PDH and SDH. They feature stable and predictable transmission characteristics, such as low transmission delay (latency) and low jitter (variation in transmission delay). They are available in bandwidths ranging from 64kbit/s up to 622Mbit/s and beyond. The most popular variants are n x 64kbit/s (very low bandwidth) and 2Mbit/s (low bandwidths) connections.

5.11 As set out in Annex 10, we propose that analogue and low bandwidth SDH/PDH leased lines (including 2Mbit/s and sub-2Mbit/s services) are in the same 'low bandwidth traditional interface' market. This proposal is consistent with the views set out in the 2013 BCMR Statement.

5.12 No stakeholder responding to the April 2014 CFI has challenged our assessment that low bandwidth legacy leased lines should include analogue and SDH/PDH leased lines. Some stakeholders note however that there is potential for a wider market including Ethernet leased lines alongside TI services. This is also set out in the EC Recommendation, where it states that *"terminating segments of traditional interface leased lines, […] have been found substitutable to "carrier-grade" Ethernet services for all but the most demanding business applications."*[139] Therefore, we set out below in more detail our assessment of whether we should define a wider market that also includes Ethernet services or asymmetric broadband.

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continue to regulate retail very low bandwidth circuits. This followed at the "third stage" of our market assessment. In the first step, we examined retail markets in the absence of any upstream (wholesale regulation). In the second stage, we then identified relevant wholesale markets (in light of our retail market definitions) and identified a suite of *ex ante* remedies necessary for the low bandwidth TI terminating segments market. Finally, in the third stage, we revisited our retail market definitions in the presence of upstream wholesale regulation and found it necessary to regulate BT at the retail level. This Section only considers stages 1 and 2 of the market assessment framework and is not concerned with stage 3.

[139] Page 50 of Explanatory note to EC Recommendation

Migration to Ethernet or other services does not exert a sufficient constraint on Traditional Interface services to widen the market

Introduction

5.13 As noted in Section 3, the TI market is viewed as a legacy market in overall decline. With a few exceptions most new data connections are based around Ethernet or business broadband connections.

5.14 The decline in demand for TI services is related to three main drivers:

- BT has signalled to end-users that it is ending support for the platform that supports sub-2Mbit/s services due to obsolescence of the equipment;
- a large number of TI users are increasing their bandwidths above 10 Mbit/s or higher (where Ethernet is the cheaper technology); and
- the widespread availability of NGA broadband and Ethernet First Mile services to support higher upload and download speeds using Wholesale Local Access remedies (i.e. LLU and VULA).

5.15 Despite these general trends, significant numbers of customers are expected to remain on low bandwidth TI circuits over the review period, with some new connections still occurring.[140] Below, we consider the key issue in determining market boundaries for legacy products, which is whether the speed of migration to other technologies (e.g. Ethernet and NGA) is likely to be strongly affected by movements in relative prices. If migration is likely to take time and reflect considerations other than modest movements in relative prices, there is scope for BT to continue to exert market power in legacy services even if demand for those services is in long term decline.

5.16 In Section 4, we explain that we define a single market for CISBO services of all bandwidths because:

5.16.1 the same networks are used to supply CISBO services of all bandwidths. The intensity of competition then depends primarily on the number of such networks in a given area, and at this level is homogeneous across CISBO services;

5.16.2 on the demand-side, there is evidence that services of different bandwidths and interface types are linked by a chain of substitution as a result of users' ability to switch between them in response to price changes.

5.17 In this Section, following a consistent approach, we nevertheless propose to define a separate market for low bandwidth TISBO services. This is because:

5.17.1 low bandwidth TISBO services are low-value, legacy services for which demand is in long-term decline, and we consider that the incentives on OCPs to invest in order to increase their shares of the low bandwidth TISBO market are and will remain limited. Even in areas where OCPs have infrastructure which could be used to supply low bandwidth TISBO

[140] [✂

✂]

services, and allowing for the possibility that relative prices may change, we do not expect competitive conditions to change materially over time;[141] and

5.17.2 the evidence suggests that users do not view low bandwidth TISBO services and CISBO services as close substitutes, and so they are not linked by a chain of substitution.

5.18 In these circumstances, we propose to define a separate low bandwidth TISBO market, as in the BCMR 2013 and earlier reviews. In Annex 9 and below, we consider first substitution towards Ethernet (as the closest candidate substitute service) before turning to other technologies.

Ethernet and TI services:

5.19 Our key findings on demand-side substitution are set out below, as follows[142]:

5.19.1 Ethernet offers product characteristics that are similar to TI products for most users, but there remain other users that will be unwilling to switch:

- We consider that the qualitative differences between legacy TI products and Ethernet have eroded to such a degree that for many end-user requirements they are no longer important. This is reflected in the fact that carrier class Ethernet has largely become the ubiquitous standard for *new* business data connections. Thus, many businesses have now adopted Ethernet or alternative services in preference to TI services.[143]

- Nevertheless, there may still be barriers to some legacy users switching to Ethernet, in particular due to having to change end-user equipment (as discussed below). Furthermore, some legacy and some specialist applications will continue to require SDH/PDH leased lines as reflected in the EC Recommendation that identifies "demanding business applications" that may require TI services.[144]

- Increasingly, the consumers that remain on TI services are those with very specialised requirements that are least likely to move away. Accordingly, even if the majority of current TI users are expected to switch eventually to Ethernet, over time those users that place high weight on the particular characteristics of TI services, and are least-price sensitive, may become an increasingly large part of the remaining TI customer base.

5.19.2 Pricing and migration trends point to separate markets:

- TI remains the cheaper technology for users with low bandwidth needs (i.e. below 10Mbit/s). But apart from at the very lowest bandwidths, TI services are at a significant premium relative to CI. The price analysis is consistent with the patterns of demand for TI services where a significant base of low bandwidth TI

[141] The TISBO market is therefore unlike the CISBO market, where migration between services seems likely to be a force for convergence in competitive conditions over time.
[142] The evidence and reasoning to support these findings is set out in more detail in Annex 10.
[143] See Annex 10.
[144] We note in Annex 10 that market research is consistent with this view. We can also identify a particular class of customers running 'critical national infrastructure' that highly value reliable low latency connections.

services remains, whereas there have been significant declines in the installed base for TI high.[145]

- We have considered how end-users would react to an increase above the competitive price of TI services (i.e. a SSNIP). Given the already existing price differences, there is likely to be a limited response to a small price increase. This is supported by evidence we have considered on the sensitivity of demand for TI services over time to large changes in the relative prices of CI services as compared to TI.[146] This suggests that the rate of migration from TI to CI services is unlikely to be strongly influenced by movements in relative prices.[147]

5.19.3 Barriers to switching slow the rate of migration to alternatives:

- We identify the following barriers to switching from TI leased lines to Ethernet services including:
    - the potential for service disruption;
    - parallel operation whilst the new service is tested; and
    - changes required to Customer Premises equipment: for end-users with SDH/PDH interfaces switching to Ethernet may require a change of CPE. Examples include changes to PBX equipment used to provide private circuit switched voice services.[148]
- Where switching entails more than changes to network connectivity, end-users may take longer to change technology and may do so only as part of an IT refresh. There would be a likely delay to switching, up to the point where switching might only take place when the end-user equipment or applications come to the end of their product life cycle. Indeed, Openreach recognised this migration trend from legacy to Ethernet in its sales literature, where it stated "customers may consider Ethernet adoption as a viable alternative to legacy services like Time Division Multiplexing as part of a premises move, contract renewal or PBX change-out."[149]

NGA and EFM are not sufficiently close substitutes

5.20 As discussed in Sections 3 and 4, EFM is a variant of Ethernet leased lines that uses bonded copper in the access segment from an exchange. Asymmetric broadband services offer different upload and download speeds. But both EFM and NGA are now more than capable of supporting upload and download speeds equal to those of

[145] Further details of prices and volume trends are set out in Annex 10.
[146] Annex 10, Figure A10.1.
[147] The situation in the wholesale low bandwidth TISBO market can be contrasted with that in the retail very low bandwidth TI market where: users must migrate due to switch-off of the network used to provide very low bandwidth services; there has been a major campaign to raise awareness of alternatives; some users will switch to 2Mbit/s TI services supported at the wholesale level by low bandwidth TISBO services; the no-SMP finding at the retail level reflects the effect of continuing wholesale regulation, as well as migration opportunities.
[148] There is equipment available that allows PBX to IP conversion, but this would still entail an additional cost of moving from one technology to another.
[149] http://www.openreach.co.uk/orpg/home/products/ethernetservices/downloads/ethernet_portfolio_training_pack.pdf

low bandwidth TI services.[150] Nevertheless, we do not consider these services are sufficiently close substitutes for low bandwidth TI services.[151]

5.20.1 Aside from bandwidth, the product characteristics of EFM and NGA are viewed as inferior to TI services:

- Asymmetric broadband services are viewed as inferior in terms of SLAs/SLGs and latency and jitter performance.[152] Latency and jitter can vary and are dependent on the bandwidth capacity of the network and traffic at any given point in time. Therefore, asymmetric broadband services cannot often guarantee specified performance levels.

- Evidence from CPs also suggests that they are reluctant to support the same level of SLAs/SLGs for EFM as seen for leased lines more generally. We regard EFM services as part of the CISBO market but, in terms of its positioning, EFM is marketed as 'Ethernet-lite'[153], and we view it as less likely to be seen as a close substitute to a TI service in quality terms than other Ethernet leased lines.

5.20.2 Price and migration trends point to separate markets

- At lower bandwidths, EFM and Asymmetric Broadband are significantly cheaper than Ethernet services. Some of the users of TI low bandwidth services not needing significant bandwidth upgrades or leased lines characteristics may substitute to these cheaper services. However:

  - Our consumer survey shows that while there is some propensity for users to consider switching to NGA, the level of switching to NGA from leased lines would not impose a sufficiently material constraint on the prices of TI leased lines.

  - There is generally widespread stakeholder agreement that leased lines and NGA are not good substitutes.[154] This is reflected in CPs' marketing of broadband to consumers on their websites. Hence, as with Ethernet leased lines, we do not include NGA services in the TI market.

- EFM is cheaper than low bandwidth TI and it would be capable of delivering symmetrical bandwidth at 2Mbit/s. However, stakeholders generally seem to be of the view that most of the installed base of TI users are more likely to migrate to Ethernet leased lines, perhaps reflecting the quality differences described above. In any case, the number of EFM circuits is relatively small and the inclusion of EFM within the low bandwidth TI segment would not significantly alter BT's service shares.[155]

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[150] NGA often supports download speeds above 30Mbit/s and upload speeds above 2Mbit/s
[151] Annex 10 contains our main discussion of asymmetric broadband services (including NGA) and EFM services.
[152] As discussed in Annex 9, a greater proportion of end-users have concerns in switching to NGA than Ethernet leased lines.
[153] [✂] response to Market Questionnaire.
[154] Though there is less agreement about the reasons for this, to judge from stakeholder responses to the April 2014 CFI and market questionnaires, discussed in Annex 9.
[155] We also note that EFM is provided using BT's unbundled copper local loops, not the local access network used to provide other Ethernet services. EFM services are included in the CISBO market on demand-side substitution grounds.

5.20.3 Barriers to switching to NGA and EFM:

- End-users switching from TI leased lines to either asymmetric broadband or EFM would face similar barriers to those switching to Ethernet services. In addition to these, there may be particular issues associated with migrating leased lines to asymmetric broadband, which may include adjusting existing systems in anticipation of different levels of contention, latency and lack of synchronisation.

Product market proposals

5.21 In light of quality differences, relative prices, the apparent lack of sensitivity of customers to past changes in relative prices of TI and Ethernet and barriers to switching, our view is that Ethernet and other technologies do not fall within the same markets as TI low bandwidth services.

TI services at higher bandwidths

Introduction

5.22 In the 2013 BCMR, we identified separate markets for TI services at 34/45 Mbit/s and at 155 Mbit/s. We based this on price evidence and our assessment of differences in competitive conditions.

5.23 We identified separate geographic markets for the two TISBO markets above 2Mbit/s for the WECLA and the rest of the UK (excluding Hull). BT was found not to have SMP in the WECLA for higher bandwidths, but we found BT to have SMP in the rest of the UK (excluding Hull).

5.24 Based on our circuit volume data, across the UK, we estimate that BT sells a maximum of [✂] TI services above 2Mbit/s with over three quarters of these outside the CLA and LP. For these 'markets' BT has a large share above 60% outside CLA and LP, but within the CLA and LP BT's share is below 30%. In our charge control assessment, we forecast significant declines in these circuit volumes, resulting in fewer than [✂] circuits remaining within the three year timeframe of this review.

Product market assessment

5.24.1 *The product characteristics unique to TI are less important for higher bandwidths*:

- We consider that TI services above 2Mbit/s are most likely to be used for general data transmission purposes. The quality requirements of data transmission are more easily satisfied by Ethernet than those of voice transmission or telemetry applications for which a 2Mbit/s TI leased line is more likely to be used.[156] Service quality differences are therefore much less important for higher bandwidth TI leased lines than for those of 2Mbit/s and below. Our analysis leads us to consider that migration from TI services above 2Mbit/s to Ethernet will continue over the three year review period.

[156] For this kind of use, the view reflected in the EC Recommendation, where CI and TI are generally viewed as substitutes, is likely to apply. Indeed, we know from the 2013 BCMR that quite a few TI circuits above 2Mbit/s were used for mobile backhaul applications which have now largely migrated to Ethernet interfaces.

5.24.2 *Price and migration analysis support the view that there are fewer concerns for higher bandwidth TI customers switching to Ethernet*:

- Our price analysis in Annex 10, Figure A10.2 also shows that TI services at higher bandwidths are significantly more expensive than Ethernet services of equivalent bandwidth and also more expensive than low bandwidth TI.[157]

- The pricing of higher bandwidth TI services suggests two things:

  - there are strong incentives for higher bandwidth TI users to migrate to Ethernet, which are less likely to be tempered by a requirement for TI characteristics than is the case for some low bandwidth TI customers; and

  - customers at lower bandwidth TI wishing to upgrade bandwidth would be more likely to switch to Ethernet than upgrade to higher bandwidth TI services.

- These migration trends can be observed within market volume trends, as the base of high bandwidth TI services is already very low relative to other leased lines segments and there are virtually no new connections of TI high bandwidths.[158] We observe that 100Mbit/s Ethernet (and increasingly 1Gbit/s) account for the very large majority of new supply.[159] This is further supported by evidence from our market questionnaires and consumer survey evidence.[160]

- Further, unlike low bandwidth TI customers, some of whom place weight on the product characteristics of TI, we think it unlikely that there will be in future a significant number of high bandwidth TI customers who continue to require high bandwidths and TI characteristics.

5.24.3 *Given price savings available, TI users have greater incentive to overcome barriers to switching:*

- Some barriers to switching would remain where a user is switching technologies (i.e. between TI and Ethernet). However, given the significant savings associated with moving to Ethernet, there is a greater incentive on the end-user to overcome these barriers than there is at low bandwidths.

TISBO services above 2Mbit/s are no longer market(s) susceptible to *ex ante* regulation

5.25 Our view is that we should not include higher bandwidth TI services above 8Mbit/s within the low bandwidth TI market.

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[157] There are significant price differences between 2Mbit/s TI and higher bandwidth increments (i.e. 34/45Mbit/s and 140/155Mbit/s). There are also significant price savings associated with Ethernet relative to higher bandwidth TI services.

[158] CONFIDENTIAL - In 2013/14 BT's installed base was only [✂] local ends at 34/45Mbit/s and [✂] local ends at 155Mbit/s. It also appears that low bandwidth TI users are not upgrading to high bandwidth TI, as there are virtually no new connections of TI high bandwidths (BT only made [✂] new TI connections above 2Mbit/s in 2013/14).

[159] CONFIDENTIAL - According to BT data, there [✂] new Ethernet connections at 100Mbit/s or 1Gbit/s out of a total of [✂] Ethernet connections in 2013/14. This compares to a total of [✂] TI new connections in 2013/14.

[160] In Annex 10, we note that respondents to our market questionnaires have observed that once low bandwidth TI users decide to switch, for example for higher bandwidths, they are moving to Ethernet.

5.26 As discussed above, the high bandwidth TI services continue to display significant differences to low bandwidth TI. In addition we anticipate very low installed volumes by the end of the period covered by this review, noting that for high bandwidth TI services, there are economic incentives to switch to Ethernet services and more scope to do so than at low bandwidths.

5.27 However, and bearing in mind that market definition is a means to an end, we consider it would not be appropriate to include higher bandwidth TI services within the product market that includes Ethernet services and in which BT has SMP. We consider that to do so would be disproportionate because the imposition of *ex ante* regulation on higher bandwidth TI services is unnecessary and, consequently, it would be inconsistent with our duty to apply objective, transparent, non-discriminatory and proportionate regulatory regulatory principles in pursuit of the policy objectives set out in Article 8 of the Framework Directive.

5.28 Instead, in our regulatory judgment, we consider the appropriate approach is to regard the TI mid and high bandwidth markets as markets which are no longer susceptible to *ex ante* regulation because they no longer fulfil the three criteria test set out in the EC Recommendation:[161]

- the presence of high and non-transitory structural, legal or regulatory barriers to entry;
- a market structure which does not tend towards effective competition within the relevant time horizon, having regard to the state of infrastructure-based and other competition behind the barriers to entry;
- competition law alone is insufficient to adequately address the identified market failure(s).

5.29 Our analysis in Annex 10 also leads us to consider that the market failures identified in the medium and high TI markets in the 2013 BCMR, which arose from BT's SMP and for which extensive or frequent and timely intervention was previously considered indispensable, are no longer present.

Wholesale TI market at low bandwidths

5.30 In our retail market assessment, we propose to define separate markets for CI and TI services and hence we identify a single low bandwidth retail TI market. In light of the proposed separate retail TI market, it follows that we identify a separate wholesale TI market for low bandwidth services.[162]

5.31 As discussed in our market context section, retail TI services are provided on an end-to-end basis, but at the wholesale level can be further segmented into symmetric broadband origination (access and backhaul) and trunk. Hence, we identify wholesale markets for low bandwidth Traditional Interface Symmetric Broadband Origination services and TI trunk.

[161] When considering if any market listed in the EC Recommendation is not susceptible to *ex ante* regulation in the specific national circumstances, NRAs should demonstrate that at least one of these three criteria is no longer met.

[162] This is because substitution between CISBO and TISBO services at the wholesale level is only feasible if substitution also occurs at the retail level. A CISBO service would not be used to provide a retail TI service or vice versa.

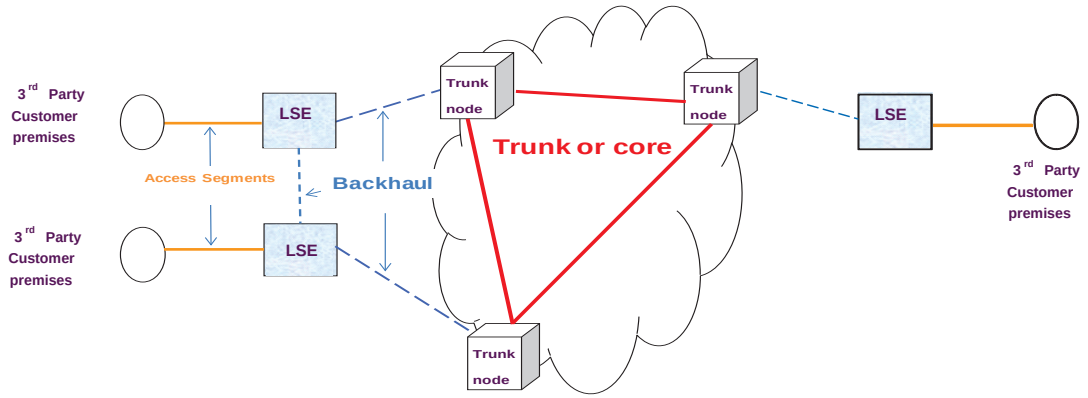
5.32 We also include mobile backhaul links consuming TI services (RBS backhaul) in the wholesale TISBO product markets.[163]

Identifying the boundary between TI terminating segments and trunk networks

Introduction

5.33 In the UK, most infrastructure providers have high capacity networks allowing them to link together major urban locations. The high capacity networks between the main network nodes are known as trunk or core segments as depicted in Figure 5.1 below.

Figure 5.1: Trunk versus terminating segments



Source: Ofcom 2015

5.34 In the EC Recommendation, trunk segments are deemed competitive and a market not susceptible to regulation:

> "…[a] clear distinction between the terminating and trunk segment is important as the market for wholesale trunk segments of leased lines has been removed from the list of markets susceptible to ex ante regulation in the 2007 Recommendation. Nowadays, almost all Member States have deregulated this wholesale market for trunk segments. Therefore the presumption that trunk segments are replicable on a national scale remains valid. Consequently, NRAs should not revisit their analysis of trunk segments of leased lines where these have been previously found to be effectively competitive. This assumption does not exclude, however, that individual NRAs might find that certain trunk routes fulfil the three criteria and thus warrant ex ante regulation."

[163]We discuss mobile backhaul links in Annex 11. We observe that in future the majority of backhaul links will use Ethernet interfaces, but we noted MNOs' expectation that they will continue to demand TI services, at least over the next few years of this market review period. These mobile backhaul links consuming TI services are known as RBS backhaul, and we continue to include them in the wholesale TISBO product markets.

5.35 In the 2013 BCMR Statement, we identified the boundary between trunk and terminating segments at Trunk Aggregation Nodes (TANs). For example, as shown in Figure 5.1 above, any circuit between different trunk nodes[164] was classified as a trunk segment. For trunk segments, we made a further subdivision of trunk into:

- *competitive 'national trunk'*: these were typically segments serving longer distance national routes between major cities. We found these routes to be effectively competitive; and

- *uncompetitive 'regional trunk' markets:* we identified shorter distance regional routes. We found BT to have SMP in the provision of regional trunk segments.

No changes to 'National' TI trunk market

5.36 In Annex 19 we explain our proposals not to revisit our analysis of competitive national trunk segments, in line with the EC Recommendation.

5.37 We propose to use the same national trunk market definition as in the 2013 Statement due to the forecast ongoing decline in TI circuit volumes. Unlike AI core, the evidence suggests that CPs are not expanding the coverage of their TI trunk networks. The declines in the TI market have negatively affected the degree of interconnection by CPs with BT for TI services.[165] Hence, a change now to, say, increase the number of TANs (and hence deregulate further) would therefore clearly be against the direction of travel within the market. But equally, rationalisation of the number of interconnect point does not mean that CPs have withdrawn from some national trunk routes. In the interests also of regulatory stability, we propose to retain our existing TAN definition.[166]

Inclusion of 'Regional' trunk within terminating segments markets

5.38 We also propose to dispense with the distinction between the remaining uncompetitive TI trunk segments and terminating segments, and to treat all of these circuits as terminating segments.

5.39 In the 2013 BCMR Statement, our analysis suggested that regional trunk circuits faced similar competitive conditions to terminating segments. We observed that

[164] More specifically, for each TI TAN we defined a "catchment area" which represents all of the smaller exchanges and customer end-points that the major BT nodes are assumed to serve. In the 2013 BCMR, we defined any circuit linking A and B-ends in different TAN catchment areas as containing a trunk segment routed via a trunk node. Hence, in Figure 5.1 above, if a retail circuit linking two third party customer premises fell within different TAN catchment areas, then we would deem that the circuit would be routed via trunk nodes.

[165] The evidence suggests that OCPs are actively reducing the number of interconnection points for TI services. BT also has an empty order book for new interconnect connections for TI markets. BT has also commented on the decline in this market in its regulatory financial statements, where it stated that *"PoH has been impacted by customers rationalising their networks, i.e. reducing the number of sites and consequently points of handover, and instead increasing the bandwidth to remaining sites."* Page 106, http://www.btplc.com/Thegroup/RegulatoryandPublicaffairs/Financialstatements/2013/CurrentCostFinancialStatements2013.pdf

[166] It is clear that the overall TI trunk market will not have expanded. First, the key demand centres for TI services will not have changed fundamentally. Our TANs definition identifies at least one trunk node for most of the major urban centres in the UK. If anything, the evidence suggests that OCPs are actively reducing the number of interconnection points for TI services with no new PoH connections expected.

many circuits which included a 'regional trunk' segment were not trunk routes that made up part of the core networks, but rather relatively short distance circuits linking customer end-points to an OCPs' interconnect point at a nearby BT exchange.[167] These circuits are essentially similar in nature to terminating segments and hence competitive conditions are also similar.

5.40 In light of similar competitive conditions for regional trunk circuits and terminating segments, we propose to include them within the terminating segments market.[168] We note, however, that this simpler product market definition could have implications for remedy design. The network access rules for TI services are designed to ensure equivalent outcomes in terms of downstream retail competition. We therefore discuss in Section 11 the need to ensure that BT provides TI terminating segments (including those which used services previously called 'regional trunk') on a non-discriminatory basis.

Geographic market definition

5.41 As in previous market reviews, we propose the market for low bandwidth TISBO services to have a national scope. While we acknowledge that the amount of rival infrastructure is greater in some areas, especially in the central London, we do not consider that these variations warrant definition of separate geographic markets for low bandwidth TISBO services. Our market share analysis clearly indicates that BT, in all parts of the UK (outside the Hull area), accounts for the large majority of low bandwidth TI circuits. Whilst the lack of entry in this market may reflect past BT pricing behaviour, low bandwidth TISBO circuits are low value, legacy services and the decline in volumes forecast means that we do not expect competitive conditions to change materially over the course of the review period.

5.42 We consider that BT's very high share, significantly greater than 50% across the UK (and thus as recognised in the SMP Guidelines at a level consistent with single firm dominance) indicates that competitive conditions are broadly homogenous, and that defining separate geographic markets would not yield differences in SMP findings.

SMP assessment

Introduction

5.43 We find that BT has SMP in the market for wholesale low bandwidth (of up to and including 8Mbit/s) traditional interface symmetric broadband origination (TISBO) services in the UK outside the Hull area.

5.44 Annex 13 describes our approach to assessing market power. Our market power determinations are the result of a thorough and overall forward-looking analysis of

[167] As we explain in Annex 19, the designation of circuits between adjacent TANs as including a trunk segment was often notional, and a product of the PPC routing rules. By contrast, it was clear that circuits between non-adjacent TANs in major urban centres would be more likely to be routed across OCPs' own competing trunk networks.

[168] Other European NRAs have taken account of competitive conditions in defining the boundary between core and terminating segment markets. For example in the Irish NRA's last review of leased lines, it set out: "It is clear that there are large parts of the core network where investment in alternative infrastructure has not occurred and where competitive products and services are unavailable. Where these (i.e. uncompetitive) supply conditions exist, [....] the services provided are regarded as being in the terminating segment market."

the economic characteristics in relevant markets, based on existing market conditions. Below we first describe the market in terms of volume trends and prices, before setting out our assessment of each SMP criteria, whereby we note that, individually, each criterion is not necessarily determinative.

5.45 While volumes have been in decline, and are forecast to decline going forward, we expect a significant number of customers to continue using low bandwidth TISBO services during the review period (as discussed in Section 3 and paragraph 3.42). The continued use is an important consideration in our proposal to define a market for low bandwidth TISBO services. Volumes in higher bandwidth TISBO services are significantly lower, and forecast to decline to very low levels over the review period. In addition, we note that OCPs are to a lesser extent involved in provision of legacy TISBO services than they are in supplying Ethernet and WDM services. For example, Zayo and EU networks provide a very limited number of legacy TISBO services.

Application of SMP criteria

5.46 We estimate BT's share of volumes in the supply of low bandwidth TISBO services in the UK outside the Hull area at 89%. As explained in Annex 13, we interpret (in accordance with the SMP Guidelines) a market share of this very high level to be a strong indicator of SMP unless special circumstances apply. In addition, we note that BT has maintained the very high share in the supply of these services as estimated in our previous reviews.

5.47 We consider that BT gains a significant competitive advantage from its extensive network infrastructure allowing it to provide services to most customers in the UK outside the Hull area at lower incremental costs and quicker than OCPs. This advantage and the factors driving it are explained in greater detail in Annex 13. OCPs will incur significant sunk costs when extending their networks, which will make them cautious to invest in network extension required for serving new customer sites.

5.48 BT's network advantage is likely further strengthened by economies of scope and scale. We consider that economies of scope and scale are likely present in this market, with economies of scope being more material. BT, benefitting from its provision of a wider range of services to a greater number of customers, can offer services at a lower average cost than OCPs. An entrant would need to gain a large share of the market to achieve a comparable cost level. As entry on this scale would depress the post-entry price and profitability, entry may be deterred.

- Some of the physical infrastructure used to supply low bandwidth TISBO services can also be used to supply other business connectivity services. This allows BT to benefit from its ability to share infrastructure costs across a wider range of services and greater volumes than OCPs (at least outside the CLA).

- BT has by far the most extensive PSTN access network infrastructure and the largest PSTN customer base, with many of the same network assets, including access duct, being used to provide low bandwidth TISBO services. Its scope provides BT with a significant advantage in terms of cost and service delivery times.

- The costs associated with the shared part of the network where economies of scale arise may be quite significant for low bandwidth TISBO services. Equipment and infrastructure required in network nodes, and required to provide connectivity between nodes, are shared by business connectivity services. The

higher the volume of business connectivity services over which these costs can be spread, the lower the unit cost. Low bandwidth TISBO services can be carried over high-capacity aggregate bearer circuits, giving rise to economies of scale with average costs declining as low bandwidth TISBO volumes increase.

5.49 We consider – as explained in Annex 13 – that significant barriers exist in markets for wholesale leased lines, and the low bandwidth TISBO market, in particular.

- These barriers arise from the asymmetry between BT and OCPs in terms of the amount and coverage of existing network infrastructure. BT has extensive network connecting to most sites in the UK outside the Hull area, whereas OCPs would frequently have to (significantly) extend their networks in order to connect new customers. The significant costs of network extension and the sunk nature of investment costs mean that OCPs cannot justify the investments due to the risk of not recovering investment costs being too great.

- We note that the latter risk is particularly great in low bandwidth TISBO as revenue opportunities are limited due to low value of services, declining volumes, and switching costs limiting the proportion of volumes that can be contested.

5.50 As explained in Annex 13, the effective exercise of buyer power requires the buyer to have an alternative source of supply, such as a competing CP or the ability to self-supply. Practically, an alternative source of supply requires OCPs to have network infrastructure near customer sites. Whether OCPs have network infrastructure near customer sites depends on the location of sites and thus varies case-by-case. We do not consider that buyer power can materially constrain BT's market power.

- The limited amount of rival CP infrastructure in most areas outside the centre of London implies that OCPs are frequently not a viable source of supply as they cannot justify investments in network extension.

- Self-supply will in most cases, and for similar reasons not be justifiable. With a limited amount of rival infrastructure present, purchasing the service from BT will be more economic than building one's own network.

- The great majority of BT's low bandwidth volumes of TISBO, 65%, are supplied to BT downstream divisions, with volumes purchased by other customers representing a small proportion of BT's wholesale volumes. Under such circumstances, (and as further explained in Annex 13), buyer power is unlikely to effectively constrain BT.

5.51 We consider prospects for competition to be poor, and do not expect the market to become more competitive over the review period. This is because volumes are declining, and the value of services (as evidenced by prices) is low. This suggests that OCPs are unlikely to be able to justify extending their networks to provide these services. Costs of network extension will for most distances be too great. Even in areas where OCPs have infrastructure which could be used to supply low bandwidth TISBO services, and allowing for the possibility that relative prices may change, we do not expect competitive conditions to change materially over time.

5.52 We identify lower bandwidth Ethernet services and NGA as alternatives for at least some existing users of low bandwidth TISBO. Having assessed these products, we do not consider that these products, either alone or jointly, exert more than a limited constraint on BT's market power.

- Lower bandwidth Ethernet services, including those provided using EFM, could be an alternative for users with no strict quality of service requirements.

- Our survey evidence indicates that some users of business connectivity services may regard NGA as a substitute for low bandwidth TI services, but overall do not suggest that they are sufficiently close substitutes to be regarded as part of the same market. [169] However, as NGA is unlikely to provide the level of services most end-users require, we consider the impact of an additional constraint to be limited. We also note that there are a number of CNI users – with high quality requirements – likely to switch to 2Mbit/s TI services from very low bandwidth services over the course of the review period.

- The low value of services implies that switching costs can significantly reduce incentives to switch to alternative options. We also note that the substitution observed largely concerns migration to higher bandwidth services, and that this migration is driven by long-term requirements more than relative price differences.

Proposed SMP finding

5.53 In the light of our overall assessment of criteria and economic characteristics, we find BT to have SMP in the market for low bandwidth (up to and including 8Mbit/s) TISBO services in the UK outside the Hull area.

Consultation questions

Question 5.1: Do you agree with our proposal to identify a single product market for Traditional Interface Symmetric Broadband Origination (TISBO) services at low bandwidths with a single geographic market for the UK (excluding Hull)? If not, what alternative would you propose and why?

Question 5.2: Do you agree with our proposal not to identify any other Traditional Interface Symmetric Broadband Origination (TISBO) services above 2Mbit/s? If not, what alternative would you propose and why?

Question 5.3: Do you agree with our SMP assessment with respect to low bandwidth TISBO services? If not, what alternative would you propose and why?

Question 5.4: Do you agree with our approach to, and proposed product and geographic market definition for, wholesale TI trunk, including our proposal to treat 'regional trunk' segments as part of the TISBO market? If not, what alternative would you propose and why?

[169] See Annex 9, paragraphs A9.32 to A9.41.

Section 6

Assessment of Wholesale and Retail Markets in the Hull area

Introduction

6.1 This Section presents our assessment of wholesale and retail leased lines markets in the Hull area.

6.2 We propose to identify the following wholesale and retail markets in the Hull area:

6.2.1 Wholesale market for low bandwidth (up to and including 8Mbit/s) Traditional Interface Symmetric Broadband Origination (TISBO) services;

6.2.2 Wholesale market for Contemporary Interface Symmetric Broadband Origination (CISBO) services;

6.2.3 Retail market for low bandwidth (up to and including 8Mbit/s) Traditional Interface (TI) services; and

6.2.4 Retail market for Contemporary Interface (CI) services.

6.3 We find that competitive conditions in the Hull area continue to be distinct from those in the rest of the UK (in this Section, the rest of the UK concerns the UK outside the WECLA) in that:

- KCOM (and not BT) is the only CP with extensive coverage and a large installed base of customers for fixed telecommunications services. KCOM accounts for the large majority of wholesale supply of leased lines in the Hull area, with an estimated 86% of low bandwidth TISBO and 97% of CISBO services; and

- Unlike the rest of the UK, in the Hull area the availability of regulated wholesale products has not been sufficient to allow effective competition in the supply of retail leased lines, with KCOM estimated to account for more than 70% of leased lines in both retail markets.

6.4 In light of these high market shares and other evidence concerning KCOM's strong position in supply of leased lines in the Hull area, our proposed finding is that KCOM has SMP in the supply of low bandwidth TI and CI services, at both the wholesale and (unlike the rest of the UK) the retail level.

6.5 We present our assessment in the following order:

i) **Wholesale leased lines markets**. We set out our proposals for the relevant product and geographic markets at the wholesale level and our proposed finding that KCOM has SMP across these wholesale markets.

ii) **Retail leased lines markets**. We set out our proposals for the relevant markets at the retail level and our proposed finding that KCOM has SMP in retail markets notwithstanding the availability of regulated wholesale products.

iii) **Application of the EC's three criteria test to retail markets.** We present our application of the three criteria test to the retail markets identified in the Hull Area. This is required because the EC's Recommendation does not list retail leased line markets as being susceptible to *ex ante* regulation.[170]

Assessment of competition in wholesale markets

Product market definition

6.6 We consider that our key findings regarding product market definition in the rest of UK (as set out in Sections 4 and 5, and Annexes 8 to 12) are also appropriate for the Hull area; in particular:

- We do not include asymmetric broadband (NGA) products in our markets for leased lines. For the reasons given in Section 4, we do not consider that sufficient users of leased lines will regard asymmetric broadband as a sufficiently close substitute to warrant its inclusion in leased lines markets.

- We include Ethernet First Mile (EFM) services in the market for CISBO services. For the reasons given in Section 4, we consider that users of leased lines view EFM services as a good substitute for bandwidth requirements of up to about 30Mbit/s to 40Mbit/s.

- We define separate markets for low bandwidth TISBO and CISBO services, respectively. As discussed in Sections 4 and 5, TISBO services are legacy services and its current users are migrating over time to CISBO (or other) services. We consider that low bandwidth TISBO and CISBO services are not sufficiently close substitutes to be included in a single market as it is unlikely that this process of migration would be affected by modest changes in relative prices. In addition, the potential for competition for CISBO services is in principle greater than for TISBO services (though in the Hull area there is very little competition for either).

- We do not think it appropriate to segment CISBO leased lines into sub-markets on the basis of bandwidth or technology. We consider that these services are likely linked by a chain of substitution and that KCOM is likely to have a strong market position for CISBO services at all bandwidths.[171]

- We do not define a separate market for higher bandwidth TISBO services. We consider that the conditions in higher bandwidth TISBO markets, for the same reasons and based on similar developments as observed in Section 5 point to these markets no longer being susceptible to *ex ante* regulation.

[170] Commission Recommendation of 9 October 2014 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.

[171] WDM services are not currently available in the Hull area. We consider, based on the asymmetry in network infrastructure between KCOM and OCPs, that should demand for such services arise KCOM would be in a very strong position to supply such services.

6.7 Accordingly we propose to adopt for the Hull Area the same wholesale product markets that we propose for the rest of UK,[172] namely:

6.7.1 wholesale market for low bandwidth (up to and including 8Mbit/s) TISBO services; and

6.7.2 wholesale market for CISBO services.

Geographic market definition

6.8 As in previous reviews, we define the Hull area as a distinct geographic market. KCOM (and not BT) is the CP with the more extensive coverage and greater installed customer base in the Hull area, indicating a clear difference in competitive conditions from the rest of the UK.

6.9 We propose to retain the boundaries of the Hull area as delineated in the previous review. These boundaries follow the definition of 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 KCOM Group plc.

SMP assessment in wholesale markets

6.10 We propose to find that KCOM has SMP in the markets for low bandwidth TISBO and CISBO services in the Hull area, and we do not expect KCOM's position in these markets to change over the course of the review period.

Control of infrastructure not easily duplicated

6.11 We explain in Section 4.1 above why network infrastructure, in our view, is the main determinant of competition for supply of wholesale leased lines, as CPs require network in the proximity of a site in order to compete for supply of lines to that site. We also note that the presence of rival infrastructure is an indicator of differences in competitive conditions, with potential for competition confined to areas with greater presence of rival infrastructure.

6.12 KCOM's duct network is ubiquitous in the Hull area. It is because of its extensive network infrastructure that KCOM can supply wholesale leased lines to almost any site in the Hull area within a relatively short period of time and without incurring substantial costs in extending its network.

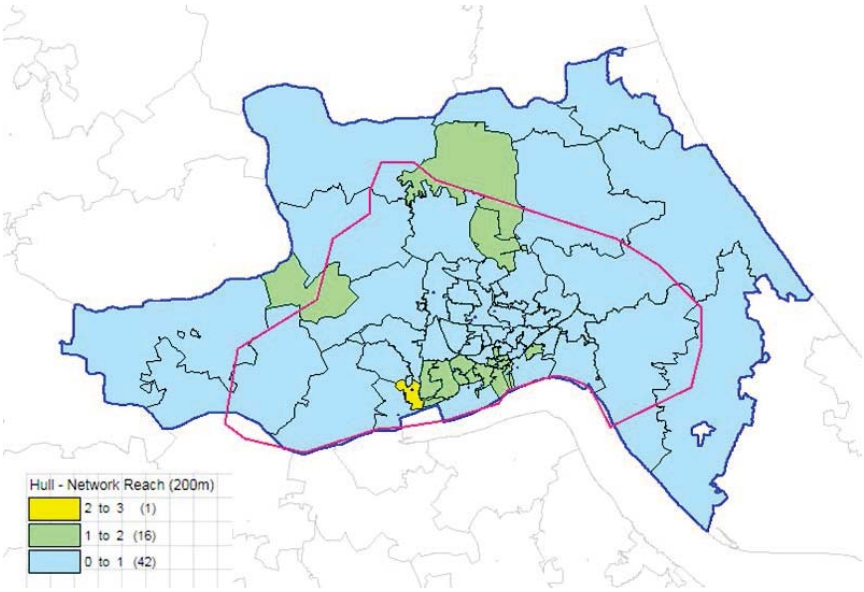
6.13 We do not consider that OCPs (i.e. CPs other than KCOM) have the ability or incentive to duplicate KCOM's network infrastructure in the Hull area. The costs of developing such an extensive network infrastructure would be very significant, and with KCOM already having developed its extensive infrastructure and having largely sunk the costs of doing so, OCPs would unlikely be able to recover their investment costs.

6.14 OCPs have some existing infrastructure in the Hull area, but it is very limited in comparison to KCOM's. Figure 6.1 illustrates the degree to which KCOM faces rival infrastructure in the Hull area. It shows that there is only one postcode sector in the Hull area where businesses have on average two OCPs located within 200m of their

[172] See Sections 4 and 5.

sites. Moreover, as discussed in Section 4, we do not consider that the presence of an average of two OCPs located within 200m is in itself sufficient for effective infrastructure-based competition.

Figure 6.1 The distribution of network reach across postcode sectors in the Hull Area



Note 1: We determine the network reach value of a postcode sector as the average number of OCPs with a flexibility point within 200m of business sites located in that sector. Network reach values provide an estimate of presence of rival infrastructure. In the context of the Hull area, this concerns infrastructure owned and operated by CPs other than KCOM. Annex 15 provides a more detailed description and explanation of the network reach analysis undertaken.

Note 2: The purple line indicates the boundary of the Hull license area, the area we defined as the Hull geographic market (i.e. the Hull area) for the purpose of this review. The boundary of this area does not align with the boundaries of postcode sectors (indicated in black and blue). However, we use postcode sectors for our data analysis.

Source: Ofcom analysis.

6.15 In the previous review, we noted that MS3 was in the process of extending its network in the Hull area. Our analysis of rival infrastructure shows that MS3's extension of infrastructure has been limited, and the service share analysis we carried out indicates that MS3 supplies a very limited number of leased lines. Furthermore, we understand the provision of business broadband services rather than leased lines to be MS3's primary focus.

6.16 Two other OCPs have recently made network extensions in the Hull area, and indicated that they may make use of their extended infrastructure to compete for supply of wholesale leased lines.

6.16.1 BT has told us that it has increased its presence in the Hull area by installing a multi-service edge node at its Anson Exchange in the centre of Hull. Once fully operational, this will enable BT to provide Ethernet services to sites in the Hull area, using a combination of its own infrastructure and regulated wholesale products purchased from KCOM.[173]

[173] Up to now, BT had to interconnect remotely (outside the Hull area), relying on KCOM wholesale products for Ethernet connections between sites within the Hull area and handover points outside the Hull area.

6.16.2 CityFibre has announced the completion of the first phase of a 62km fibre network in the Hull area that will be used to provide dark fibre to mobile base stations operated by MBNL, and has indicated that it intends to expand its network to provide services to other sectors.[174]

6.17 While we recognise that these recent network extensions improve the potential for competition in markets for wholesale leased lines in the Hull area, we consider that, over the three year period of the review, KCOM will continue to remain the only CP with a duct network that extends to most sites in the Hull area, and will commonly be the only CP with network infrastructure close enough to customer sites to be a realistic supplier. As a result, KCOM will continue to derive an advantage from its control over its more extensive network in the Hull area over the review period.

Market share and market share trends

6.18 Table 6.1 presents distribution of CP shares and total volumes, in the markets for low bandwidth TISBO and CISBO services. Annex 15 explains the approach followed in estimating market shares based on "customer ends".[175]

Table 6.1: Distribution of shares in wholesale markets in the Hull area

	Low bandwidth TISBO	CISBO
KCOM	86%	97%
BT	13%	2%
Level 3	0%	0%
Colt	0%	0%
Interroute	0%	0%
Total volumes	1,893	938

Source: Ofcom analysis.

6.19 According to our estimates, KCOM maintains a very high share in both markets: 86% in low bandwidth TISBO, and 97% in CISBO. KCOM's very high shares give rise to a strong presumption that KCOM has SMP, corroborating the evidence regarding the limited presence of rival infrastructure described above.

6.20 In the previous review, we found KCOM to have a share close to 100% in both markets. While our estimates of market shares suggest that OCPs sell at least some wholesale services in the Hull area, the only other CP that sells material volumes is BT, which has 13% in low bandwidth TISBO, and 2% in CISBO. Moreover, we note that our estimates likely underestimate KCOM's actual shares as a number of circuits supplied by BT outside the licensed area are included in the data analysis.[176] The

[174] CityFibre press releases 14 November 2014 and 31 March 2015.
[175] Customer ends refer to leased lines circuit ends terminating at customer premises.
[176] We have calculated these shares for an approximation to KCOM's licensed area based on postcode sectors, some of which straddle over the boundary of the KCOM licensed area. This means that we may include some BT circuits that are supplied in these postcode sectors but which are in fact

incursions by OCPs are therefore not on a scale sufficient to suggest that KCOM now faces, or will face over the three year review period, effective competition.

Barriers to entry and expansion

6.21 As explained in Annex 13, sunk costs and switching costs can give rise to barriers to entry and expansion in wholesale leased lines markets. The large asymmetry between KCOM and OCPs – in terms of the presence and coverage of their networks, and installed customer base – strongly suggest that such barriers are likely to be present in the Hull area.

Economies of scale and scope

6.22 Annex 13 explains economies of scale and scope, and why, in our view, economies of scale and scope arise in wholesale leased lines markets. We consider that KCOM derives a material advantage from the scale and scope of its operations in wholesale markets for fixed telecommunications services – including leased lines – in the Hull area. The scale and scope of KCOM's operations are a degree greater than that of any OCP.

6.23 KCOM is not large when compared to OCPs that primarily operate outside the Hull area. A number of such CPs supplying wholesale leased lines in the Hull area have a greater customer base (in fixed telecommunications services and leased lines), in the UK as a whole, than KCOM. The scale and scope of operations outside the Hull area can have some bearing on costs incurred in providing leased lines. For example, a CP supplying a large number of Ethernet services in the UK outside the Hull area, like BT, may be able to negotiate lower prices of equipment per unit. However, as the costs of developing the infrastructure required for providing wholesale leased lines in the Hull area are much more significant, we do not consider that the benefits of large scale and scope outside the Hull area offset the advantages KCOM derives from its greater scale and scope within the Hull area itself.

Profitability analysis

6.24 As discussed in Annex 22, we do not place weight on the analysis of the profitability of KCOM's provision of wholesale services in the Hull area as we do not consider that the returns on capital employed (ROCEs) reported by KCOM provide a reliable reflection of economic profitability.

External constraints

6.25 Some users might be prepared to switch to services, such as asymmetric broadband, which are outside wholesale leased lines markets in response to a rise in the relative price of leased lines.[177] We refer to the effect (if any) of customers switching to services in other markets as an "external constraint" on the prices of leased lines.

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outside KCOM's licensed area. As such, the estimates of market shares in Table 6.2 underestimate KCOM's share of wholesale markets in the Hull area, though only very slightly.

[177] A product forms a distinct market if, in the event of a SSNIP, switching to other products would not be sufficient to make that SSNIP unprofitable. However, even if a SSNIP would be profitable, the possibility that substitution to products outside the market has some, though lesser, constraining influence on prices remains.

6.26 We note that KCOM is found to have SMP in all fixed telecommunications wholesale markets in the Hull area, and that KCOM is the only CP with an extensive network in the Hull area. KCOM's strong position in other fixed telecommunications markets implies that it is unlikely that external constraints materially affect our assessment of KCOM's SMP in wholesale markets for leased lines.[178]

Countervailing buyer power

6.27 We do not consider that countervailing buyer power is likely to effectively constrain KCOM. As explained in Annex 13, effective buyer power requires purchasers to have a credible threat to meet requirements through another source of supply. However, the limited presence of rival infrastructure in the Hull area, as evidenced in Figure 6.1 above, implies that purchasers of leased lines in the Hull area will typically have at most one OCP with network infrastructure within a reasonable distance of their site. This means that another source of supply will frequently not be available.

Prospects for competition

6.28 Annex 13 explains why and how we account for *potential* competition and *potential* entry as part of our SMP assessment. We consider that the longer-term prospects for competition in wholesale markets for leased lines in the Hull Area may be somewhat better than they appeared in the past, in the light of the recent investments by BT and CityFibre noted above. However, we do not consider that these or other potential investments will be sufficient for competition for wholesale leased lines to become effective over the course of the review period. This view is consistent with experience in the UK outside the Hull area, where BT faces some competition in many areas and has done so for some time, but despite this, it is only in the CLA, where businesses are particularly densely concentrated and where there are many competing networks, that competition is effective. In comparison, the Hull Area is smaller and geographically isolated. Moreover, the total demand for and value of leased lines are small in comparison to those in other parts of the UK, making the Hull area an unlikely location for OCPs to make significant investments in infrastructure.

Assessment of competition in retail markets

Market definition

6.29 In the remainder of this Section, we define retail markets in light of the fact that KCOM is subject to wholesale SMP regulation. That is, we assume KCOM has to provide access to its low bandwidth TISBO and CISBO products at regulated terms. Availability of KCOM's wholesale product implies that OCPs can use these wholesale products to compete for provision of retail leased lines. We refer to Section 14, paragraphs 14.3 and 14.4, for a summary of our proposals of wholesale SMP regulation in the Hull area.

6.30 The product scope of these retail markets mirrors that of the wholesale product markets defined above. This is because:

[178] KCOM is likely to be regulated in other fixed telecommunications markets in which it has a strong position. However, and despite this, external constraints by their nature tend to be relatively weak, whilst constraints from competition within wholesale leased line markets in the Hull area are also weak.

- The definition of those wholesale product markets took account of demand-side substitution at the retail level, and this is not affected by the imposition of wholesale SMP regulation.

- Whilst wholesale SMP regulation makes entry into retail markets quicker and easier, and so could in theory facilitate supply-side substitution between retail services, in practice we believe significant barriers to such substitution remain. In addition, the market for CI services already includes a broad range of services and we do not consider that low bandwidth TI and CI services should be included in a single market given the material differences between them.

6.31 We consider and propose the following retail markets in the Hull area:

6.31.1 low bandwidth (up to and including 8Mbit/s) TI services; and

6.31.2 CI services.

Wholesale SMP regulation is not sufficient for effective competition in retail markets

6.32 As explained further below in our SMP assessments, we consider that, in the Hull area, wholesale SMP regulation has not been and will not be sufficient to sustain effective competition in retail markets within the period covered by this review. Under the existing wholesale SMP regulation, KCOM maintains a very high share in markets for retail leased lines, and we expect KCOM to maintain a strong position in these markets, the prime reason being that the limited presence of rival infrastructure (not just network, but also points of presence (PoPs)) in the Hull area severely impairs the ability of OCPs to compete for supply of retail leased lines.[179]

6.33 In accordance with section 91 of the Act, having reached the view that SMP regulation would not be sufficient for effective competition in retail markets over the three year period of the review, we consider it appropriate for these markets to be subject to *ex ante* regulation. This requires the three criteria test to be met,[180] our assessment of which is set out at the end of this Section, following the SMP assessments.

SMP assessments in retail markets

6.34 We propose to find that KCOM, despite the availability of KCOM's wholesale products at regulated terms, has SMP in the retail markets for low bandwidth TI and CI services in the Hull area, and we do not expect KCOM's position to change materially over the course of the review period.

Market share and market share trends

6.35 We have collected circuit data on CPs supply of leased lines in the Hull area, which we use to estimate KCOM's retail market share:

[179] Effective retail competition requires that OCPs have the capability to combine regulated wholesale products purchased from KCOM with their own network infrastructure. We consider that their limited infrastructure in the Hull area implies that OCPs typically do not have this capability.
[180] ERG report on Guidance on application of the three criteria test, 2008.

6.35.1 We assume that the total volume of retail leased line sales in the Hull area is equal to the total volume of wholesale leased line sales in the Hull area (which is equal to the total volume of leased lines supplied "on net" by CPs).[181]

6.35.2 We estimate OCPs retail sales as the volumes of leased lines that they reported having supplied, whether originally sourced on-net or off-net;

6.35.3 We estimate KCOM's retail sales as the total volume of retail sales less our estimate of OCPs sales.

6.36 Having applied this approach, we estimate KCOM to have a share of 73% in low bandwidth TI, and 81% in CI services, in both markets significantly above the threshold for presuming SMP. Our wider assessment and understanding of competition in these markets support our estimates based on circuit data analysis.

6.37 The observation that KCOM, despite the availability of regulated wholesale products, has maintained very high shares in retail markets provides a strong indicator of KCOM not being effectively constrained by its competitors in these markets.

Control of infrastructure not easily duplicated

6.38 We consider that in the Hull area, despite the availability of KCOM's regulated wholesale products for use by any CP, KCOM derives a significant competitive advantage from its more extensive network infrastructure.

6.39 In order to offer a retail service a CP requires a wholesale product – the terminating segment connecting to a customer's site. The CP can either purchase this terminating segment from another CP or self-supply using its own network infrastructure. In the Hull area, OCPs would typically have to purchase the terminating segment from KCOM as they and other OCPs have no or only limited infrastructure in the proximity of sites. Given the circumstances in the Hull area – KCOM is frequently the only potential supplier of terminating segments – retail competition in the Hull area thus depends on the ability of OCPs to offer retail services by combining regulated wholesale products with their own network infrastructure.

6.40 Although OCPs can purchase regulated wholesale products, there are a number of factors which restrict OCPs in their ability to provide retail services combining regulated wholesale products with their own network infrastructure.

- In order to purchase regulated wholesale products from KCOM, OCPs need to interconnect their network with KCOM's network within the Hull area. This requires OCPs to make significant investments in order to extend their networks to the Hull area and to establish a PoP within the Hull area. OCPs are unlikely to be able to justify the investments required for building this infrastructure as the value of retail services is low, and in case of TI services also the declining demand. We note that OCPs typically opt to interconnect to KCOM's network outside the Hull area (typically at cities some distance from the Hull area), using unregulated wholesale products from KCOM. Remote handover increases the

[181] A circuit is provided on-net where the CP connects its electronic equipment to physical links it either owns and operates or leases from another company (for example dark fibre). A leased line that is provided using an active wholesale product purchased from another CP is referred to as 'off-net'.

costs of providing retail services, most clearly for circuits with both ends in the Hull area, and in itself provides an indication that OCPs typically do not have the capacity to interconnect with KCOM within the Hull area.

- A further barrier may be the need for bespoke configuration to interconnect with KCOM rather than BT as elsewhere in the UK. In particular, OCPs would need to establish new commercial, technical and operational arrangements to interconnect with KCOM and would need to develop their operational support systems to interface with KCOM's.

6.41 In the light of the above, we consider that OCPs are unlikely to invest in PoPs because the limited demand in the Hull area does not justify such investments. In most cases, the investment costs are likely to be too large when compared to the small scale of leased lines markets in the Hull area (1,893 low bandwidth TISBO and 938 CISBO circuits), particularly in circumstances where KCOM is the incumbent retail supplier to most existing users of retail services. Absent material investments in infrastructure, most OCPs, in our view, will remain dependent on KCOM for conveyance of traffic to handover points outside the Hull area, and will not develop the capability to provide retail services.

6.42 There are exceptions. As noted in paragraph 6.16 above, two OCPs, BT and CityFibre, have recently undertaken network extensions in the Hull area. In particular:

- BT installed a multi-service edge node at its Anson Exchange, and we understand that once this node is fully operational will increase BT's ability to serve businesses in the Hull area, by renting wholesale access circuits from KCOM to connect customer sites to its Anson exchange; and

- CityFibre has committed to investments in its fibre network in the Hull area initially to provide dark fibre to mobile base stations operated by MBNL, and has indicated that it intends to expand its network to provide services to businesses in other sectors.

6.43 These investments suggest that there is some potential, at least in the longer term, for retail markets in the Hull area to become more competitive over time. BT in particular will in the future be better placed to compete for circuits with one end in the Hull area and the other outside it. The same does not apply to CityFibre, which as of yet has not invested in an exchange and thus in the ability to hand over circuits within the Hull area. However, we do not consider that these investments will, by themselves, undermine KCOM's SMP at the retail level over the review period as:

- KCOM retains a competitive advantage in the Hull area because of the greater amount and coverage of its local infrastructure, and its capacity to provide services and engage at a local level.

- BT's sales of retail circuits that have a local end (or more than one local end) in the Hull area will be partly "off-net" and CPs generally have a weaker ability to compete for provision of retail circuits that are "off-net".[182]

[182] We understand this to be the case as the charges for off-net services will typically exceed the incremental costs of a CP that can provide retail services on-net. In addition, retail customers may prefer their services to be provided on-net if this is associated with greater quality and security.

- CityFibre's business model is one in which it supplies dark fibre to other CPs and it does not envisage operating in retail leased line markets.

- KCOM starts with a very high share of retail markets and erosion of this will take time. CPs have told us that it can be hard to induce users of leased lines to switch supplier unless contracts are up for renewal. More generally, and as noted in the BDRC end-user survey, retail users often perceive barriers to switching supplier.[183]

Economies of scale and scope

6.44 Even though wholesale remedies are designed to address any economies of scope and scale that could give KCOM a competitive advantage over OCPs in retail markets, we consider that KCOM may derive a competitive advantage based on its more extensive network infrastructure, and the scale and scope of its retail operations.

6.45 As noted above, cost effective use of regulated wholesale products requires network infrastructure and scale. Owning and operating network infrastructure, as explained in Annex 13, gives rise to economies of scale and scope due to the high proportion of fixed and common costs associated with developing infrastructure. A CP providing retail leased lines using terminating segments rented from KCOM would need:

i) Suitable accommodation, such as space in a KCOM exchange;

ii) Backhaul to connect its Hull node to its network outside the Hull area;

iii) Aggregation Equipment to combine terminating segments onto its backhaul circuits; and

iv) A support capability to maintain the equipment located at the PoP.

6.46 There would inevitably be some fixed costs associated with these and there would also be some economies of scale, particularly in relation to the fixed costs associated with establishing PoPs and in backhaul capacity.

6.47 The significant difference in network infrastructure between KCOM and OCPs in the Hull area implies that KCOM has a cost advantage in providing retail leased lines. The small size of the retail markets in the Hull area combines with KCOM's very high shares of them suggest that economies of scale and scope are likely to give it a material advantage. These factors suggest that OCPs would be unlikely to be able to match KCOM's costs.

Barriers to entry and expansion

6.48 In addition to the barriers to entry and expansion discussed in relation to network infrastructure and economies of scale and scope, switching costs likely give rise to barriers to entry and expansion in retail markets in the Hull area. The presence of switching costs makes it more difficult for OCPs to break into retail markets as they will struggle to convince retail customers to switch away from KCOM. Even changes

[183] See Section 8 of the BDRC end-user survey. Available at http://stakeholders.ofcom.org.uk/binaries/consultations/bcmr-2015/annexes/BCMR_2014_report-bdrc.pdf

in retail supplier where the wholesale supplier stays the same – which would be the standard case in the Hull area given KCOM's strong position in supply of wholesale services – often require changes in the physical routing of circuit resulting in a temporary loss of service for the customer. Reluctance to switch supplier is likely to be more important for low bandwidth TI services as this market is in decline.

6.49 In all, we consider that the circumstances in the Hull area – low volumes and value of retail leased lines, KCOM's very high share of existing customers, the impact of switching costs at the retail level, and the costs and scale economies associated with owning and operating network infrastructure in the Hull area – imply that material barriers to entry and expansion are present in these retail markets. The fact that only BT has actually set up a PoP in the Hull area provides further support for this.

6.50 In the case of low bandwidth TI services, these barriers are exacerbated by the declining demand and the low value per circuit, again with the cumulative effect of reducing OCPs' incentives to incur the costs required for entry into, and expansion in, this market.

6.51 Other factors, more specific to the Hull area, have the effect of raising barriers to entry in the market for CI services. At the time of the 2014 Wholesale Broadband Access market review, and unlike the UK outside the Hull area, competitive pressure from LLU operators providing Ethernet services using EFM technology was absent. The reasons for the absence of LLU operators in the Hull area were set out in Ofcom's wholesale broadband access market review, as follows:

> "One of the notable barriers to entry is the small market size. There are only a limited number of exchanges in the Hull Area, a number of which only serve a small number of premises. In addition, the costs of LLU deployment would be much higher than in the rest of the UK, in particular because of bespoke configuration and backhaul costs, since a PO [Principal Operator] would need to have an access point in (or around) the Hull Area. There are also fixed costs associated with purchasing LLU from KCOM, including the costs of developing systems that interface with KCOM's systems, which are required to order, maintain and manage LLU products. We understand that although a number of operators such as The Post Office and MS3 have considered taking LLU from KCOM, none have yet established plans to do so, a number citing that it did not make commercial sense due to do so."[184]

6.52 We consider that the small market size and the backhaul costs associated with interconnection outside the Hull area, noted above as reasons for the absence of LLU operators in the Hull area, are also particularly relevant for our assessment concerning the limited competition for retail leased lines in the Hull area.

Countervailing buyer power

6.53 We consider that buyer power is unlikely to effectively constrain KCOM's market power in these retail markets. Effective buyer power requires purchasers to be able to make credible threats to move volumes to another supplier. However, we consider that the lack of alternative suppliers of retail services, which is unlikely to be

[184] Review of the Wholesale Broadband Access Markets, Statement , 26 June 2014 paragraph 5.90 at: http://stakeholders.ofcom.org.uk/consultations/review-wba-markets/statement/

overcome due to the limited presence of rival infrastructure in the Hull area, means that customers are unable to exert countervailing power.

Prospects for competition

6.54 The longer-term prospects for competition in the retail markets in the Hull area may be somewhat better than they appeared in the past, in the light of the new investments by BT and the earlier investments by MS3 noted above. However, we do not consider that competition will become effective in the retail TI and CI markets in the Hull area over the period covered by the market review. The small size of the market, economies of scale and scope, and barriers to switching mean that over the course of the review period competition is unlikely to develop sufficiently for KCOM to be materially constrained by competitors and consumers.

Market power determinations

6.55 We find that KCOM has SMP in the retail markets for low bandwidth TI and CI services. We consider the proposed wholesale SMP regulation, as summarised in paragraphs 14.4 and 14.5 in Section 14, to be insufficient to sustain effective competition in retail markets. Some of the same factors which led us to find KCOM to have SMP in wholesale markets, also underlie our finding that competition in retail markets is not effective, i.e. the limited presence of rival infrastructure in the Hull area, economies of scope associated with owning and operating infrastructure, and barriers to entry and expansion. We take account of the prospects for competition in setting appropriate remedies in retail markets in the Hull area.

Application of the three criteria test to the retail markets in the Hull area

Introduction

6.56 We now show that the three criteria test is satisfied when applied to the retail markets for low bandwidth TI and CI services in the Hull area.[185] We note that as these markets are not included in the EC's Recommendation, *ex ante* regulation of these markets requires the three criteria test to be met.[186]

The EC's Recommendation

6.57 The EC's Recommendation lists those markets, at a European level, in which the EC considers *ex ante* regulation may be warranted. It is important to note that it is precisely because we have a duty to identify markets in which *ex ante* regulation may

[185] We note that, in our view, the three criteria test is not met when applied to the retail market for very low bandwidth services in the rest of UK. This was one of our considerations in not defining supply of very low bandwidth services as a market for regulatory review. One key difference between the retail markets in the Hull area and the retail market for very low bandwidth services in rest of UK is that users of very low bandwidth services in UK outside the Hull area have alternatives (low bandwidth TI services at 2Mbit/s and CI services) that are available in markets characterised by effective competition. This, in combination with continuing wholesale regulation, ensures that market failures due to SMP are absent in the rest of UK.

[186] Commission Recommendation of 9 October 2014 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.

be warranted *appropriate to our national circumstances,*[187] that we may identify markets that are not listed in the EC's Recommendation.

6.58 Insofar as is relevant, the EC's Recommendation states:

- "*Ex ante* regulation imposed at the wholesale level should be considered sufficient to tackle potential competition problems on the related downstream market(s). A downstream market should only be subject to *ex ante* regulation if competition on that market still exhibits significant market power despite the presence of *ex ante* regulation on the related wholesale upstream market(s)…Should a national regulatory authority…demonstrate that wholesale interventions have been unsuccessful, the relevant retail market may be susceptible to *ex ante* regulation provided that the national regulatory authority has found that the three-criteria test prescribed in this Recommendation is met";[188]

- "National regulatory authorities may identify other markets than those listed in this Recommendation and apply the three criteria test. A national regulatory authority should conduct a gradual analysis of the markets that [are] situated downstream from a regulated upstream input, to determine whether they would be effectively competitive in the presence of regulation upstream, until it reaches the retail market(s)"[189]; and

- "National regulatory authorities should also apply the three-criteria test to those markets listed in the Annexes to [the 2003 EC Recommendation][190] and to Recommendation 2007/879/EC[191] which are no longer listed in the Annex to this Recommendation if they are currently regulated in the light of national circumstances, in order to assess whether, on the basis of such national circumstances, such markets are still susceptible to *ex ante* regulation"[192].

The three criteria test

6.59 When identifying markets for regulatory review other than those listed in the EC's Recommendation, we should ensure the following three criteria are cumulatively met for each market:

i) the presence of high and non-transitory barriers to entry;

[187] See Article 15(3) of the Framework Directive. Section 79(1)(a) of the Act states that "OFCOM must identify (by reference, in particular, to area and locality) the markets in which in their opinion are the ones which in the circumstances of the United Kingdom are the markets in relation to which it is appropriate to consider whether to make [a market power determination]."
[188] See Recital 18.
[189] See Recital 21.
[190] Commission Recommendation 2003/311/EC of 11 February 2003 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.
[191] Commission Recommendation 2007/879/EC 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.
[192] See Recital 22.

ii) a market structure which does not tend towards effective competition within the relevant time horizon; and

iii) the insufficiency of competition law alone to adequately address the market failure(s) concerned.[193]

6.60 In assessing how the three criteria test is satisfied for the retail markets identified, we have taken due account of the EC's Explanatory Note. We have also taken account of the ERG Three Criteria Guidance, which provides guidance on the burden of proof required for sustaining that a market is a candidate market for *ex ante* regulation, and on the interaction between the three criteria and SMP assessment. We regard the following guidance of particular relevance to our assessment:

- first, "the burden of proof necessary to demonstrate that the three criteria are...met should under no circumstances be higher than the burden of proof required for a finding...of SMP";

- second, "it should be recalled that the first criterion (presence of high and non-transitory barriers to entry) and the second criterion (tendency towards effective competition) are inherently related to the SMP assessment. Therefore, in those cases where the SMP analysis will be undertaken (e.g. for the purposes of regulating a market no longer included in the Recommendation), reference to the SMP analysis should in principle be sufficient to prove that the first and second criterion are also met. The same conclusions should also hold true with regard to the level of detail (data that needs to be supplied) necessary for the passing of the three criteria";

- third, "the burden of proof for fulfilling the three criteria test and maintaining at national level a market that was included in [the Previous EC Recommendation] but that is no longer included in [the EC's Recommendation]...should be lower than the burden of proof that may be required for defining a market that has never made part of the list of candidate markets retained by the European Commission in its Recommendations"; and

- fourth, "in order to prove fulfilment of the three criteria test for maintaining regulation on a market listed in [the Previous EC Recommendation] but not in [the EC's Recommendation], in principle it should be sufficient for NRAs to substantiate why the elements invoked by the European Commission in its Explanatory Note to justify withdrawal of a market from the list on the basis of the three criteria are not applicable to the national circumstances, thus leading to the conclusion that the situation is closer to that existing under [the Previous EC Recommendation]."

Application of the three criteria test to the retail markets

<u>We consider there are high structural barriers to entry in these markets</u>

6.61 Whilst wholesale SMP regulation has been applied (and we propose continues to apply), we consider that the sustained absence of retail competition indicates there are high and non-transitory barriers to entry. As shown in our SMP assessment in retail markets (see paragraphs 6.48 to 6.52 above) we consider that OCPs in the retail markets for low bandwidth TI and CI face significant barriers to entry in

[193] See paragraph 2 of the EC's Recommendation.

establishing the network infrastructure and PoPs in the Hull Area that are necessary to effectively use KCOM's regulated wholesale products in providing retail services. With no or limited infrastructure in place, OCPs are typically not able to provide retail services. We consider that these barriers apply to the provision of both low bandwidth TI and CI services.

We consider the structures of these markets do not tend towards effective competition within the relevant time horizon

6.62 We do not consider that these retail markets will become effectively competitive over the course of the review period and they may not do so in the foreseeable future.[194]

6.63 We refer to our SMP assessments, see paragraph 6.54 above, for an outline of our view that the structures of these markets do not tend towards effective competition. More particularly, we note that (i) KCOM continues to maintain very high shares; and (ii) the small size of the markets and, in case of low bandwidth TI services low value of services, will mean that OCPs are unlikely able to justify the investments in network infrastructure, PoPs and local presence required for attaining the capability to compete for provision of retail services throughout the Hull area.

We consider competition law alone would be inadequate to address the market failure(s) concerned

6.64 We consider that even with wholesale SMP regulation in place, KCOM, in the absence of *ex ante* regulation in these retail markets, would have the ability and incentive to:

- engage in price and non-price practices that are unduly discriminatory;
- cease to provide some legacy services in the retail market (such as analogue leased lines) prematurely, in order to force customers to migrate to newer and more profitable services; and
- charge consumers excessive prices.

6.65 We consider *ex ante* regulation of KCOM's provision of retail leased lines would be more effective than reliance on competition law alone in guaranteeing a timely and effective response in addressing the risk of KCOM engaging in these practices, in particular for the following reasons:

- *Ex ante* regulation allows for the imposition of specific and targeted SMP remedies to address the competition problems identified and for the subsequent monitoring of those remedies:
    - In order to address the risk of excessive pricing, we are proposing to require KCOM to publish its retail prices to provide transparency about KCOM's charges. This will enable us or others to assess whether these charges are fair and reasonable.

[194] This is consistent with the approach taken in the EC's Explanatory Note in relation to the application of this second criterion.

  - Additionally, we are proposing to require KCOM to produce a Pricing Transparency Report and submit it to Ofcom. This will allow us to monitor KCOM's compliance with the SMP conditions imposed.

  - We are also proposing the requirement to supply retail leased lines, to not unduly discriminate and to publish a reference offer.

- *Ex ante* regulation would provide clarity to both KCOM and to the market as to the types of practices which would be regarded as compliant and non-compliant. This can be achieved through appropriately drafted SMP remedies and, given their intended clarity and transparency, would be less costly to enforce in the event that enforcement was deemed necessary.

6.66 Furthermore, in the absence of *ex ante* regulation in this retail market, KCOM could still be in a position to engage in price and non-price discrimination against its competitors in the Hull area.

6.67 Lastly, absent *ex ante* regulation, retail prices for business products are not likely to be very transparent, making it more difficult to detect undue discrimination or other anti-competitive practices.

Consultation questions

Question 6.1: Do you agree with our approach to (wholesale and retail) market definition in the Hull Area? If not, what alternative would you propose and why?

Question 6.2: Do you agree with our assessment of SMP in the markets for low bandwidth TISBO and CISBO services in the Hull Area? If not, what alternative would you propose and why?

Question 6.3: Do you agree with our assessment of SMP for the markets for low bandwidth TI and CI services in the Hull Area? If not, what alternative would you propose and why?

Question 6.4: Do you agree with our assessment of wholesale remedies not being sufficient to sustain effective competition in retail markets in the Hull Area? If not, what alternative would you propose and why?

Question 6.5: Do you agree with our finding that the three criteria test is met when applied to the retail markets in the Hull Area?

Section 7

Remedies: Approach and Structure

Introduction

7.1 In this section we set out our proposed approach to assessing what remedies are appropriate to address the competition problems we have identified in the markets in which we have provisionally concluded that BT or KCOM has SMP. We also explain why we propose to include dark fibre in the package of remedies we propose to impose on BT.

7.2 In Sections 8-13 we set out the specific regulatory obligations we propose to impose on BT in the various markets in which we have provisionally concluded that it has SMP outside the Hull area. We have structured these Sections as follows:

- Section 8 – general remedies for each of the wholesale markets;
- Section 9 – dark fibre remedy for CISBO markets;
- Section 10 – specific active remedies for the CISBO markets;
- Section 11 – specific remedies for the low-bandwidth TISBO market;
- Section 12 – remedies for interconnection and accommodation services; and
- Section 13 – remedies in relation to quality of service.

7.3 In Section 14 we set out the remedies we propose to impose on KCOM in retail and wholesale markets in the Hull area.

7.4 We intend to set out our proposals concerning charge controls in a separate consultation to be published in June 2015.

7.5 This Section covers the following:

- proposals to remove regulation;
- the competition problems that we have identified;
- insufficiency of national and Community competition law;
- regulatory framework; and
- consideration of passive remedies.

Proposals to remove regulation

7.6 Where we determine that a person to whom any SMP conditions currently apply is no longer a person with SMP in a services market, we are required by section 84(4) of the Act to revoke every SMP services condition applied to that person by reference to the market power determination made on the basis of the earlier analysis. Similarly,

where we determine that a person has no SMP in a new services market, we have no powers to impose SMP conditions on any person in such a market.

7.7 As explained in Sections 4 and 5, we propose to identify the following markets outs in which we propose that no person has SMP, namely;

- medium bandwidth TISBO in the UK excluding the Hull area;
- high bandwidth TISBO in the UK excluding the Hull area;
- wholesale regional TI trunk segments in the UK; and
- CISBO in the CLA;
- Medium bandwidth TISBO in the Hull area;
- High bandwidth TISBO in the Hull area; and
- Very high bandwidth TISBO in the Hull area.

7.8 We have published a separate consultation concerning our proposals in relation to the retail market for very low bandwidth TI leased lines in the UK excluding the Hull area, at bandwidths below 2Mbit/s.[195]

7.9 As explained above, we set out in Sections 8 to 14 the remedies we propose to address the competition problems we have identified. We are proposing to revoke the SMP services conditions currently imposed on BT and KCOM insofar as they relate to the leased lines markets which we have provisionally assessed in this market review.

7.10 We set out a draft notice revoking the SMP services conditions, together with the new SMP services conditions we are proposing in each of the relevant markets, in the draft notifications at Annex 6 to this consultation.

The competition problems that we have identified

7.11 In light of our assessment of competition in relevant markets in Sections 4 to 6 above, we have identified the following competition problems associated with our SMP findings:

- Concerns that, in the absence of appropriate *ex ante* regulation, BT and KCOM would not make access to their networks, services or associated facilities available on terms that would secure efficient investment and innovation, both in the relevant wholesale markets and in the related downstream retail markets.
- Concerns that, in the absence of appropriate *ex ante* regulation, BT and KCOM would favour their downstream retail businesses to the detriment of their competitors in the relevant retail markets (including by price - or non-price discrimination).[196]

[195] http://stakeholders.ofcom.org.uk/consultations/very-low-bandwidth/

[196] We note in this regard the proposed purchase of Everything Everywhere by BT, which is likely to increase the size of BT's downstream retail mobile business, and may therefore have an impact on

- Concerns that, in the absence of appropriate *ex ante* regulation, there is a relevant risk of adverse effects arising from BT, and KCOM, fixing and maintaining some or all prices at an excessively high level or imposing a price squeeze.

- Concerns that, in the absence of appropriate *ex ante* regulation, there is a risk that the poor quality of service offered by BT in the provision and repair of wholesale services will impact detrimentally on all downstream providers of leased lines, including BT's retail businesses, and ultimately to the detriment of end-users.

- Concerns that, in the absence of appropriate *ex ante* regulation in the relevant retail markets, KCOM would have the ability and incentive to engage in pricing and non-pricing practices to the detriment of end users.

7.12 In Sections 8 to 14, we set out in more detail why we provisionally consider that each of the remedies which make up the package of *ex ante* remedies we are proposing is based on competition problems we have identified. As set out in Article 8(4) of the Access Directive, our package of *ex ante* remedies must be based on the nature of the competition problems identified and must be proportionate and justified in light of the objectives laid down in Article 8 of the Framework Directive.

7.13 As set out in the preceding Sections, our market analysis has led us to propose that BT and KCOM have SMP in certain markets, but has also highlighted that there are some differences in competitive conditions within markets. We therefore need to exercise regulatory judgment by reference to both the nature and extent of the competition problems identified to assess the most appropriate way of addressing those competition problems in the light of the relevant objectives.

Insufficiency of national and Community competition law

7.14 Our provisional conclusion is that national and EU competition law remedies would be insufficient to address the competition problems we have identified in each of the markets in which we have provisionally found SMP.

7.15 First, we have taken account of the fact that the products in the wholesale markets we have identified are inputs into other downstream markets. Appropriate *ex ante* intervention at the upstream level can create effectively competitive downstream markets. Appropriate *ex ante* intervention at the upstream level can also facilitate the emergence of effective competition at the upstream level itself. Competition law, insofar as is relevant, prohibits the abuse of a dominant position – it does not seek to promote competition, which is one of the aims of our proposed package of *ex ante* remedies.

7.16 Secondly, the requirement to address the competition problems in each of the wholesale and retail leased lines markets means imposing an extensive package of remedies, including provisions to ensure that they remain effective during the three year review period.

7.17 For example, we are proposing both general and specific network access obligations, in the manner and form set out in draft SMP services conditions at Annex 6. These

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BT's incentives. However, we do not consider that this changes the nature of the competition concern arising from BT's SMP.

proposed conditions provide for direction-making powers, which allow us to direct BT and KCOM as to the application of both the general and specific network access obligations. This ensures that their application can be specifically tailored to address the competition problems we have identified over the course of the three year review period.

7.18 Thirdly, we are of the view that providing continued certainty on the types of behaviour that are/are not allowed in the wholesale leased lines markets is of paramount concern to BT, to other CPs, and to end users. We consider this certainty is best achieved through *ex ante* regulation. *Ex ante* regulation will also allow for timely intervention – proactively by us and/or by parties bringing regulatory disputes to us for swift resolution[197] – and, consequently, timely enforcement using the powers accorded to us under the Act to secure compliance[198] through a process with which the market in general is familiar and which is also set out in the Act.

The relationship with the BT Undertakings

7.19 In considering the sufficiency of competition law, we have also had regard to the BT Undertakings, which are in essence a remedy under national competition law, the Enterprise Act 2002. They seek to deploy a variety of mechanisms aimed at defining equivalent treatment, and at preventing and detecting discriminatory conduct by BT when supplying wholesale network access and backhaul services to its downstream competitors.

7.20 We consider that the BT Undertakings are not sufficient to address the competition problems we have identified in the various relevant markets. In particular, as we explained in 2005 when we accepted them in lieu of a reference to the Competition Commission, the BT Undertakings are intended to complement *ex ante* regulation under the Act.

7.21 We consider that the SMP remedies we are proposing in the following Sections are needed to address effectively the competition problems we have identified under this market review, including to achieve the aims prescribed by our statutory duties.

Regulatory Framework

7.22 The types of *ex ante* wholesale remedies we propose to impose are those set out in Articles 9 to 13 of the Access Directive and which are implemented into domestic law in sections 87 and 88 of the Act. They are:

- network access obligations;
- ancilliary services such as interconnection and accommodation that facilitate the use of network access;
- non-discrimination obligations;
- transparency obligations;
- price control obligations; and

[197] See sections 185 to 191 of the Act, in particular section 185(1A).
[198] See sections 94 to 104 of the Act.

- accounting separation and cost accounting obligations.

7.23 The definition of network access as set out in Article 12(1)(a) of the Access Directive encompasses both active and passive network access. Specifically, Article 12(1)(a) states that operators "may be required […] to give third parties access to specified network elements and/or facilities, including access to network elements *which are not active*…" (emphasis added).

7.24 Accordingly, we use the term 'passive remedies' to refer to access remedies which are provided without the requirement on BT to install or operate electronic equipment, and may include obligations to provide duct or pole access, or dark fibre. In contrast, the term 'active remedies' describes access remedies which include in addition to the underlying infrastructure the provision of transmission equipment for the conveyance of the signals.

7.25 We set out in Section 2 and Annex 14 the legal framework for this review, but we set out below some obligations that we consider are particularly relevant to our assessment of remedies.

7.26 In considering what remedies to propose under section 87(3) we are required to take into account, in particular, those factors set out in section 87(4) namely:

- the technical and economic viability (including the viability of other network access products, whether provided by the dominant provider or another person), having regard to the state of market development, of installing and using facilities that would make the proposed network access unnecessary;

- the feasibility of the provision of the proposed network access;

- the investment made by the person initially providing or making available the network or other facility in respect of which an entitlement to network access is proposed (taking account of any public investment made);

- the need to secure effective competition (including, where it appears to OFCOM to be appropriate, economically efficient infrastructure based competition), in the long term;

- any rights to intellectual property that are relevant to the proposal; and

- the desirability of securing that electronic communications services are provided that are available throughout the member States.

7.27 We must also act in accordance with following requirements:

- A requirement to promote competition in relation to, amongst other things, the provision of electronic communications networks and electronic communications services (section 4(3) of the Act).

- A requirement to encourage the provision of network access and service interoperability for the purpose of securing efficiency and sustainable competition, efficient investment and innovation and the maximum benefit for the persons who are customers of communications providers (section 4(7) and (8) of the Act).

7.28 We also note from our general duties (section 3(4) of the Act) our obligations to have regard to (amongst other things):

- 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 UK.

7.29 In relation to conditions relating to network access pricing, section 88(1) of the Act provides these should appear to us to be appropriate for the purposes of promoting efficiency, promoting sustainable competition and conferring the greatest possible benefits on end-users.

7.30 We therefore take all of these considerations into account in our provisional assessment in Sections 8 to 14 below, including in relation to our assessment of passive remedies, and our assessment requires us to balance these considerations (and others), exercising our regulatory judgment.

7.31 In particular, when we take account of considerations relating to investment, we consider it appropriate to consider the effect on investment both at the infrastructure level and at the level of provision of active services. In turn, we weight these impacts on investment against considerations relating to the promotion of competition in relevant markets, in particular at the downstream level.

7.32 Similarly, when considering efficiency, we take account of three types of efficiency:

- allocative efficiency, which is achieved when prices are close to cost, ensuring that all consumers who value a product at more than its cost are able to purchase it;
- productive efficiency, which is achieved when the costs of production are minimised; and
- dynamic efficiency, meaning that firms have the correct incentives to invest and to innovate.

7.33 Section 91 of the Act confers on us the power to impose SMP conditions on operators which we have found to have SMP in a relevant retail market. The sorts of SMP conditions we may impose include those authorised or required by sections 87 and 88. Section 91 also states that retail SMP conditions may only be imposed where, in our view, it appears that the imposition of SMP conditions in the relevant wholesale market(s) would not enable us to perform, or fully perform, our duties under section 4 of the Act in relation to the situation in the retail market as revealed by our analysis of that market. We set out in Section 14 how we consider we have satisfied this test in respect of the regulation we propose for the retail markets identified in Hull.

Consideration of passive remedies

Introduction

7.34 We considered whether to impose passive remedies in the 2013 Review and concluded that it would not be appropriate to include passive remedies as part of that market review. We therefore imposed a package of active remedies.

7.35 In this market review we are again considering whether passive remedies should form part of the package of remedies we impose. We raised the issue in the April 2014 CFI and issued a preliminary consultation on passive remedies (the November 2014 Passives Consultation). We set out below our provisional overall assessment of the case for passive remedies in this market review. This takes into account the responses received to the April 2014 CFI, the November 2014 Passives Consultation, and other submissions made by stakeholders. Our detailed analysis of those responses, and of the case for passive remedies, is set out in Annexes 23 to 27.

7.36 We first note that a passive remedy would take some time to implement.[199] In addition, BT, CPs and end-users of leased lines would need time to adjust to any changes brought about by any introduction of passive remedies, including developing products, operating processes and systems, and migrating end-users' services from current products. Consequently, CPs would continue to rely on active remedies during this review period and probably beyond.

7.37 In considering whether to impose passive remedies we therefore proceed on the basis that any passive remedies we impose would co-exist with active remedies for at least this review period. Accordingly, for the purpose of this market review, we have considered the relative merits of a package of remedies that includes both passive and active remedies compared with an approach based on active remedies only.

7.38 The time taken for implementation and adoption by the industry also means that the impacts of passive remedies, if we impose them in this review, would arise mainly beyond the 2016-2019 review period. We consider that in relation to the assessment of passives it is particularly important for us to consider effects over the long term. We are required to consider the need to ensure effective competition in the long term under the regulatory framework summarised above.

Summary of our current assessment of passive remedies

7.39 We propose to include dark fibre in the package of remedies because:

i) a package of remedies including passive remedies can offer substantial benefits relative to imposing active remedies only;

ii) whereas we recognise that imposing passive remedies would also carry substantial risks, the pricing of passive access would determine the balance between benefits and risks;

iii) we are able to propose a dark fibre remedy priced in a way that we consider would achieve a good balance between delivering substantial benefits while mitigating the risks, and better than the balance achievable between benefits, costs and risks associated with duct access (whether imposed in addition to or instead of dark fibre); and

iv) we consider that the balance of benefits and risks associated with the dark fibre remedy we have designed is such that a package of remedies including both active and passive access would be a more appropriate means of addressing the

[199] We discuss the time it would take BT to implement a dark fibre remedy in Section 9.

competition problems in the relevant markets than a package of remedies including active access only.

7.40 We set out our reasoning to support our proposal in the paragraphs that follow.

Passive remedies can offer substantial benefits relative to active remedies

7.41 We have reviewed the potential benefits of passive remedies, and set this out in Annex 23. We conclude provisionally that:

- in relation to dynamic efficiencies, passive remedies would offer CPs more scope for innovation and differentiation of their services than active remedies alone, both in the form of technical solutions and features, enabled by independent choice of equipment, and in the form of greater responsiveness to end-users' needs, enabled by more direct control over operational activities such as upgrades and configuration of services;[200]

- in relation to productive efficiencies, passive remedies could provide CPs with opportunities to reduce duplication of equipment, reducing overall equipment costs; and

- passive remedies could allow us to simplify regulation in future if sufficiently vigorous competition based on passives is established over time to reduce the need to impose active remedies.

7.42 We consider that CPs are likely to take up regulated passive access in pursuit of opportunities for innovation, differentiation and reductions in overall equipment costs. In Annex 27 we provide details of formal requirements for new product developments to Openreach which have either been cancelled or rejected, which individual CPs may have been able to pursue if passive remedies had been available. We also provide examples of the different technologies adopted by CPs with their own infrastructure, which may be adopted more widely if passive remedies were available.

7.43 Although it would be practicable for BT to realise some innovations in the form of solutions based on active remedies, we consider that passive remedies would confer a dynamic efficiency advantage of allowing each CP to decide independently whether, how and when to proceed with such developments, rather than requiring Openreach and CPs to coordinate.

7.44 We consider that regulated duct access could deliver the following benefits over and above those of dark fibre:

- allow CPs to deploy infrastructure for additional services alongside leased lines; and

- provide an infrastructure component which could help a CP to assemble fibre networks in cities in the form of rings rather than in BT's "tree-and-branch" architecture.

[200] For example, the deployment of LTE-Advanced mobile networks means that demand for solutions alternative to those currently offered by Openreach to deliver high-capacity is likely to grow. With passive remedies, individual CPs could make their own decisions about whether to deploy a technology such as Cloud Radio Access Networks (C-RAN) and when to deploy it, independently of the views and development timescales of BT.

7.45 We recognise that duct access could also allow CPs direct control over the process of installation of fibre cables in BT's ducts, and therefore potentially allow CPs better control over the quality of service provisioning. However, the extent of any benefit which could result to end-users is not clear. We note, in particular, that CPs installing fibre cables in BT's ducts would be subject to some of the same factors that affect Openreach's quality of service provisioning, such as street work restrictions, way-leaves and duct construction lead-times.

Imposing passive remedies would also carry substantial risks

7.46 As noted above, any passive remedies we may impose would need to co-exist with active remedies during the review period and probably beyond. We therefore analyse the risks that can arise from imposing passive remedies in the context of co-existence. Annex 24 sets out our analysis of the risks and impacts, and the table below summarises its provisional conclusions.

Table 7.1: Summary of the impacts and risks of introducing passive remedies

	Description	Scale and scope of risk
Dynamic efficiency	The introduction of a new upstream remedy could reduce the investment incentives of BT and non-BT infrastructure operators relative to an active-only regime, by affecting future build-buy decisions and undermining returns on existing investments. However, the remedy could promote investment in the use of passive access.	Highly dependent on i) the design of any passive remedy, and ii) the extent to which the passive remedy replicates the benefits of self-build.
Allocative efficiency and distributional impacts	Passive remedies are likely to result in some rebalancing of active prices, which is likely to create winners and losers among different customers depending on services typically purchased. This could create distributional concerns.	It is unlikely that a passive remedy could be introduced in a way which would have no distributional effects, but its design is likely to be able to reduce any negative impacts while also minimising the risk to BT's common cost recovery.
Productive efficiency	The existence of passive remedies (and any coexistence with active remedies) could distort the investment signals at different levels of the value chain, leading to inefficient entry.	If passive prices can be set appropriately (both in absolute terms, and relative to active prices if remedies coexist), it is not clear that the risk of inefficient entry would be significant.
Structure of competition in the market	To the extent that economies of scale and long term commitments are more important to a CPs ability to utilise passive remedies than actives, it has been suggested that introducing the former could result in market consolidation, with smaller CPs exiting the market and reducing the extent of competition.	While the remedy may have an impact on the downstream market, providing it is fit for purpose we consider it unlikely that this impact will be large, and in any event it is not clear that this will necessarily be for the worst, given the greater opportunities that passives may open up.
Implementation costs	BT will likely incur some costs as part of developing and implementing a new remedy.	It seems these are unlikely to be significant, particularly since there are likely to be ways to limit them.[201]

[201] In Section 9 we consider the costs which BT could incur in developing dark fibre access.

The balance between benefits and risks would be determined by the type of passive access and by the approach to its pricing

7.47 The relative pricing of active and passive remedies would be a key driver of how and where passive remedies are used, and of their ultimate impact on competition and consumers.

7.48 In Annex 26 we explain our provisional analysis of the effect of different approaches to pricing dark fibre on incentives to invest in infrastructure, on arbitrage opportunities and on potential distributional impacts on different end-users.

Addressing risks of inefficient entry

7.49 While passive and active access co-exist, regulated passive access could present CPs with arbitrage opportunities, which are pricing signals potentially inconsistent with economically efficient choices. In line with our duties relating to the promotion of efficiency, we consider that the design of any passive access we propose should seek to avoid giving rise to arbitrage opportunities which could incentivise inefficient entry. Avoiding such arbitrage opportunities would require the price differences faced by CPs to be consistent with economic efficiency in all instances of choice between passive and active access. The arbitrage opportunities would arise in circumstances in which it would be impractical to vary the price of a passive product to reflect the price of the corresponding active alternative, according to the nature or number of services for which it is used.[202]

7.50 We consider that one type of arbitrage opportunity could relate to bandwidth, because, in our view, it would be impractical to vary the price of a passive access product according to the bandwidth of the service for which it is used. An arbitrage opportunity could therefore arise if differences between BT's charges for active products of different bandwidths were to exceed the corresponding differences in their incremental costs. Such a bandwidth gradient of pricing is a feature of some of BT's current charges, allowing BT to recover more of its common costs from higher-bandwidth products than from lower-bandwidth ones.

7.51 We consider that if we were to impose a passive remedy, BT is likely to seek to minimise this type of bandwidth-related arbitrage opportunities by rebalancing its prices, within the constraints of any charge control we impose. Our current view is therefore that the risk of inefficient entry posed by this type of arbitrage opportunity is likely to be small. Rebalancing of BT's charges is likely to give rise to other risks and impacts, which we discuss further below.

7.52 Another type of arbitrage opportunity could relate to geographic density of demand, and could arise if it were possible for a CP to provide several active services using a single instance of the passive product. We consider that this type of arbitrage opportunity would arise particularly with duct access rather than dark fibre. BT currently charges the same price for an active wholesale product between two particular locations irrespective of the number of other products it provides either to the same locations and/or to other locations in the vicinity. Regulated dark fibre would not necessarily undermine this approach to charging, because, like an active service, a dark fibre product would only provide access between two specific

[202] We note that, in seeking to avoid creating arbitrage opportunities, our goal is not necessarily to protect all aspects of the current pricing structure of BT's active products, but rather to avoid incentivising inefficient entry based solely on arbitrage between incompatible pricing structures.

locations. However, regulated access to BT's duct would allow a CP to lay cables with many fibres, which it could use to provide several fibre connections, to any particular location and/or to several different locations in the same vicinity.[203] In our view, it would be impractical to seek to address this type of arbitrage opportunity by varying the price of a duct access product according to the number of services for which it is used.

7.53 In principle, we could seek to mitigate the risk posed by such geographic density arbitrage opportunities by setting a relatively high price for passive access, but this would reduce the likely use of passive access to districts with high density of demand, particularly city centres. This could be dealt with by de-averaging the price of duct access geographically, charging lower access prices in locations with lower density of demand. However, doing so would require a major change to our approach to regulation and to the current structure of access pricing. The overall impacts on the market would be difficult to predict, and could be negative.

7.54 A further arbitrage opportunity could relate to the distance between served locations. The structure of charges for BT's wholesale active products includes elements which vary with circuit length as well as elements which do not. A passive access product with a different charge structure in respect of circuit length could give rise to arbitrage opportunities.

7.55 For example, the charges for Openreach's Ethernet local access leased line product, EAD Local Access, do not vary with the distance of the end-user's site from the serving exchange. A dark fibre product charged solely on a per-metre basis could incentivise access seekers to decide to use passive access to serve end-users close to the exchange, while using EAD Local Access to serve end-users further away. The decisions between dark fibre and EAD Local Access incentivised by this pricing structure for dark fibre would be likely to bear little if any relationship to economic efficiency: for any given distance, the underlying costs of the fibre in the two options are likely to be equal. Rather, a per-metre price would lead to arbitrage based on incompatible pricing structures. As we are considering passive remedies in the context of co-existence of both active and passive access products, we wish to avoid arbitrage driven solely by incompatible pricing structures between the two products.

7.56 We consider that the risk of inefficient entry posed by such arbitrage opportunities could be mitigated by designing the structure of prices of passive access to reflect the relationship between price and circuit length in the structure of BT's charges for active services.

Addressing the risk of undermining BT's investment incentives

7.57 In the case of a dark fibre remedy, we consider that we could minimise the risk of undermining BT's investment incentives by designing any control of BT's charges for active services appropriately. Specifically, we could take account of the availability of dark fibre in designing a charge control to ensure that, if BT rebalances its prices in response to the imposition of dark fibre, it would continue to have an opportunity to recover its efficiently incurred costs, including common costs.

7.58 Pricing dark fibre on an 'active-minus' basis, such that the difference in price between dark fibre and a reference active product reflects the difference in their incremental

[203] Figure 24.1 in Annex 24 illustrates the difference between potential density-based arbitrage opportunities arising from duct access and dark fibre

costs, would ensure that the contribution to BT's common costs made by purchase either of dark fibre or of the reference active product would be the same. If BT rebalances its charges to bring the differences in price between the reference active product and products higher in bandwidth into line with their respective incremental costs, then the contribution made by the higher bandwidth products to recovery of BT's common costs would also be the same.

7.59 The costs BT would be allowed to recover under the charge control would include its cost of capital, and its incentives to invest should therefore not be affected by imposition of dark fibre.

7.60 With duct access it would at best be very difficult to preserve BT's pattern of cost recovery as described for dark fibre, as we cannot predict accurately what impact duct access might have on BT's volumes, revenues and costs. For example, if there was large scale take-up of a regulated duct access product to deliver high-margin circuits in dense urban areas, the impact on BT's cost recovery would be much greater than if a similar volume of the same duct access product was used to serve areas where BT did not yet have a fibre network.

Mitigating the risk of undermining other CPs' incentives to invest in infrastructure

7.61 Passive remedies would allow CPs to use regulated access to BT's network to compete in downstream markets more effectively. On the other hand, we recognise that by imposing passive remedies on BT we might reduce CPs' incentives to invest in alternative fibre infrastructure. CPs such as Virgin and CityFibre are contesting BT's SMP in some parts of the leased lines markets by investing in such infrastructure, and we therefore consider it important to limit the extent to which any passive remedies we propose could undermine their incentives.

7.62 To the extent that other CPs' costs of investing in infrastructure match or undercut BT's, in addressing the risk of undermining BT's investment incentives we would also partially address the risk of undermining their investment incentives.

7.63 However, if BT reduces its charges for some of its higher bandwidth products in response to the imposition of a passive remedy, other CPs are also likely to reduce charges for services of similar bandwidths delivered using their own infrastructure. Their incentives to provide high-bandwidth services in cases which involve new investment in extending their physical networks are therefore likely to be reduced.

7.64 The higher the bandwidth of the reference active product we choose in 'active-minus' pricing of dark fibre, the more we would mitigate the extent to which their incentives would be reduced.

7.65 For the reasons noted above regarding our inability to predict the impact of duct access on BT's recovery of its common costs, we would be equally unable to predict what impact duct access might have on CPs' incentives to invest in their own infrastructure, with an associated risk of negative consequences for competitive infrastructure providers.

Mitigating distributional impacts

7.66 The charge controls we impose on BT are generally designed to bring its revenues into line with costs over the review period by requiring BT to reduce its charges progressively. The controls also typically allow BT some flexibility to apply different reductions to different products.

7.67 If BT rebalances its charges in response to the imposition of dark fibre priced on an 'active-minus' basis, it is likely to apply larger reductions to charges for products higher in bandwidth than the reference product and either smaller reductions (or even increases) to charges for products lower in bandwidth.

7.68 Bandwidth-related rebalancing of charges could therefore give rise to distributional impacts, in which users of higher bandwidth products would benefit from price reductions to a greater extent than users of lower bandwidth products. Although distributional impacts are not necessarily a concern *per se*, nonetheless there may be concerns if dark fibre resulted in a substantial shift in the pattern of BT's cost recovery from large enterprises, MNOs and LLU operators, which tend to use higher bandwidth products, to smaller enterprises, which tend to use lower bandwidth ones. Moreover, there may be a loss of allocative efficiency if the (relatively) higher prices for low bandwidth products caused total output to fall.

7.69 The pricing approach we propose - a dark fibre product using a higher bandwidth reference active product for 'active minus' pricing - would give rise to less substantial distributional (and so allocative efficiency) impacts than if it were linked to the price of a lower bandwidth one.

7.70 In the discussion of the risks of inefficient entry, we noted that imposing duct access could lead to geographic de-averaging of charges. We also noted and that we would not be able to predict accurately the impacts of such de-averaging on BT's volumes, revenues and costs. For the same reasons, we consider that we would be unable to predict the impact of duct access on BT's recovery of its common costs, and that we would therefore not be able to mitigate the distributional impacts of duct access effectively.

Consideration of duct access

7.71 We have considered whether any passive remedies we may impose should include duct access, dark fibre or both. On the basis of the considerations set out above, our provisional view is that a package of remedies which includes a dark fibre remedy would provide a better balance between the benefits and risks than a package that includes a duct access remedy, or a package that includes both duct access and dark fibre. There are four main reasons for this.

7.71.1 Firstly, we consider that duct access is likely to deliver fewer benefits than dark fibre, because there is likely to be less take-up of duct access than of dark fibre. However, it is possible that duct access imposed alongside dark fibre could offer some additional benefit, such as providing an infrastructure component which could help CPs assemble fibre rings in city centres. The potential benefit that duct access could enable CPs to invest in fibre in parts of the country which may be underserved by BT is likely to be less relevant to leased lines than to residential broadband, because BT currently offers fibre leased lines anywhere in the UK, subject to excess construction charges.[204]

7.71.2 Secondly, we consider that with a duct access remedy we would not be able to mitigate the risks described above as effectively as with a dark fibre remedy.

[204] Excess construction charges are regulated charges for construction of any infrastructure required specifically to serve a particular end-user.

7.71.3 Thirdly, we consider that dark fibre would use BT's infrastructure more efficiently than duct access. This would be true at least to the extent that CPs would use duct access to lay their fibre cables alongside BT's cables, which could contain substantial capacity of unused fibres.

7.71.4 Finally, whilst we acknowledge that a duct access remedy could potentially deliver additional benefits, we consider that with a dark fibre remedy, which could deliver the key benefits of innovation, differentiation and opportunities to reduce duplication of equipment, we could achieve a better balance overall as the risks can be more effectively mitigated.

7.72 We therefore do not propose a package of remedies that includes duct access.

7.73 We have considered separately whether the possible future existence of a form of duct access under the EU Civil Infrastructure Directive (CID) would address our competition concerns sufficiently that it would not be proportionate to impose a dark fibre or duct access SMP remedy at all. For the same reasons given at Annex 13 (paragraphs A13.10-A13.13), where we explain why we do not consider that the CID materially affects our market power assessment, we also do not consider that we can rely on the CID to address effectively the competition concerns arising from such market power.

Dark Fibre remedy design and pricing

7.74 For the reasons set out in detail in Annex 26, we consider that a dark fibre remedy with an 'active-minus' pricing approach (in which passive access charges are set at the price of an active service minus the relevant incremental costs attributable to the active service) would provide the best balance between the benefits and the risks identified.

7.75 In particular, we consider that dark fibre products priced on this basis by reference to the EAD/EAD Local Access 1Gbit/s active products, with dark fibre variants of both EAD and EAD Local Access, and with the same charge structure in respect of circuit length as their corresponding active products, would optimise this balance between benefits and risk. We also consider that the distributional impacts and impacts on allocative efficiency which could result from this choice of reference product, through any relative upward rebalancing of prices for lower bandwidth services, are not likely to be substantial.

Our assessment and proposal to impose dark fibre

7.76 On the basis of the reasoning set out above, we consider that it is possible to design a dark fibre remedy to deliver substantial benefits relative to active remedies alone, while mitigating the risks, including those risks which would arise from imposing it alongside active remedies.

7.77 We consider that the balance between benefits, risks and costs which imposing duct access could achieve, either in addition to or instead of dark fibre, would be less favourable.

7.78 We therefore consider that a package of remedies including dark fibre would be a more appropriate way to address the competition problems we have identified than an approach based solely on active remedies.

7.79 Accordingly, we conclude that it is appropriate to propose the imposition of a passive dark fibre remedy in this market review. We set out in Section 9 the specific remedies that we propose in relation to dark fibre access, with further proposals in relation to pricing to be set out in our forthcoming June 2015 Leased Lines Charge Control Consultation.

7.80 We note here that the proposed dark fibre remedy affects the design of the active remedies we propose for CISBO markets, and is also relevant to our charge control proposals. We discuss the effects on our design of the active remedies in Section 8, in particular from 8.65 to 8.69 and from 8.188 to 8.195. Details of the impacts on our proposed design of the charge control will be set out in the June 2015 Leased Lines Charge Control Consultation.

7.81 As we discuss in Section 14, we are not proposing to impose passive remedies on KCOM in view of the low level of demand for wholesale leased lines in the Hull area and the lack of demand for a passive remedy there. In the absence of clear demand for a specific type of wholesale product, there is a risk that it would not be used or that it would not meet CPs' requirements if demand were to arise at a later date. In view of these circumstances we propose that a general obligation to provide network access on reasonable request, enabling CPs to request wholesale services as and when required, is a proportionate response to the competition problems we have identified in the wholesale markets in the Hull area.

Consultation questions

Question 7.1: Do you agree with our approach to assessing what remedies are appropriate to address the competition problems we have identified in the markets in which we propose to find that BT and KCOM have SMP? If not, please explain why, and what alternative approach you consider we should take.

Question 7.2: Do you agree with our assessment of the benefits that a package of passive and active remedies can offer relative to a package of active remedies only? If not, please explain why, giving your views on our assessment of these benefits, and providing any relevant evidence in support.

Question 7.3: Do you agree with our assessment of the risks associated with imposing passive remedies? If not, please explain why, giving your views on our assessment of these risks, and providing any relevant evidence in support.

Question 7.4: Do you agree that our proposal of a dark fibre remedy priced and designed in the way we have described in this consultation provides the best balance between the benefits and risks that we have identified? If not, please explain why, providing any relevant evidence in support, referencing specific aspects of our proposed passive remedy design where appropriate, and taking into account any comments you have made in response to questions 7.2 and 7.3.

Question 7.5: Do you agree with our assessment of passive remedies, and our proposal to include dark fibre in the package of remedies we propose to impose on BT? If not, please explain why.

Section 8

General Remedies for wholesale leased lines markets

Introduction

8.1 In this section we set out the general SMP remedies we propose to impose on BT in the following wholesale leased lines markets:

- wholesale market for low bandwidth Traditional Interface Symmetric Broadband Origination (TISBO) in the UK excluding the Hull area, at bandwidths up to and including 8Mbit/s;
- wholesale market for Contemporary Interface Symmetric Broadband Origination (CISBO) in the London Periphery area (LP); and
- wholesale market for Contemporary Interface Symmetric Broadband Origination (CISBO) in the Rest of the UK (RoUK) excluding the Hull area.

8.2 The remedies we are proposing to impose on KCOM in the Hull area are set out in Section 14.

8.3 By general remedies, we mean those that apply generally to address the competition problems associated with SMP across each of the wholesale leased lines markets (in particular network access, non-discrimination and various transparency requirements).

8.4 These remedies form part of the overall package of remedies that we are proposing for these markets, which also includes: obligations to provide specific types of wholesale leased line, a dark fibre remedy, quality of service remedies and accommodation and interconnection obligations. Our proposals concerning these additional obligations are set out in subsequent sections of this consultation.

8.5 The general remedies apply to forms of network access that BT offers in this market, including the dark fibre remedy we are proposing. Where relevant, we explain in this section where we think a different approach is appropriate for the dark fibre remedy and where we consider that it is appropriate to adjust the general remedies in light of the proposed dark fibre remedy.

8.6 These proposed SMP remedies are based on the nature of the competition problems we have identified in our market analysis, in particular our SMP assessment, in these markets. We summarise these competition problems in Section 7.

8.7 We consider that these remedies would achieve our statutory duties and would satisfy the relevant legal tests. In reaching these proposals, we have also taken account of our regulatory experience from the two previous market reviews, recent developments in these markets, views expressed by stakeholders in response to our April 2014 CFI, and expected developments over the course of the review period of three years.

Summary of proposals

8.8 Table 8.1 summarises the general remedies that we propose to impose on BT in each wholesale market.

Table 8.1: Summary of proposed general remedies for BT by wholesale market

Wholesale market	Proposed general remedies
Low bandwidth TISBO in the UK excluding the Hull area	– Requirement to provide network access on reasonable request – Requirements relating to requests for new forms of network access – Requirement not to discriminate unduly – Price control – Requirement to publish a reference offer – Requirement to notify changes to charges terms and conditions – Requirement to notify technical information – Accounting separation – Cost accounting
CISBO in the London Periphery Area and CISBO in the RoUK excluding the Hull area	– Requirement to provide network access on reasonable request – Requirements relating to requests for new forms of network access – Requirement not to discriminate unduly and Equivalence of Inputs – Price control – Requirement to publish a reference offer – Requirement to notify changes to charges terms and conditions – Requirement to notify technical information – Accounting separation – Cost accounting

8.9 We propose to make some changes relative to the 2013 Review:

- Amendments to the price controls, as discussed in more detail in this section.
- The removal of the requirement for BT to send Ofcom copies of Reference Offers, notifications of changes to charges, terms and conditions, and notifications of changes to technical information.
- An amendment to the requirement for BT to publish Reference Offers and notifications of changes to technical information on its website to require the information to be publically accessible, i.e. not requiring password access.
- The removal of the requirement for BT to include in its Reference Offers and notifications of changes to charges, terms and conditions the amount applied to each network component with the relevant usage factors for each network

component or combination of such components, reconciled in each case to the charge payable by a CP.

- The addition of the requirement for BT to include in its Reference Offers an Initial Contractual Delivery Date.
- A new accounting separation obligation to reflect the changes to the framework for BT's regulatory financial reporting that we set out in the 2014 Regulatory Reporting Statement.[205]

Assessment of appropriate remedies

8.10 In this subsection, we set out our proposed general remedies for the wholesale leased lines markets. We assess each proposed general remedy in turn by setting out:

- any existing requirements;
- any relevant stakeholder input or recent developments;
- the aim and effect of the proposed regulation;
- our proposals, including our consideration of relevant stakeholder input; and
- our initial consideration of the relevant legal tests for imposing the proposed regulation.

Interconnection and accommodation services

8.11 In order to use the wholesale services that BT provides in these markets CPs also require certain interconnection and accommodation services. To achieve an overall solution we consider that it is necessary to regulate the provision of these ancillary services, in the absence of which, we consider BT would have an incentive to refuse to supply or to supply in a discriminatory manner, for example by charging excessive prices.

8.12 Network access is defined in sections 151(3) 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. Consequently, each of the obligations that we propose below for these markets also applies to the provision of interconnection and accommodation services that are reasonably required by CPs in connection with the provision of the regulated services.

8.13 In Section 12 we discuss the specific types of interconnection and accommodation services that we are proposing that BT should be required to provide.

[205] http://stakeholders.ofcom.org.uk/binaries/consultations/bt-transparency/statement/financial-reporting-statement-may14.pdf

Requirement to provide network access on reasonable request

Current remedies

8.14 BT is currently required to provide network access on reasonable request and to provide such access as soon as it is reasonably practicable and on fair and reasonable terms, conditions and charges or such other terms, conditions and charges we may from time to time direct.

Aim and effect of the regulation

8.15 As our analysis in the preceding sections show, the level of investment required by a third party to replicate BT's network and build sufficiently large access networks to compete 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 is fundamental to promoting competition in downstream markets. We consider that, in the absence of such a requirement, BT would have both the incentive and ability to refuse access at the wholesale level thereby favouring its own retail operations. This would hinder sustainable competition in the corresponding downstream markets, ultimately against end-users' interests.

Our proposals

8.16 Section 87(3) of the Act authorises Ofcom to set SMP services conditions requiring the dominant provider to provide such 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. Section 87(9) of the Act also authorises SMP services conditions imposing on the dominant provider such rules as they may make in relation to matters connected with the provision of network access about the recovery of cost and cost orientation, subject to the conditions of Section 88 being satisfied.

8.17 We are proposing to impose an SMP obligation requiring BT to provide network access where a third party reasonably requests it in respect of each of the wholesale leased lines markets in the UK (excluding the Hull area) in which we are proposing to find that BT has SMP.

8.18 The proposed condition, which replicates the current SMP condition, will require BT to provide network access on fair and reasonable terms, conditions and charges. We consider that the general network access obligation should be supported by a fair and reasonable charges obligation for the following reasons.

8.19 Firstly, we consider that these obligations are needed to complement the charge controls and non-discrimination obligations to address effectively the risk that BT may seek to impose a margin squeeze, or to otherwise act anti-competitively in setting its prices. In this respect, we would not consider that such prices are 'fair and reasonable'. This approach is consistent with the Access Guidelines[206], which note that:

[206] Imposing access obligations under the new EU directives, Oftel, 13 September 2002, available at http://www.ofcom.org.uk/static/archive/oftel/publications/ind_guidelines/acce0902.pdf

> "…'fair and reasonable' [would require], amongst other things, that terms and conditions under which products are offered are consistent with those which would be offered in a competitive market, sensible, practical, and do not impose a margin squeeze on competitors."[207]

8.20 In relation to margin (or price) squeeze, the Access Guidelines note, in particular, that a vertically integrated operator may have an incentive to put pressure on competitors by reducing the margin between the wholesale and the retail price to the point where it is not sufficient to cover the relevant measure of retail costs.[208] They further note that protection against that type of behaviour may be achieved by imposing a non-discrimination obligation and that charges which created a margin squeeze would not be fair and reasonable. In the light of this, we consider that a fair and reasonable pricing obligation would address our concerns that BT could set charges for these wholesale leased lines services in a way that may raise doubt as to whether these charges would be unduly discriminatory, but which pricing behaviour nonetheless amounts to (or has similar effects to) margin squeeze.

8.21 Secondly, we consider that imposing fair and reasonable pricing obligations would also serve the purpose of providing appropriate protection in relation to products or services, existing and new, falling outside the scope of the charge controls we are proposing to impose.

8.22 In proposing fair and reasonable pricing obligations on BT, we have also had regard to our objective of providing certainty in relation to the proposed charge controls. We do not consider that the attainment of this objective is jeopardised by proposing fair and reasonable pricing obligations. These obligations are not intended to impose any additional constraint on the maximum charges that BT may levy, such as a lower ceiling than those permitted by the charge controls.

8.23 We propose that it is appropriate for this SMP condition to include the power for Ofcom to make directions in order that we can secure the supply of services and, where appropriate, fairness and reasonableness in the terms, conditions and charges for providing third parties with network access. The proposed condition includes a requirement for the dominant provider to comply with any such direction(s), so any contravention of a Direction would constitute a contravention of the condition itself and would therefore be subject to enforcement action under sections 94-104 of the Act.

Legal tests

8.24 For the reasons set out above and summarised below, we are satisfied that that the proposed condition (as set out in Annex 6) meets the relevant tests set out in the Act.

8.25 Section 87(3) of the Act authorises the setting of an SMP services condition requiring the dominant provider to provide such 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.

[207] See paragraph 3.39.
[208] See paragraph 3.34.

8.26 When considering the imposition of such conditions in a particular case, we must take into account six factors set out in Section 87(4) of the Act, including *inter alia*:

- the technical and economic viability of installing and using other facilities, including the viability if other network access products whether provided by the dominant provider[209] or another person[210], that would make the proposed network access unnecessary;
- the feasibility of the proposed network access;
- the investment made by the person initially providing or making available the network or other facility in respect of which an entitlement to network access is proposed (taking account of any public investment made); and
- the need to secure effective competition, including where it appears to us to be appropriate, economically efficient infrastructure based competition, in the long term.

8.27 In proposing the general requirement for the provision of network access, we have taken all these six factors into account.

8.28 The definition of access and the way in which we might assess reasonable demands for access are set out in our Access Guidelines.[211] We consider it is appropriate in cases where we propose a CP has SMP (such as BT in this case) to impose an access obligation on that provider requiring it to meet all reasonable requests for network access within the relevant wholesale market, irrespective of the technology required, on fair and reasonable terms, conditions and charges.

8.29 As discussed in our SMP assessment in sections 4 and 5, there are considerable sunk costs associated with building networks to provide leased lines services. We consider it is unlikely to be economically viable or efficient to build competing access networks on a sufficient scale to provide effective constraint on BT's SMP in the downstream markets.

8.30 Therefore, we are currently of the view that a requirement for BT to provide general network access is appropriate. It facilitates competition in downstream markets by enabling CPs to compete without the need to invest in a network, an investment which we consider, on the basis of our market analysis, represents a structural barrier to entry and expansion in the leased lines markets.

8.31 Consequently, we consider these requirements are necessary for securing effective competition, including economically efficient infrastructure based competition, in the long term. The requirements for BT only to meet reasonable network access requests also ensures that due account is taken of the technical and economic viability of installing and using other facilities, the feasibility of the proposed network access, and of the investment made by BT initially in providing the network.

8.32 We consider that this proposal meets our duties under sections 3 and 4 of the Act. We consider that the imposition of a network access obligation promotes competition in relation to the provision of electronic communications networks and services,

[209] In this instance, BT
[210] i.e. other CPs
[211] See footnote 206

ensuring the provision of network access and service interoperability for the purposes of securing efficient and sustainable competition and the maximum benefit for the persons who are customers of CPs. This is because the imposition of the obligation would ensure that BT offers the wholesale products required by other CPs to compete effectively in the downstream markets.

8.33 With regard to the Community requirements set out in section 4 of the Act, we believe that the proposed condition meets the requirements. Specifically, we believe section 4(8) is met, where the obligation has the purpose of securing efficient and sustainable competition in the markets for electronic communications networks and services, by helping to ensure that other CPs can continue to compete effectively in the downstream retail markets by using wholesale products offered by BT.

8.34 Section 47(2) of the Act requires conditions and directions respectively to be objectively justifiable, non-discriminatory, proportionate and transparent. The proposed conditions and directions are:

- objectively justifiable, in that they facilitate and encourage access to BT's network and therefore promote competition to the benefit of consumers;
- not unduly discriminatory, as they are proposed only for BT and no other CP has been found to hold a position of SMP in these markets;
- proportionate, since they are targeted at addressing the market power that we propose BT holds in these markets and do not require it 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 provides access to its networks in order to facilitate effective competition.

8.35 For the reasons set out above, we consider that the proposed conditions are appropriate to address the competition concerns identified, in line with section 87(1) of the Act.

The BEREC Common Position

8.36 We have also taken utmost account of the BEREC Common Position in formulating our proposals including BP5 and BP36 which appear to us to be particularly relevant in this context.[212] We consider that our proposals are consistent with the best practice set out in the BEREC Common Position.

Requests for new forms of network access

Current remedies

8.37 BT is currently subject to an obligation that sets out detailed requirements on the handling of requests for new types of network access. It requires BT to publish guidelines specifying the content and form of requests and how they will be handled;

[212] BoR (12) 126, *BEREC common position on best practice in remedies imposed as a consequence of a position of significant market power in the relevant markets for wholesale leased lines*, 26 November 2012, http://berec.europa.eu/files/document_register_store/2012/11/BoR_(12)_126_Draft_WLL_CP_2012.11.26.pdf.

to provide guidance to CPs on drafting reasonable product specifications; and sets out timescales within which BT must acknowledge and process requests.

8.38 Openreach's Statement of Requirements (SoR) process is the mechanism through which BT meets the BCMR new access request conditions for CISBO services. BT Wholesale has a separate SoR process for TISBO services.

Developments since the 2013 Review and stakeholder comments

8.39 In their responses to the CFI, TalkTalk and Vodafone raised concerns about Openreach's product development process. TalkTalk said that Openreach routinely rejects developments that are in consumers' interests but not BT's. Vodafone said that BT only seems to deliver timely responses to SoRs submitted by BT or which are of obvious and immediate commercial advantage to BT. Both considered that the SoR process should be revised. TalkTalk put forward ideas on how the product development process can be improved to better work in consumers' interests including making it clear that Openreach should assess SoRs on the basis of their benefits to consumers' and ensuring timely and transparent decisions.

8.40 A number of CPs also raised concerns about the SoR process during the Fixed Access Market Review 2014 (FAMR 2014). They complained Openreach was not responsive to requests and called for Ofcom to actively monitor compliance and/or to more closely prescribe the process.

8.41 In the 2014 FAMR Statement, we noted that CP concerns were not restricted to FAMR markets and related also to the same or similar new network access conditions in other markets including wholesale leased lines markets. [213] We therefore considered that the concerns were best addressed in a wider context. We decided to closely monitor the SoR process across all relevant regulated markets over the next 12 months in order to gain a better view of the concerns that stakeholders had raised. Our intention was to collect information on SoRs as they progress through the process and attend working groups where SoRs are discussed. The monitoring programme is now in progress. Once it is completed we will decide whether it is appropriate to initiate a separate SoR project.

8.42 The Equality of Access Board (EAB) is responsible for oversight of the Undertakings. The EAB's Annual Report 2014[214] noted improvements in transparency in relation to SoRs. However, it remains concerned about the throughput and delivery rate, particularly for new Ethernet requirements. No formal complaints were made by CPs to the EAB in 2013/14, although the Equality of Access Office (EAO) did receive three 'informal complaints' regarding Ethernet services. Openreach, the EAO and the Office of the Telecoms Adjudicator (OTA2) jointly review the status of SoRs every month. Ofcom observes these discussions and we also participate with Openreach, the EAO and the OTA2 in monthly reviews of SoRs that closed in that month, to check that procedures have been followed and the SoRs have been correctly closed.

[213] Paragraph 10.118, Ofcom, *Fixed access market reviews: wholesale local access, wholesale fixed analogue exchange lines, ISDN2 and ISDN30 - Volume 1: Draft statement on the markets, market power determinations and remedies*, 19 May 2014, http://stakeholders.ofcom.org.uk/binaries/telecoms/ga/fixed-access-market-reviews-2014/draftstatement/volume1.pdf

[214] BT Group Equality of Access Board, *Annual Report 2014*, 22 May 2014, https://www.btplc.com/Thegroup/Ourcompany/Theboard/Boardcommittees/EqualityofAccessBoard/Publications/EAB_Annual_Report_2014.pdf.

Aim and effect of the regulation

8.43 In the absence of regulation, vertically integrated operators have the ability to favour their own downstream business over third party CPs by differentiating on price or terms and conditions. One form of discrimination is in relation to the handling of requests for new types of network access. This has the potential to distort competition at the retail level by placing third party CPs at a disadvantage compared with the downstream retail business of the vertically integrated operator in terms of their ability to introduce new services to meet their customer needs and in terms of their ability to offer innovative services in order to compete more effectively.

8.44 We consider that obligations specifying how requests for new types of network access should be handled can mitigate the risk of this type of discrimination.

Our proposals

8.45 The concerns raised by stakeholders about the SoR process echo those raised in the FAMR. We therefore consider that, in the first instance, they are best addressed by our monitoring programme instigated in the FAMR. We are currently conducting the SoR monitoring work discussed above. When this work is completed in summer 2015 we will decide whether further work is required to address the concerns.

8.46 In the meantime, we propose to retain the current requirements on requests for new network access. We consider that this requirement remains an appropriate and proportionate *ex ante* measure to complement the general network access requirement discussed in the preceding sub-section.

8.47 Whilst acknowledging the concerns about the current arrangements we consider that the new network access obligations, together with the obligation not to discriminate unduly provide a clear framework under which BT must operate, including timescales for BT's response to development requests. The Access Guidelines also provide further guidance concerning requests for new product developments.[215] Concerns about specific product development requests that cannot be addressed satisfactorily through industry fora or in cooperation with the OTA2 can be escalated to Ofcom through the disputes and complaints process.

Legal tests

8.48 For the reasons set out above and summarised below, we are satisfied that the proposed condition (as set out in Annex 6) meets the relevant tests set out in the Act.

8.49 Section 87(3) authorises the setting of a SMP condition 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 the times required by or under the conditions.

8.50 In reaching our proposal, we have taken into account the factors set out in section 87(4) of the Act:

[215] *Oftel, Imposing access obligations under the new EU Directives,* 13 September 2002, www.ofcom.org.uk/static/archive/oftel/publications/ind_guidelines/acce0902.pdf.

- The technical and economic viability, having regard to the state of market development, of installing and using facilities that would make the proposed network access unnecessary;
- The feasibility of the provision of the proposed network access;
- The investment made by the person initially providing or making available the network or other facility in respect of which an entitlement to network access is proposed;
- The need to secure effective competition in the long term;
- Any rights to the intellectual property that are relevant to the proposal; and
- The desirability of securing that electronic communications services are provided that are available throughout the Member States.

8.51 In particular, we consider that the SMP condition specifying how BT should handle requests for new network access is required to order to ensure that BT does not discriminate in favour of its own downstream business. The proposed obligation achieves this by:

- requiring BT to publish reasonable guidelines specifying the required content and form of requests for new network access and how they will be handled;
- requiring BT to provide sufficient technical information to CPs to allow them to draft product specifications that are efficient and which satisfy the reasonable requirements; and
- specifying timescales within which BT must acknowledge and process requests.

8.52 We have considered our duties under the Act, including our general duties under section 3 and all the community requirements set out in section 4. We note, in particular, that the proposed condition is aimed at promoting competition in downstream markets, by ensuring that access seekers are able to make requests for new forms of network access based on an agreed SoR process.

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

- Objectively justifiable in that its purpose is to support the non-discrimination obligations in the processing of requests for new network access;
- Not unduly discriminatory, as it applies to BT only, in the markets where we have provisionally found it to have 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
- Transparent in that the condition is clear in its intention to set requirements for the processing of requests for new network access.

8.54 For the reasons set out above, we consider that the proposed conditions are appropriate to address the competition concerns identified, in line with section 87(1) of the Act.

The BEREC Common Position

8.55 We have also taken utmost account of the BEREC Common Position including BP6 which appears to us to be particularly relevant in this context.[216] We consider that our proposals are consistent with the best practice set out in the BEREC Common Position.

Requirement not to discriminate unduly and Equivalence of Inputs (EOI)

Current remedies

8.56 BT is currently prohibited from discriminating unduly in relation to the provision of network access in each of the wholesale leased lines markets.

Aim and effect of the regulation

8.57 Article 8(1) of the 2002 EC Directive on access to, and interconnection of, electronic communications networks and associated facilities (the Access Directive)[217] requires Member States to ensure that national regulatory authorities are empowered to impose certain obligations where an operator is designated as having SMP. These include, under Article 10 of the Access Directive, obligations of non-discrimination. Article 10(1) provides that a national regulatory authority may: "*impose obligations of non-discrimination, in relation to interconnection and/or access*". Article 10(2) further provides:

> "[o]bligations of non-discrimination shall ensure, in particular, that the operator applies equivalent conditions in equivalent circumstances to other undertakings providing equivalent services, and provides services and information to others under the same conditions and of the same quality as it provides for its own services, or those of its subsidiaries or partners".

8.58 Article 10 of the Access Directive is implemented into UK law by section 87(6)(a) of the Act which gives us a power to impose "a condition requiring the dominant provider not to discriminate unduly against particular persons, or against a particular description of persons, in relation to matters connected with network access to the relevant network or with the availability of the relevant facilities". We consider any conditions imposed pursuant to this power require equivalence as per Article 10(2).

8.59 A non-discrimination obligation is intended as a complementary remedy to the network access obligation, principally to prevent the dominant provider from discriminating in favour of its own downstream divisions and to ensure that competing providers are placed in an equivalent position. Without such an obligation, the dominant provider is incentivised to provide the requested wholesale network access service on terms and conditions that discriminate in favour of its own

[216] BoR (12) 126, see footnote 7 above.
[217] EC, Directive 2002/19/EC of the European Parliament and of the Council of 7 March 2002 on access to, and interconnection of, electronic communications networks and associated facilities, www.eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2002:108:0007:0020:EN:PDF.

downstream divisions. For example, BT may decide to charge its competing providers more than the amount charged to its own downstream units or it might strategically provide the same services but within different delivery timescales. Both these behaviours could have an adverse effect on competition.

8.60 Non-discrimination can have different forms of implementation. A strict form of non-discrimination – i.e. 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 CP's own downstream divisions) would be provided on a truly equivalent basis, an arrangement which has become known as EOI. An EOI obligation removes any degree of discretion accorded to the nature of the conduct. The concept of EoI was first identified in the Strategic Review of Telecoms in 2004/05 as one of our key policy principles to ensure that regulation of the telecommunication markets is effective. Following on from this review, a specific form of EOI was implemented in 2005 by means of the BT Undertakings.

8.61 On the other hand, a less strict implementation of non-discrimination may allow for flexibility and result in a more practical and cost-effective implementation of wholesale inputs in cases where it is economically justified. As part of this review, we have considered what form of non-discrimination obligation would be appropriate in each of the wholesale leased lines markets.

Our proposals

The wholesale low bandwidth TISBO market in the UK excluding the Hull area

8.62 In the case of wholesale low bandwidth TISBO market, we do not consider it proportionate to require EOI. BT's current wholesale services for TI are Partial Private Circuits (PPCs), and an EOI requirement for PPCs would entail a major re-engineering of BT provisioning systems and processes. This would be disproportionate given that the TI market is declining and on a forward-looking basis PPC users will move to other products, including Ethernet-based leased lines.

8.63 We therefore consider that a less strict implementation is appropriate for the wholesale TISBO market and propose imposing an SMP Condition prohibiting BT from discriminating unduly. Under this condition BT would be required to ensure that any discrimination is not undue, and we propose to interpret this obligation in accordance with our guidelines of November 2005 on Undue discrimination by SMP providers (the Discrimination Guidelines).[218] We consider that undue discrimination in particular would occur where, in the absence of objective justification:

- BT was to refuse to reflect relevant differences between (or was to refuse to reflect relevant similarities in) the circumstances of customers in the transaction conditions it offers; and
- BT was to discriminate between internal and external wholesale customers.

[218] See http://stakeholders.ofcom.org.uk/consultations/undsmp/contraventions/

The wholesale CISBO market in the Rest of the UK excluding the Hull area

8.64 In this market, we believe it is appropriate to require that CISBO services are delivered to competitors on an EoI basis. This is because:

- CISBO products are upstream inputs to two major retail telecommunications markets – the broadband market and the retail CI leased lines market. Our wholesale regulation must aim at ensuring there is a level playing field for competitors in both these markets. The availability of wholesale inputs on an EoI basis would seek to prevent BT engaging in discriminatory practices that could adversely affect competition and ultimately cause detriment to citizens and consumers;

- prohibiting undue discrimination while stopping short of EoI could result in BT providing competitors with a different set of products to those it provides to itself, potentially using different processes and systems for their development, delivery, maintenance and repair. While this may not be unduly discriminatory (depending on the precise circumstances), it would fall short of true equivalence and could undermine effective competition. For example, it may act as an impediment to improved products being made available equally promptly to BT and to its competitors. It is therefore necessary, in our view, to require provision on an EoI basis in addition to the prohibition of undue discrimination;

- Openreach CISBO services are still subject to further product development and quality enhancements and we consider EoI consumption provides the right incentives on BT to implement the changes and make better product variants available to both its downstream divisions and competitors. Discrimination in favour of downstream divisions is not necessarily related to setting different prices for the same wholesale inputs. There are other forms of discrimination which are often referred to as non-price discrimination. Without EoI, the dominant provider may be incentivised to supply products with different levels of quality – e.g. different SLAs and SLGs, providing fault repair of products on different timescales, creating new variants to fulfil the requirements of its downstream division, and taking longer to address, or avoiding addressing, the requirements of its competitors. All these aspects are crucial to compete in the CISBO leased lines markets and we consider EoI can address any such potential issue; and

- As a result of BT's commitments in the Undertakings, it is BT's current practice to supply CISBO circuits on an EoI basis by means of its access division Openreach. We therefore consider that imposing a very similar requirement in the market review would not be onerous as it would not require BT to re-engineer existing systems and processes.

The wholesale CISBO market in the London Periphery

8.65 The considerations set out above are also applicable to the wholesale CISBO market in the London Periphery and absent other considerations indicate that EOI is the most appropriate form of non-discrimination obligation for this market. We have, however, had regard to the fact that currently the provision of MISBO services (equivalent to very high CISBO) is not regulated in the WECLA (which closely equates to the CLA and the London Periphery). Also, we expect that in future the dark fibre remedy we propose will be the main vehicle for competition for very high bandwidth services. In view of this we consider that it would not be proportionate to apply an EOI obligation to very high CISBO services, as when dark fibre becomes available, it may mean that such EOI obligations would be no longer needed. We

consider that it would be disproportionate to introduce a new remedy which may no longer be needed within a relatively short time after its introduction.

8.66 These considerations do not apply to lower bandwidth CISBO services in the London Periphery (i.e. low, mid and high CISBO). These services currently fall within the wholesale AISBO market in the WECLA and are subject to ex-ante regulation including an EOI obligation. We also expect that to a significant extent, competition will continue to be based on the use of active remedies. Consequently we consider that EOI is the most appropriate form of non-discrimination obligation for these services.

8.67 In summary, we propose that in the wholesale CISBO market in the London Periphery, BT should be subject to:

- An EOI obligation for the provision of low, mid and high CISBO (i.e. single service Ethernet services at bandwidths up to and including 1Gbit/s); and
- A non-discrimination obligation for the provision of very high CISBO (i.e. single service Ethernet services at bandwidths above 1Gbit/s and WDM services).

Form of non-discrimination obligation for the proposed dark fibre remedy

8.68 As we discuss in more detail in Section 9, we are proposing to impose a dark fibre remedy in the wholesale CISBO market in the LP and the wholesale CISBO market in the RoUK excluding the Hull area.

8.69 In Section 8 we have also set out our consideration of how the non-discrimination obligation would operate for the dark fibre remedy.

Amendments to EOI definition to reflect changes to CI core boundary

8.70 In light of our proposed changes to the definition of the CI core market discussed in section 4, we are proposing to amend the exemption to the EOI obligation that applies to certain Backhaul Segments. Our proposed revised market definition adds additional BT exchanges and competitive data centres to the existing Trunk Aggregation Nodes (TANs) in an expanded CI core market. As explained in Section 10, we are proposing to use the term “Competitive Core Node” to describe a node which is either a TAN or a Data Centre Core Node. Hence, we propose to amend Condition 4 such that BT is not required to provide network access on an EOI basis from Backhaul Segments that connect BT’s 21 “Core Nodes” with Competitive Core Nodes (rather than TANs). The proposed amendment is set out in Annex 6.

8.71 We have also considered our position in relation to various types of discount that BT might offer and whether any changes are required to the undue discrimination obligation to address particular types of discounts.

Volume discounts

8.72 We recognise that volume discounts would very often in practice constitute undue discrimination, since BT’s retail arm would almost inevitably be the main beneficiary and there is therefore a strong potential for anti-competitive effects. Nevertheless, we do not consider a change in the obligation is required specifically to reflect this as we believe that this point is well understood by BT and CPs.

Geographic discounts

8.73 As discussed in sections 4 and 5, we have conducted a detailed geographic analysis of each of the retail and wholesale product markets. On the basis of this analysis, we note that for the geographic markets where we have found SMP, the underlying costs and competitive conditions will not be completely homogenous throughout the UK.

8.74 This suggests that some freedom to charge in a way that reflects more accurately the costs incurred and to respond to the local characteristics of competition that exist in these markets could be efficient. Moreover, given the level of cost differences that may exist and the extent of competition in some areas, BT's ability to compete could be limited if it were required to maintain nationally uniform prices. Hence, geographically differentiated prices may reflect BT responding legitimately to cost differences in the face of competition.

8.75 We therefore consider that geographic discounts may or may not be unduly discriminatory depending on the circumstances. In the event of an allegation of offering unduly discriminatory geographic discounts, we would judge each alleged breach of the no undue discrimination obligation on a case by case basis.

8.76 In the June 2015 LLCC Consultation we will consider how geographic discounts should be treated in the proposed charge controls.

Term discounts

8.77 In principle, we consider this form of discount could raise competition concerns, for example:

- if BT's downstream operations were at an advantage compared to downstream competitors. In principle, the largest beneficiary of term discounts could be BT's downstream operations, as they may see no commercial disadvantage in being contractually tied to BT's wholesale services for a lengthy period of time. If so, it could provide BT with the ability to undercut downstream competitors in ways that they could not match (where those competitors rely on wholesale services from BT, but do not wish to sign up to the discounts).

- term discounts may increase the barriers to entry/growth for upstream competitors to Openreach, if purchasers of wholesale services are tied into longer term contracts (and so increasing the switching costs).

8.78 It is not necessarily the case, however, that we should automatically view all forms of term discount as harmful to consumers. It is common commercial practice for customers to commit to longer terms in exchange for lower rental charges. Such arrangements can benefit both supplier and customer, particularly in cases where there are significant upfront costs to be recovered.

8.79 We therefore consider term discounts may or may not be unduly discriminatory depending on the circumstances. In the event of an alleged breach we would judge each alleged breach on a case by case basis.

8.80 In the June 2015 LLCC Consultation we will consider how term discounts should be taken into account in the price control.

Legal tests

8.81 For the reasons set out above and summarised below, we are satisfied that the proposed conditions (as set out in Annex 6) meet the relevant tests set out in the Act.

8.82 We consider 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.

8.83 We have also 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 preventing BT from leveraging its SMP into downstream markets.

8.84 Section 47 of the Act requires conditions to be objectively justifiable, non-discriminatory, proportionate and transparent. The proposed conditions are:

- objectively justifiable in that they provide safeguards to ensure that competitors, and hence consumers, are not disadvantaged by BT discriminating unduly in favour of its own downstream activities or between different competing providers;
- not unduly discriminatory in that they are proposed only for BT and no other operator has been found to hold a position of SMP in these markets;
- proportionate in that they only seek to prevent undue discrimination; and
- transparent in that the conditions are clear in what they are intended to achieve.

8.85 For the reasons set out above, we consider that the proposed conditions are appropriate to address the competition concerns identified, in line with section 87(1) of the Act.

The BEREC Common Position

8.86 We have taken utmost account of the BEREC Common Position in formulating our proposals including BP8, BP10 and BP10a which appear to us to be particularly relevant in this context.[219] We consider that our proposals are consistent with the best practice set out in the BEREC Common Position.

Transparency and notification obligations

8.87 We propose that BT should be subject to a set of obligations designed to promote transparency, reduce the risk of undue discrimination and ensure that CPs are able to make effective use of the dominant provider's network access. The obligations which are discussed in more detail below are:

- a requirement to publish a Reference Offer;
- a requirement to notify of changes to charges, terms and conditions in advance; and

[219] BoR (12) 126, see footnote 7 above.

- a requirement to notify of changes to technical information in advance.

Requirement to publish a Reference Offer

Current remedies

8.88 BT is currently required to publish a Reference Offer (RO) in relation to the provision of network access. The RO must set out (at a minimum) such matters as the terms and conditions for provisioning, technical information, SLAs and SLGs, and availability of co-location. This obligation also prohibits BT from departing from the charges, terms and conditions set out in the RO. It also requires BT to comply with any directions Ofcom may make from time to time under the condition.

Aim and effect of the regulation

8.89 A requirement to publish an RO has two main purposes:

- 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.

8.90 This helps to ensure stability in markets as, without it, incentives to invest might be undermined and market entry less likely.

8.91 The publication of an RO would potentially allow for quicker 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.

Our proposals

8.92 Section 87(6)(c) of the Act authorises the setting of SMP services conditions requiring the dominant provider to publish, in such a manner as Ofcom may direct, the terms and conditions on which it is willing to enter into an access contract. Section 87(6)(d) also permits the setting of SMP services conditions requiring the dominant provider to include specified terms and conditions in an access contract. Finally, section 87(6)(e) permits the setting of SMP services conditions requiring the dominant provider to make such modifications to the reference offer as may be directed from time to time.

8.93 We consider that the requirement to publish ROs imposed in previous markets reviews has been effective in meeting the aims of the regulation detailed above. Therefore, we propose that BT should be required to publish an RO for wholesale network access products in each of these wholesale markets.

8.94 The proposed condition requires the publication of an 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 published RO must set out (as a minimum) such matters as:

- a clear description of the services on offer including technical characteristics and operational processes for service establishment, ordering and repair;
- the locations of points of network access and the technical standards for network access;
- conditions for access to ancillary and supplementary services associated with the network access including operational support systems and databases etc.;
- contractual terms and conditions, including dispute resolution and contract negotiation/renegotiation arrangements;
- charges, terms and payment procedures;
- service level agreements and service level guarantees; and
- to the extent that BT uses the service in a different manner to CPs or uses similar services, BT is required to publish a reference offer in relation to those services.

8.95 We consider that imposing a requirement to publish an RO is necessary to achieve these aims and effects in each of these wholesale markets where we provisionally find BT to hold SMP. This remedy complements our proposals to impose network access and non-discrimination requirements on BT to address the competition concerns arising from their SMP in each of these wholesale markets.

8.96 The proposed obligation includes the following amendments to the Condition currently in force:

- We propose removing the requirement for BT to include in its RO an amount applied to each network component with the relevant usage factors for each network component or combination of such components, reconciled in each case to the charge payable by a CP. We no longer consider that this information is required in order to assist CPs in monitoring potential discriminatory behaviour by BT, or to provide transparency that would allow CPs to make better informed purchasing decisions. This is a change we have already made in other markets, namely the fixed narrowband services markets[220] and the fixed access markets.[221]
- As BT publishes ROs on its website, we have removed the requirement for BT to send copies of its ROs to Ofcom. Alongside this amendment, we have specified that BT must publish its ROs on *publically available* websites, i.e. those that do not require password access, to ensure full transparency for other CPs and ourselves.

[220] Ofcom, *Review of the fixed narrowband services markets: Statement on the markets, market power determinations and remedies*, 26 September 2013, http://stakeholders.ofcom.org.uk/binaries/consultations/nmr-2013/statement/Final_Statement.pdf, paragraphs 5.369, 6.172 and 10.123.

[221] Ofcom, *Fixed access market reviews: wholesale local access, wholesale fixed analogue exchange lines, ISDN2 and ISDN30: Volume 1: Statement on the markets, market power determinations and remedies*, 26June 2014, http://stakeholders.ofcom.org.uk/binaries/telecoms/ga/fixed-access-market-reviews-2014/statement-june-2014/volume1.pdf, paragraph 10.250

- For the reasons set out in Section 13 on Quality of Service we are proposing to impose minimum performance standards on Openreach including a requirement regarding the percentage of Ethernet orders which Openreach must complete by the initial contractual delivery date it provides to its customers. We are therefore proposing to add 'the provision of an Initial Contractual Delivery Date' to the list of information BT must include in its ROs in order to expressly require that BT provides its customers with an initial delivery date.

Legal tests

8.97 For the reasons set out above and summarised below, we are satisfied that the proposed condition (as set out in Annex 6) meets the relevant tests set out in the Act.

8.98 We consider that the proposed condition satisfies our duties under section 3, and all the Community requirements set out in section 4, of the Act.

8.99 The requirement to publish an RO will, in combination with a requirement not to discriminate and/or discriminate unduly, facilitate service interoperability and allow CPs to make informed decisions about future entry into the relevant market. Further, the obligation will enable buyers to adjust their downstream offerings in competition with BT in response to changes in BT's terms and conditions. Finally, the obligation will make it easier for Ofcom and other CPs in the relevant market to monitor any instances of discrimination. Therefore, we consider that the condition in particular furthers the interests of consumers in relevant markets by promoting competition in accordance with section 3 of the Act.

8.100 We also consider that the condition meets the Community requirements set out in section 4 of the Act. In particular, the condition promotes competition and encourages the provision of network access and service interoperability for the purpose of securing efficiency and sustainable competition for the maximum benefit for consumers. The publication of an RO will mean that other CPs will have the necessary information readily available.

8.101 Section 47 of the Act 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, provide stability in markets and allow monitoring of anti-competitive behaviour;

- not unduly discriminatory in that it is proposed only for BT and no other operator has been found to hold a position of SMP in these markets;

- proportionate in that only information that is considered necessary to allow providers to make informed decisions about competing in downstream markets is required to be provided; and

- transparent in that it is clear in its intention to ensure that BT publishes details of its service offerings.

8.102 Article 9(4) of the Access Directive requires that where network access obligations are imposed, NRAs shall ensure the publication of a reference offer containing at least the elements set out in Annex II to that Directive – we are satisfied that this requirement is met.

8.103 For the reasons set out above, we consider that the proposed conditions are appropriate to address the competition concerns identified, in accordance with section 87(1) of the Act.

The BEREC Common Position

8.104 In forming these proposals we have also taken utmost account of the BEREC Common Position including BP16, BP22 and BP23 which appear to us to be particularly relevant in this context.[222] We consider that our proposals are consistent with the best practice set out in the BEREC Common Position.

Requirement to notify of changes to charges, terms and conditions

Current remedies

8.105 BT is currently required to give advanced notice before making changes to its charges or terms and conditions for the provision of existing or new network access in each of the wholesale leased lines markets.

Aim and effect of the regulation

8.106 Notification of changes to charges at the wholesale level has the joint purpose of assisting transparency for the monitoring of potential anti-competitive behaviour, and giving advance warning of charge changes to competing providers who buy wholesale access services. The latter purpose ensures 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. Notification of changes therefore helps to ensure stability in markets, without which incentives to invest might be undermined and market entry made more difficult.

8.107 There may be some disadvantages to notifications, particularly in markets where there is some competition. It can lead to a ‘chilling’ effect where other CPs follow BT’s prices rather than act dynamically to set competitive prices. We do not consider, on balance, that this consideration undermines the rationale for imposing a notification of charges condition.

8.108 Each of the wholesale leased lines markets in the UK (excluding the Hull area) is characterised by a high level of reliance by competitors on the provision of wholesale access products and services to enable them to compete in downstream markets. The investment required to use wholesale leased line services is significant and requires CPs to build more complex networks than for most of the services in other regulated markets to which we have applied a 28 day notice period. In this market there is also often a longer / more complex supply chain of network operators, resellers and systems integrators supporting multiple downstream services. This means that changes to wholesale leased line services are likely to have a greater impact on CPs than changes to downstream services where we apply a 28-day notice period and will also be more complex to assess. Typically this might involve modelling the impact of the new charges on the cost of providing downstream services, securing internal approval for a pricing revisions and finally notifying end-users (which may be subject to a minimum notice period, typically 28 days). With a shorter notification period, there is a risk that CPs would have insufficient time to react to changes to wholesale terms and could for instance be left financially

[222] BoR (12) 126, see footnote 7 above.

exposed by changes to wholesale prices. We therefore consider that the advantages of notifying charges are likely to outweigh any potential disadvantages.

8.109 In certain circumstances it may also be appropriate to require the notification of changes to terms and conditions where this will also ensure transparency and provide advanced warning of changes, in order to allow competing providers sufficient time to plan for them. Again, this assists in providing stability in markets, without which incentives to invest might be undermined and market entry made more difficult.

8.110 This remedy complements the network access and non-discrimination requirements on dominant providers to address the competition concerns arising from a position of SMP in the wholesale leased lines markets.

Our proposals

8.111 Section 87(6)(b) of the Act authorises the setting of SMP services conditions which require a dominant provider to publish, in such manner as Ofcom may direct, all such information, for the purpose of securing transparency. Section 87(6)(d) also permits the setting of SMP services conditions requiring the dominant provider to include specified terms and conditions in change notices.

8.112 We propose to re-impose the obligation on BT to notify of changes to its charges, terms and conditions. We refer to these notifications as ‘change notices’. We propose that the following notification periods should apply:

- 28 days’ notice for prices, terms and conditions relating to new service introductions;
- 28 days’ notice for price reductions and associated conditions (for example, conditions applied to special offers); and
- 90 days’ notice for all other changes to prices terms and conditions.

8.113 In deciding to retain these notifications periods, we have considered the following relevant factors:

i) In relation to the 90-day period for changes to existing services, the investment required to use wholesale leased line services is significantly greater and requires CPs to build more complex networks than for most of the services in other markets to which we have applied the same notification requirement with a 28-day notice period.

ii) Wholesale leased line services support multiple downstream services. This means that changes to wholesale leased line services are likely to have a greater impact on CPs than changes to downstream services and will also be more complex to assess. Typically this might involve modelling the impact of the new charges on the cost of providing downstream services, securing internal approval for a pricing revision and notifying end-users (which may be subject to a minimum notice period, typically 28 days).

iii) Too short a notification period would risk that CPs would have insufficient time to react to changes to wholesale terms and could, for instance, be left financially exposed by changes to wholesale prices.

iv) There should be no risk of financial exposure for CPs when prices are reduced, so a 28-day notification period is appropriate.

8.114 The proposed condition includes the following amendments to the condition currently in force:

i) We propose, as we did in the 2013 Narrowband Consultation and in the 2013 Fixed Access Market Review Consultation, removing the requirement on BT to include in its change notices an amount applied to each network component with the relevant usage factors for each network component or combination of such components, reconciled in each case to the charge payable by a CP. We no longer consider that this information is required in order to assist CPs in monitoring potential discriminatory behaviour by BT, or to provide transparency that would allow CPs to make better informed purchasing decisions.

ii) As BT publishes change notices on its website, we have removed the requirement for BT to send copies of change notices to Ofcom.

Legal tests

8.115 For the reasons set out above and summarised below, we are satisfied that the proposed condition (as set out in Annex 6) meets the relevant tests set out in the Act.

8.116 We considered that the proposed condition satisfies 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. This is achieved by ensuring that CPs have the necessary information about changes to terms, conditions and charges sufficiently in advance to allow them to make informed decisions about competing in downstream markets.

8.117 Section 47 of the Act 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;
- not unduly discriminatory, as it is proposed only for BT and no other operator has been found to hold a position of SMP in these 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 would be sufficient for new network access and price reductions; and
- transparent in that it is clear in its intention to ensure that BT provides notification of changes to their charges and terms and conditions.

8.118 For the reasons set out above, we consider that the proposed conditions are appropriate to address the competition concerns identified, in line with section 87(1) of the Act.

Requirement to publish quality of service information

8.119 BT is currently subject to a requirement to publish such quality of service information that Ofcom may from time to time direct. In view of our proposal to impose a new condition concerning quality of service (as set out in Section 13) we are not proposing to re-impose this condition.

Requirement to notify of changes to technical information

Current remedies

8.120 BT is currently subject to a requirement to publish, in advance, changes to technical information in each of the wholesale leased lines markets.

Aim and effect of the regulation

8.121 Complementary to the requirement to publish a RO, which includes technical information, the aim of this regulation is to provide advanced notification of changes to technical characteristics. This is to ensure that CPs have sufficient time to respond to changes that may affect them. For example, a CP may need to introduce new equipment, or modify existing equipment or systems, to support a new or changed technical interface. Similarly, a CP may need to make changes to their network in order to support changes in the points of network access or configuration.

8.122 We consider this remedy is important in each of the wholesale leased lines markets to ensure that CPs who compete in downstream markets are able to make effective use of existing or, where applicable, new wholesale services provided by BT. Technical information therefore 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).

8.123 The existing condition requires the notification of new technical information within a reasonable period of time but not less than 90 days in advance of providing new wholesale services or amending existing technical terms and conditions.

8.124 The requirement to give notification within a reasonable time period may mean that a period of notification in excess of 90 days may also be appropriate in certain circumstances. For example, if BT was to make a major change to its technical terms and conditions, a period of more than the 90 day minimum notification period may be necessary in order to enable competing providers, who purchase effected wholesale services, sufficient time to prepare and support such changes without disruption and detriment to their businesses and customers.

Our proposals

8.125 Section 87(6)(b) of the Act authorises the setting of SMP services conditions which require a dominant provider to publish, in such manner as Ofcom may direct, all such information, for the purpose of securing transparency. Section 87(6)(d) also permits the setting of SMP services conditions requiring the dominant provider to include specified terms and conditions in a notice of changes to technical information.

8.126 We consider the requirement to notify technical information imposed as a result of the 2013 Review has been effective in allowing providers sufficient time to prepare for such changes. Therefore, we consider it is appropriate to re-impose the same

requirement in this market review. We refer to these notifications as 'technical change notices'.

8.127 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. We consider 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. As noted above, longer periods of notification may also be appropriate in certain circumstances.

8.128 The proposed condition includes two amendments to the condition currently in force. As BT publishes technical change notices on its company website, we have removed the requirement for BT to additionally send copies of the notices to Ofcom. We have also added a requirement for BT to publish any technical change notice on *publically available* websites, i.e. those that do not require password access, to ensure full transparency for other CPs and ourselves.

Legal tests

8.129 For the reasons set out above and summarised below, we are satisfied that the proposed condition (as set out in Annex 6) meets the relevant tests set out in the Act.

8.130 We consider that the proposed conditions satisfy 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 ensuring that providers have sufficient notification of technical changes to TISBO services to enable them to compete in downstream markets.

8.131 Secondly, section 47 of the Act requires conditions to be objectively justifiable, non-discriminatory, proportionate and transparent. The proposed condition 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 only for BT and no other operator has been found to hold a position of 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 notify changes to technical information in advance.

8.132 For the reasons set out above, we consider that the proposed condition is appropriate to address the competition concerns identified, in line with section 87(1) of the Act.

Requirements for cost accounting

Current remedies

8.133 BT is currently subject to cost accounting obligations.

Aim and effect of the regulation

8.134 Cost accounting obligations require the dominant provider to maintain a cost accounting system (a set of processes and systems) to capture the costs, revenues, assets and liabilities associated with the provision of services and to attribute them in a fair, objective and transparent manner to individual services in order that the costs of individual services may be determined. The imposition of cost accounting obligations on dominant providers is an important means of ensuring that:

- we have the necessary information to support the monitoring of the effectiveness of pricing remedies, in particular to ensure that the pricing remedies we impose continue to address the competition problems identified and to enable our timely intervention should such intervention ultimately be needed;
- wholesale costs are attributed across the wholesale markets (and the individual services within them) in a consistent manner. This mitigates in particular against the risk of double recovery of costs or that costs might be loaded onto particular products or markets;
- publication (i.e. reporting) of cost accounting information aids transparency, providing reasonable confidence to stakeholders about compliance with SMP obligations, allowing stakeholders to monitor compliance and more generally enabling stakeholders to make better informed contributions to the development of the regulatory framework; and
- BT records all information necessary for the purposes listed above at the time that relevant transactions occur, on an ongoing basis. Absent such a requirement, there is a strong possibility that the necessary information would not be available when it is required and in the necessary form and manner.

Our proposals

8.135 Section 87(9) to (11) (subject to section 88) of the Act authorises 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 fair and reasonable charges, charge controls, the recovery of costs and basis of charges obligations. We propose to impose cost accounting requirements on BT in each of the wholesale leased lines markets in which we propose that it is has SMP. We consider that this obligation is necessary to ensure the appropriate maintenance of accounts in order to monitor BT's activities with regard to the pricing remedies we propose in each of these markets.

8.136 In the 2014 Regulatory Reporting Statement[223] we set out our conclusions on the regulatory financial reporting policy that should be applied to BT across all regulated markets and the changes to the framework for BT's regulatory financial reporting. In Annex 2 to the 2014 Regulatory Reporting Statement we set out a pro-forma SMP conditions which implemented our decisions made in that statement. The new SMP conditions were imposed in the Fixed Access and WBA markets following our reviews of those markets in 2014. In light of this, in making our proposals regarding

[223] http://stakeholders.ofcom.org.uk/binaries/consultations/bt-transparency/statement/financial-reporting-statement-may14.pdf

cost accounting, we are proposing to impose these SMP conditions in each of the wholesale leased lines markets in which we propose BT has SMP.

8.137 We refer to the 2014 Regulatory Financial Reporting Statement in which we set out our reasoning and decisions on the specific form of the cost accounting and accounting separation requirements we are proposing for BT in these markets.

8.138 In addition, in the 2015 Directions Statement[224] we set out the necessary directions to give effect to other decisions made in the 2014 Regulatory Reporting Statement about changes to BT's reporting requirements[225]. The new directions were imposed in the Fixed Access and Wholesale Broadband Access (WBA) markets. In line with that approach, we are proposing to issue these directions under the proposed SMP conditions subject to making any necessary changes to reflect our proposals and ultimately decisions in relation to the wholesale leased lines markets. We note that certain reporting requirements contained in some of these directions have already been subject to consultation.[226]

8.139 We outline below our proposals for charge controls, although the form, scope and level of the charge control will be considered fully in the June 2015 LLCC Consultation and will be subject of further consultation through that process. In light of the fact that any cost accounting requirements are closely related to the charge control, our views on what specific cost accounting requirements we propose are appropriate to complement these pricing remedies will also be set out in the June 2015 LLCC Consultation, and will be consulted on as part of that process.[227]

Legal tests

8.140 For the reasons set out above and summarised below, we are satisfied that the proposed condition (as set out in Annex 6) meets the various tests set out in the Act.

8.141 We have considered our statutory obligations and the Community requirements set out in sections 3 and 4 of the Act. In particular, we consider that the imposition of the proposed cost accounting obligations is justifiable and proportionate to promote competition in relation to the provision of electronic communications networks and services and to ensure the provision of network access (including supporting ancillary services) and service interoperability for the purpose of securing efficient and sustainable competition and the maximum benefit for the persons who are customers of CPs. This is because the imposition of the obligation will ensure that other obligations designed to curb potentially damaging leverage of market power – in particular the setting of prices at excessive levels – can be effectively monitored and enforced.

8.142 We have considered the Community requirements set out in section 4 of the Act and believe that the proposed cost accounting obligations in particular promote competition in relation to the provision of electronic communications networks and encourage the provision of network access for the purpose of securing efficiency and

[224] http://stakeholders.ofcom.org.uk/binaries/consultations/financial-reporting/statement/statement.pdf
[225] These directions were set out in Annexes 1 to 8 to the 2015 Directions Statement.
[226] This applies to the directions specifying: (i) the Regulatory Accounting Principles; (ii) transparency requirements; (iii) audit requirements; and (iv) requirements relating to reconciliation report.
[227] Such proposals may require modifications of the directions in relation to: (i) requirements in relation to consistency with regulatory decisions and the RAV; (ii) additional reporting of information relating to BT's adjusted financial performance; (iii) requirements in relation to preparation, delivery, publication, form and content of the BT's Regulatory Financial Statements.

sustainable competition in downstream markets for electronic communications networks and services, resulting in the maximum benefit for retail consumers.

8.143 We consider that the proposed condition meets the criteria set out in section 47(2) of the Act because it is:

- objectively justifiable, in that it is necessary to ensure the appropriate maintenance and provision of accounts in order to monitor BT's activities with regard to the pricing remedies we propose in each of these markets. It also relates to the need to ensure competition develops fairly, to the benefit of consumers, by providing transparency of BT's compliance with rules set to address the risk of excessive pricing;

- non-discriminatory, in that BT is the only CP on which we propose to impose specific pricing remedies;

- proportionate, in that only information that is no more than necessary to monitor BT's activities with regard to the pricing remedies we propose is required to be maintained and provided; and

- transparent, in that it is clear in its intention to ensure the appropriate maintenance and provision of accounts for the purposes set out above and the particular accounting separation requirements of BT are clearly documented.

8.144 For the reasons set out above, we consider that the proposed condition is appropriate to address the competition concerns identified, in line with section 87(1) of the Act.

Requirements for accounting separation

Current remedies

8.145 BT is currently subject to accounting separation obligations.

Aim and effect of the regulation

8.146 The accounting separation obligations require BT to account separately for internal and external sales, which allows Ofcom and CPs to monitor the activities of BT to ensure that it does not discriminate unduly in favour of its own downstream businesses. In practice these obligations require BT to produce financial statements that reflect the performance of the regulated wholesale markets as though they were separate businesses.

Our proposals

8.147 Sections 87(7) and 87(8) of the Act authorise Ofcom to impose appropriate accounting separation obligations on a 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.

8.148 We propose that it is appropriate to impose an accounting separation obligation on BT in each of the wholesale leased lines markets in which we propose that it is has

SMP. We consider that this obligation is necessary to monitor BT's activities with regard to its non-discrimination obligations.

8.149 The SMP conditions and directions that we refer to in paragraphs 8.137 to 8.139 above also apply to the accounting separation obligations. We are proposing to impose those SMP conditions and directions subject to any necessary modifications for the same reasons as those described above.

Legal tests

8.150 For the reasons set out above and summarised below, we are satisfied that the proposed condition (as set out in Annex 6) meets the various tests set out in the Act.

8.151 We consider that this proposal meets our duties under sections 3 and 4 of the Act. We consider that the imposition of an accounting separation obligation promotes competition in relation to the provision of electronic communications networks and services, ensuring the provision of network access and service interoperability for the purposes of securing efficient and sustainable competition and the maximum benefit for the persons who are customers of CPs. This is because the imposition of the obligation would ensure that other obligations designed to curb potentially damaging leveraging of market power, in particular the requirement not to unduly discriminate, can be effectively monitored and enforced.

8.152 With regard to the Community requirements set out in section 4 of the Act, we believe that the proposed condition meets the requirements. Specifically, we believe section 4(8) is met, where the obligation has the purpose of securing efficient and sustainable competition in the markets for electronic communications networks and services, by helping to ensure that dominant providers comply with other obligations in particular non-discrimination requirements.

8.153 We also consider that this proposal meets Section 47(2) of the Act which requires conditions to be objectively justifiable, non-discriminatory, proportionate and transparent. We consider the proposed condition is:

- objectively justifiable, as it relates to the need to ensure competition develops fairly to the benefit of consumers;
- not unduly discriminatory as it is only imposed on BT, which is the only CP which we propose to find has SMP in the relevant markets in the UK excluding the Hull Area;
- proportionate, in that it is the least onerous obligation necessary as a mechanism to allow us and third parties to monitor potentially discriminatory behaviour by BT; and
- transparent, in that it is clear that the intention is to monitor compliance with specific remedies and the particular accounting separation requirements of BT are clearly documented within the SMP condition.

8.154 For the reasons set out above, we consider that the proposed condition is appropriate to address the competition concerns identified, in line with section 87(1) of the Act.

Price control remedies

Current remedies

8.155 BT is currently subject to a charge control that applies to most of its wholesale leased lines services.

Stakeholder input

8.156 Two stakeholders commented about the scope of the charge controls in their responses to the April 2014 CFI:

- TalkTalk said that the charge control should be extended to Openreach's WDM services. The charge control on 10Gbit/s Ethernet services, which Ofcom had intended should provide a constraint, had not been sufficient to prevent excessive pricing of the Optical Spectrum Access (OSA) WDM services, in part because the control allowed BT to set very high prices for 10Gbit/s Ethernet services. WDM services are becoming increasingly important for backhaul from larger BT exchanges and by the end of the next charge control will be a relatively mature technology which should therefore be subject to strong price regulation.[228]

- Sky said that it was concerned about the price of Openreach's high bandwidth services (bandwidths above 1Gbit/s) and asked Ofcom to assess their profitability and to consider applying a charge control.[229]

8.157 BT submitted a report produced by Plum Consulting concerning regulation during the transition from TI services to AI services.[230] [231] In relation to wholesale price controls, Plum Consulting argued that maintaining wholesale price controls for both TI and AI services would be likely to give rise to several problems:

- The increasing risk of failure of legacy services is unlikely to be signalled to end users via regulated prices, giving rise to a moral hazard problem and overexposure of users (particularly critical national infrastructure users) to failure of legacy TI services.

- It would be difficult to assess the appropriate rate of increase in prices of TI services given falling but uncertain demand for legacy services. Regulated prices may therefore be inefficient.

- Legacy services may be under-priced relative to new services given that their assets are more fully depreciated in accounting terms, thereby discouraging migration.

- If legacy services are under-priced, innovation, investment and development of alternative services will be discouraged.

[228] TalkTalk Response to the CFI, paragraphs 3.5 to 3.10
[229] Sky Response to the CFI, paragraphs 4.3 to 4.6.
[230] Plum Consulting, *Leaving a legacy: enabling efficient network transition, a report for BT*, February 2015, http://stakeholders.ofcom.org.uk/binaries/telecoms/market-reviews/Plum_February_2015_Leaving_a_legacy.pdf
[231] The Plum report also considered regulation of very low bandwidth retail services and arrangements for their withdrawal. We discuss these aspects in the Retail VLB Consultation.

8.158 Applying price controls to wholesale AI services but not to wholesale TI services would be analogous to the anchor pricing approach used by Ofcom in other markets subject to a technology transition (such as the WBA Market). BT would have greater freedom to set prices to incentivise efficient migration and the price controls on AI services would constrain BT's ability to set excessive charges for TI services.

8.159 Plum Consulting suggested that if Ofcom wished to allow BT greater wholesale pricing flexibility whilst maintaining safeguards it could consider:

- a volume threshold for removal of charge controls;
- a safeguard cap control that would allow more rapid price increases and greater flexibility to rebalance; or
- a safeguard cap which capped revenues at their current level thereby allowing BT flexibility to raise prices as service volumes fall.

8.160 In confidential submissions CityFibre said that it was concerned that BT had used the flexibility within the charge control for Ethernet services to make anti-competitive price reductions for high bandwidths services that were undermining other CPs incentives to make efficient investments in fibre infrastructure. In particular, BT had concentrated price reductions on 1Gbit/s and 10Gbit/s EAD and EBD services such that prices fell by ~50% and had reduced the price differential for term discounts. CityFibre asked Ofcom to review BT's price reductions and to intervene to moderate the price reductions that Openreach had announced for April 2015.[232] CityFibre asked Ofcom to take additional steps to maintain incentives for CPs to invest in fibre infrastructure and to prevent BT from engaging in anti-competitive or tactical pricing that could harm CPs. In particular, CityFibre suggested that Ofcom should:

- Adopt a different cost standard for the charge controls in order to maintain incentives for other CPs to invest in new fibre networks. It suggested that the appropriate cost base should be that of a Reasonably Efficient Operator (REO) or a modified Equally Efficient Operator (EEO) which should take account of the differences in scale between BT and its competitors, the fact that modern fibre networks are designed differently to BT's legacy network and would have different cost structures.
- Set price floors for individual services using the reasonable costs of the services based on either the REO or modified EEO.
- Discourage tactical pricing in relation to term discounts by including term discounts for charge control compliance purposes rather than excluding them as we do with the current charge control.
- Apply a reasonableness requirement to the charge control which would allow Ofcom to consider on an ad-hoc basis pricing practices which appear to be counter to good commercial practice and which give rise to concerns in the market.[233]

[232] CityFibre presentation to Ofcom 29 January 2015, page 12.
[233] CityFibre, letter to Ofcom 17 March 2015, sections 2 to 4.

Ofcom's comments

8.161 In relation to CityFibre's comments, the key issue is whether the Current Cost Accounting Fully Allocated Costs (CCA FAC) cost standard that we use for the leased line charge controls is appropriate and whether we should adopt a different standard such as that of a REO or an EEO in order to provide a greater incentive for other CPs to invest in network infrastructure. We intend to consider our position concerning the cost standard that we use for the charge control and also on the treatment of term discounts in the charge control in the June 2015 LLCC Consultation.

8.162 Judged against the CCA FAC cost standard that we adopted for the current charge control, the price reductions in April 2013 and May 2014 for 1Gbit/s and 10Gbit/s Ethernet services do not appear to have reduced prices to anti-competitively low levels. These price reductions were broadly in line with the overall charge control basket of RPI-11.5% that we introduced in April 2013 and, as of March 2015, prices for these services were above BT's FAC and therefore well in excess of BT's Distributed Long Run Incremental Costs (DLRIC), that we typically use as a first-order test of anti-competitive low pricing.

8.163 Regarding the suggestion that we should add an additional 'reasonableness requirement' to the charge controls, our initial view is that the proposed obligations for BT not to discriminate unduly and to ensure that its charges, terms and conditions are fair and reasonable are sufficient to address any concerns about unreasonable pricing practices that may arise.

8.164 We set out our views concerning price controls for Ethernet services at bandwidths above 1Gbit/s and WDM services in the discussion about our price control proposals below. We also discuss Plum Consulting's comments on charge controls for TISBO services below.

Aim and effect of the regulation

8.165 A price control condition is aimed at addressing BT's ability and incentive to charge excessive prices. Price control conditions can also be used to prevent anti-competitively low prices, though other remedies, such as a prohibition on undue discrimination, may be also be used.

8.166 In a competitive market, the charges for services would be set on the basis of the commercial judgements of individual companies and could be expected to deliver cost reflective prices. However, where a provider has SMP, competition cannot be expected to provide effective constraints and *ex ante* regulation may be desirable to prevent charges from being set at an excessive level. Such intervention could also have as its objective the aim of promoting efficiency and of allowing the development of effective competition in downstream markets.

8.167 In these markets BT has SMP and has an incentive and the ability to charge excessive prices. Excessive prices at the wholesale level could make it difficult for third party CPs to compete at the retail level with BT and in the long term, may result in market exit. Unjustifiably high wholesale charges are also likely to result in high retail prices, i.e. consumers would be paying more for a service than they should expect if wholesale prices were constrained by effective competition.

8.168 Section 87(9) of the Act authorises the setting of an SMP services condition setting price controls for network access and relevant facilities. Section 88 of the Act

specifies that Ofcom are not to set a price control unless it appears to Ofcom that there is a risk of adverse effects due to pricing distortions and it appears to Ofcom that setting a price control would promote efficiency, sustainable competition and confer the greatest benefits on the end users. Under section 88 Ofcom must also take account of the extent of the investment in the matters to which the condition relates to the person to whom it is to apply.

8.169 Having identified this relevant risk of an adverse effect arising from price distortion in our market analysis, we consider that this risk should be addressed by the imposition of an appropriate price control condition to apply for a period of three years following the completion of this market review and the charge control consultation process.

8.170 A price control can take a variety of forms,[234] including, but not limited to, a charge control, a cost orientation obligation and/or safeguard cap.

8.171 In selecting the form and level of price controls, we seek to balance a number of regulatory objectives. These included, among other things:

- preventing BT from setting excessive charges;
- promoting efficient and sustainable competition in the delivery of leased line services; and
- encouraging investment and innovation.

8.172 The weight that we apply to different regulatory objectives in setting a charge varies depending on the particular circumstances and services we are dealing with and the likely concerns arising from the market analysis we have carried out.

8.173 Below we set out our consideration of the most appropriate form of price control for each type of service.

CPI+/-X charge control for TISBO and wholesale Ethernet services at bandwidths up to and including 1Gbit/s and ancillary services

Our proposals

8.174 Under Ofcom's preferred method of charge control regulation – CPI+/-X – incentives are created on the dominant provider to increase its efficiency, thereby imitating the effect of a competitive market. The charge control is typically designed such that prices are based on the projected costs for the provision of the services at the end of the period, taking into account efficiency improvements and possible future investment by the dominant provider that would be of benefit to consumers and citizens. If the firm can reduce its costs below the level expected when the cap was set, then the firm retains the increased profits, at least for the period the control is in place.

8.175 Our initial view is that, with the exception of certain very high bandwidth CISBO services and our proposed dark fibre remedy (which we discuss further below), a CPI+/-X control would be the most appropriate form of price control for most of the services that BT offers in the wholesale TISBO and wholesale CISBO markets in the

[234] As suggested by Recital 20 of the Access Directive.

RoUK excluding the Hull area. We propose that the charge control should apply to the following types of wholesale leased lines services:

- in the wholesale low bandwidth TISBO market in the UK excluding the Hull area, charges for PPCs;
- in the wholesale CISBO market in the RoUK excluding the Hull area, charges for Ethernet services at bandwidths up to and including 1Gbit/s;
- in the wholesale CISBO market in the London Periphery, charges for Ethernet services at bandwidths up to and including 1Gbit/s;
- the interconnection and accommodation that BT provides in connection with wholesale TISBO and CISBO services in these markets, including services provided in connection with the proposed dark fibre remedy; and
- ancillary services including Excess Construction Charges (ECCs) and Time Related Charges provided in connection with wholesale TISBO and CISBO services in these markets, including services provided in connection with the proposed dark fibre remedy.

8.176 In our charge control we will make a provision for new services that wholly or substantially substitute existing services in a charge control basket to be added to the basket. This ensures that BT has an incentive to ensure that substitute services are at least as efficient as the ones they replace.

8.177 In relation to the first point raised by Plum Consulting, alongside this consultation we have published the Retail Very Low Bandwidth (VLB) Consultation setting out our proposals to: withdraw retail regulation for BT's retail VLB leased line services; and our plans to mitigate the potential risk associated with service withdrawal to critical national infrastructure services that use VLB leased lines.[235] This document, together with our proposal to allow BT to close the sub 2Mbit/s platform, provides a clear signal to customers that they need to move to alternative solutions.

8.178 We have also considered whether, given the decline in low bandwidth TI services, we should continue to maintain charge controls on these services. As we will set out in the forthcoming June 2015 LLCC Consultation, BT's profits on these services are currently high, and would remain high absent a charge control.[236] For 2Mbit/s services, these high profits, which are not likely to be eroded by competition due to BT's SMP, may make it difficult for wholesale customers to compete, and lead to high retail prices.

8.179 We acknowledge that retail competition in sub-2Mbit/s TI services will be limited in view of their impending withdrawal. Nonetheless, for both low and very low bandwidth wholesale TI services, if BT's profits for these services remained significantly in excess of costs, BT (as the network operator) may itself have an incentive to artificially extend the life of the network, given high on-going returns. This risk would be reduced if these high profits were eroded. We also note that the high prices of these services in relation to cost, risk consumers making inefficient choices.

[235] http://stakeholders.ofcom.org.uk/consultations/very-low-bandwidth/

[236] The June 2015 LLCC Consultation will consider the appropriate cost base for TI services, including whether any adjustments should be made due to depreciated assets.

Given the arguments above, we therefore propose to continue to charge control these services at the wholesale level.

8.180 The exact form, scope and level of the charge control will be considered in the June 2015 LLCC Consultation and will therefore the subject of further consultation through that process.

Legal tests

8.181 We will address the legal tests for the charge controls in the June 2015 LLCC Consultation. Nevertheless, we consider that in principle a charge control would meet the relevant legal tests as set out below.

8.182 As a result of our market analysis, in particular our assessment in Section 4, we consider the relevant risk of adverse effects arising from price distortion in accordance with section 88 is the risk that BT might fix and maintain its prices for CI services in the CISBO markets in the UK excluding the Hull area at an excessively high level.

8.183 For the reasons set out above, we consider that in principle a CPI+/-X charge control condition is appropriate to address the competition concerns identified, in line with section 87(1) of the Act.

8.184 We consider that the imposition of a charge control would 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, a charge control obligation 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.

8.185 We also consider a charge control 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 in the June 2015 LLCC Consultation. At this time, we consider that a charge control is, in principle:

- objectively justifiable, in that BT has SMP in the market, and, in the absence of the charge control, it is unlikely to be incentivised to reduce its costs and set prices at the competitive level;
- not unduly discriminatory, in that BT is the only operator to have SMP in the market;
- proportionate, in that 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.

Basis of charges condition for EAD and EAD Local Access services

8.186 In Section 10 we set out our proposals for a basis of charges condition for the differential between EAD and EAD Local Access services.

Basis of charges condition for our proposed dark fibre remedy

8.187 In Section 9 we set out our proposals for a basis of charges condition for the dark fibre remedy we are proposing.

Safeguard cap price control for high bandwidth CISBO services in the UK excluding the CLA, the LP and the Hull area

Our Proposals

8.188 In view of our proposal to implement a dark fibre remedy we consider that a CPI-CPI safeguard cap control, applied to each and every charge, is the most appropriate form of price control for BT's very high CISBO services (i.e. charges for single service Ethernet services at bandwidths above 1Gbit/s and WDM services) in the wholesale CISBO market in the RoUK excluding the Hull area.

8.189 As we set out in Section 4, BT earns significantly higher margins on very high CISBO services than on medium and high CISBO services. Very high CISBO services currently account for a relatively small share of CISBO sales, possibly as a result of these high margins. As set out in Section 4, we find that competitors such as Virgin account for a higher share of sales at these bandwidths than for overall CISBO services. The current high changes for these services suggest that we should be concerned about the risk of excessive pricing, but this is balanced against the potentially greater prospects for competition and infrastructure investment for these services. As a result, we consider that the control on prices should be less tight than for other CISBO products.

8.190 We expect the dark fibre remedy to be used mainly to provide very high CISBO services. As we have explained in Section 9 we are proposing that the dark fibre remedy should be subject to a basis of charges obligation. Our intention is that competition based on passive remedies should provide the primary constraint on prices for very high CISBO services.

8.191 However, our proposed dark fibre remedy will not be available before the second year of the control, and it is possible that it will take some time to be established. We also cannot rule out that it will not be successful. If we were to impose no pricing restrictions on very high CISBO services, and if the development of dark fibre were less successful than we anticipate, then there is a risk that consumers will not be sufficiently protected from the risk of excessive pricing.

8.192 We therefore propose a CPI-CPI safeguard cap on very high CISBO services. With this type of control, the dominant provider's prices are capped in nominal terms i.e. prices for the controlled services may not rise during the charge controlled period. If our passive remedy develops swiftly, such that this constraint is no longer necessary, then this constraint can be lifted by Direction.

8.193 In reaching this proposal, we have balanced our objectives of preventing excessive pricing, promoting efficient and sustainable competition and encouraging investment and innovation.

8.194 We plan to set out the notification and legal tests for the proposed condition in the June 2015 LLCC Consultation. Nevertheless we consider that in principle the proposed condition would satisfy the relevant legal tests in the Act as set out below.

8.195 Currently the provision of MISBO services (equivalent to very high CISBO) is not regulated in the WECLA (which closely equates to the CLA and the LP). We note that relative to the rest of the UK, the prospects for infrastructure competition are somewhat better in the LP, aided by greater presence of rival infrastructure and its proximity to the CLA. We expect that in future the dark fibre remedy we propose will be the main vehicle for competition for very high bandwidth services. In view of these factors we have considered that it would not be proportionate to introduce a new safeguard cap for very high CISBO services in the LP.

Legal tests

8.196 As a result of our market analysis, in particular our assessment in Section 7, we consider the relevant risk of adverse effects arising from price distortion in accordance with section 88 is the risk that BT might fix and maintain its prices for very high CI services in the wholesale CISBO markets in the RoUK excluding the Hull area at an excessively high level.

8.197 For the reasons set out above, we consider that in principle a safeguard cap control condition is appropriate to address the competition concerns identified, in line with section 87(1) of the Act.

8.198 We consider that the imposition of a safeguard cap control would 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, a price control obligation 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.

8.199 We also consider a safeguard cap control 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 set out the formal notification for the safeguard cap in the June 2015 LLCC Consultation. At this time, we consider that a price control is, in principle:

- objectively justifiable, in that BT has SMP in the market, and, in the absence of the charge control, it is unlikely to be incentivised to reduce its costs and set prices at the competitive level;
- not unduly discriminatory, in that BT is the only operator to have SMP in the market;
- proportionate, in that 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.

Question 8.1: Do you agree with the general remedies that we propose for BT in the wholesale TISBO and CISBO markets? If not, what alternative remedies would you propose and why?

Section 9

Specific remedy for the CISBO markets - Dark Fibre Access

Introduction

9.1 In this section we set out the specific remedies relating to the provision of dark fibre that we propose to impose on BT in the following wholesale leased line markets:

- market for Contemporary Interface Symmetric Broadband Origination (CISBO) services in the London Periphery (LP); and
- market for CISBO services in the Rest of UK (RoUK) excluding Hull.

9.2 This follows our assessment in Section 7 that it is appropriate to include dark fibre in the package of remedies we propose to impose on BT.

9.3 The package of remedies we propose to impose in the CISBO markets in which we find that BT has SMP includes the proposals in this section, the proposed general remedies set out in Section 8, the proposed specific active remedies set out in Section 10, the interconnection and accommodation remedies set out in Section 12, and the Quality of Service proposals in Section 13.

9.4 These proposed SMP remedies are based on the nature of the competition problems we have identified in relation to the CISBO markets.

9.5 In response to both the April 2014 CFI and the November Consultation, stakeholders provided views on high-level considerations in relation to non-price aspects of the design of passive access. We have summarised these responses in Annex 25. We have also set out in that annex our considerations of technical and operational aspects of the potential provision of a regulated dark fibre access product.

Summary of proposals

9.6 We propose to include in the network access condition in the CISBO markets a requirement for BT to provide access to its fibre infrastructure for the purposes of providing disaggregated leased line terminating segments. BT would be required to provide dark fibre leased line terminating segments, i.e. fibre terminating segments without terminal equipment. We refer to this proposed remedy as Dark Fibre Access (DFA).

9.7 We also propose to impose remedies to ensure that CPs can obtain dark fibre circuits in configurations that are comparable to the current range of active services offered by Openreach, and on the same basis (including processes and timing) as those corresponding active services.

9.8 The DFA remedy supplements the general remedies which we have proposed in Section 8 and BT's dark fibre products would also be subject to these general remedies. Similarly, the interconnection and accommodation remedies for the CISBO markets that we have set out in Section 12 would also apply.

9.9 We also propose to impose a condition requiring BT to price the dark fibre products by reference to corresponding active products less the LRIC of the active elements of those products. Our reasons for proposing this condition are set out in this section, but the proposed condition itself will be set out in our June 2015 LLCC Consultation. To support this proposed condition, and to provide clarity and transparency for BT and other CPs, we propose to issue guidance on how we would assess compliance with the condition. Again, we will consult on this guidance as part of our June 2015 LLCC Consultation.

9.10 We consider that the remedies we propose are necessary and proportionate to address the competition problems set out in Section 7. In particular, we consider that in the absence of appropriate *ex ante* regulation, BT would not provide access to dark fibre on terms that would secure efficient investment and innovation in the CISBO markets or promote competition in those markets and related downstream retail markets.

9.11 We consider that these remedies would achieve our statutory duties and would satisfy the relevant legal tests. In reaching these proposals we have taken account of views expressed by stakeholders in response to the April 2014 Call for Inputs, the November Consultation, our regulatory experience from the previous market reviews, recent developments in this market, and expected developments over the review period of three years.

9.12 Table 9.1 below summarises our proposals.

Table 9.1: Summary of proposed dark fibre remedy

Markets	Proposed dark fibre remedy	
CISBO in the Rest of UK excluding Hull CISBO in the London Periphery	**Specific access obligation**	Provide dark fibre terminating segments upon reasonable request and on fair and reasonable terms, conditions and charges. Provide dark fibre terminating segments, including: • disaggregated access and backhaul segments • short range end-to-end segments
	Non-discrimination	• No undue discrimination • Equivalence of Inputs
	Reference offer	Specified minimum requirements for reference offer
	Pricing	'Active–minus' by reference to the corresponding 1Gbit/s product and the LRIC of its active elements, complemented by guidance on the calculation of the LRIC of the active elements.[237]
	Implementation	• Publish a draft reference offer within 4 months • Publish a final reference offer within 7 months • Launch dark fibre access within one year

Requirement to provide access to dark fibre on reasonable request

Aim and effect of regulation

9.13 We set out in Section 7 why we consider that access to both dark fibre and active services would be the most appropriate way of addressing the competition concerns arising from SMP in these markets. The level of investment required by a third party to replicate BT's network and build sufficiently large access networks to compete is a significant barrier to entry. In addition, we consider that in the absence of appropriate *ex ante* regulation, BT would not make dark fibre available to third parties.

9.14 For this reason, a requirement to offer access to dark fibre on reasonable request is a key part of our remedies proposal.

Our proposals

Scope of the remedy

9.15 A number of respondents to the November Consultation provided comments on whether the restrictions of passive remedies to particular product types or geographic areas might affect the usefulness and benefits of the passive remedy. The majority of stakeholders held the view that such restrictions would impact upon the benefits and use of passives. Many stakeholders proposed arguments for the potential impacts restrictions could bring. We have set out the summary of these responses in Annex 25.

[237] We are planning to publish our guidance on the approach to active minus assessment in the forthcoming leased line charge control consultation

9.16 In relation to the geographic scope of a remedy, we recognise that some stakeholders argued for the passive remedy to be as widely available as possible, with few restrictions. However, we can only impose remedies where we find SMP. Our proposed market definitions and assessment of the competition problems in the markets we define for wholesale leased lines, in terms of both product characteristics and geography, has informed our consideration of the appropriate scope of the remedies, including dark fibre.

9.17 Our current analysis leads us to propose defining a number of separate markets, reflecting differences in competitive conditions between certain product types and geographic areas. In particular, based on our proposed findings set out in Sections 4 and 5, we propose that BT has SMP in the following markets:

- the wholesale market for CISBO services in the London Periphery (LP);
- the wholesale market for CISBO services in the Rest of UK (RoUK) excluding Hull; and
- the wholesale market for low bandwidth Traditional Interface Symmetric Broadband Origination (TISBO) services (up to and including 8Mbit/s) in the UK excluding the Hull area.

9.18 We do not propose to find SMP in the provision of CISBO services in the Central London Area (CLA).

9.19 We consider that the opportunities which could be enabled by dark fibre for innovation, differentiation and reductions in overall equipment costs are particularly relevant in CISBO services, for which demand is growing. In light of this and of our proposed SMP findings, we consider that if we were to impose a dark fibre remedy on BT, it should apply throughout the geographic areas in which BT has SMP in CISBO markets. Our current view is that such geographic scope would allow any CP to use physical access to fibre nationwide to offer innovations, service differentiation and/or more cost-effective solutions. This is because access to fibre would be provided by BT on a regulated basis in areas in which it has SMP, while in the CLA (where BT does not have SMP) it could be provided either by the CP itself or, potentially, by another CP on a commercial basis. In this respect, we consider that a remedy with a more restricted geographic scope, which might cover only some of the areas in which we propose that BT has SMP, could limit the scope for innovation as well as add to the costs and complexity of addressing opportunities which require wide geographic coverage.

9.20 Similar considerations arise in relation to the allowed use of the remedy. We consider that there are a wide range of applications for which the regulated dark fibre product could be used and the benefits are likely to be realised across various segments in the business connectivity market.

9.21 We acknowledge stakeholders' concerns that, if we were to limit the allowed use, this would restrict the ability of CPs to develop their products based on passive inputs and that this is likely to significantly reduce the benefits of passive access. In particular, limiting allowed use would not allow CPs to maximise the scale and scope efficiencies of their investment and to target emerging customer requirements, while on the other hand leading to further complexity in the design of the remedy and reducing the practical use that can be made of dark fibre.

9.22 We also note Virgin Media's concerns around monitoring and enforcement of the passive remedy when applied in certain geographic areas or to certain products. We acknowledge that if we were to limit the product scope of a passive remedy, this may lead to some challenges in relation to establishing the actual downstream use of dark fibre.

9.23 While restricting the scope of passive remedies to particular applications, such as mobile backhaul, may reduce the dynamic efficiency risks, it would only be appropriate if innovation benefits were concentrated in a particular market segment. In addition, as explained in Annex 26, our proposed pricing approach of having a higher value benchmark product (i.e. 1Gbit/s EAD) significantly reduces the scale of dynamic efficiency risks.

9.24 We therefore do not consider it appropriate to restrict the use of the remedy to any specific applications or products in the wholesale leased lines markets. As we set out in Annex 23, the benefits are likely to be realised across a range of applications and any undue restrictions in product use may reduce the benefits of passive access. In particular, limiting the allowed use may prevent CPs from maximising the scale and scope efficiencies of their investment.[238]

9.25 In summary, we propose to include the provision of dark fibre in the network access condition for the wholesale markets for CISBO in the London Periphery and for CISBO in the Rest of UK (i.e. the UK excluding the CLA and the London Periphery) excluding Hull.

9.26 We explain in Section 4 that we do not propose to find SMP in core conveyance, which is CISBO connectivity between certain buildings in major urban centres throughout the UK, including particular exchanges and data centres. A number of CPs have extended their fibre infrastructure to these buildings and provide core conveyance. In light of this we have considered whether it would be appropriate to apply a distance limit to the dark fibre remedy to provide additional clarity about its scope and to minimise the risk of dark fibre being used to provide core conveyance.

9.27 With the current active remedies there are no explicit distance limitations imposed by regulations, but the risk of usage for core conveyance is minimised by the product specifications for BT's wholesale services. BT specifies distance limits for most of its Ethernet services and BT's main backhaul product EBD is only available between specified locations.

9.28 The dark fibre service would be inherently more flexible in terms of circuit lengths and circuit end-points and absent other restrictions could more readily be used to provide core conveyance. For example, a CP could use the dark fibre service to provide a long distance link between London and Birmingham.

9.29 This gives rise to a concern that the dark fibre service might undermine existing infrastructure investments in the competitive core market. In view of this, we consider it appropriate to apply a distance limit to the dark fibre remedy as an additional safeguard.

[238] As explained further in this section, we propose to have a higher value benchmark product (i.e. 1Gbit/s EAD) in order to reduce the scale of unintended consequences. While we do not seek to restrict the use of a remedy to any specific bandwidth, we note that from an economic perspective, this approach may mean that the CPs may focus their use of passive access to the provision of downstream services with a bandwidth equal to or greater than the reference product.

9.30 Our view is that the distance limit should be sufficient for a CP to provide a backhaul connection to the nearest competitive core node. In this context we note that the average distance between BT's ASN aggregation nodes and competitive core nodes is 20km and that 90% are within 50km. We consider that this distance limit would be a reasonable proxy for backhaul circuit distances and we therefore propose a distance limit of 50km, measured on a straight line basis between the circuit ends. We provide further details of our analysis in Annex 25.

9.31 As also explained in Section 8, the network access condition will require BT to provide network access on fair and reasonable terms, conditions and charges, which will apply equally to dark fibre. The reasons for requiring the provision of network access on fair and reasonable terms, conditions and charges are as set out more generally in Section 8.

Design of the remedy

9.32 The proposed obligation would seek to replicate the outcome we would expect in an effectively competitive market, in which providers assemble a wide range of inputs in order to compete and have an incentive to innovate. We consider that an appropriate way to ensure effective competition is to impose an SMP condition on BT requiring it to provide dark fibre terminating segments upon reasonable request and on fair and reasonable terms, conditions and charges.

9.33 We consider that, in the absence of such a requirement, BT would have an incentive and the ability to refuse access to dark fibre, with the effect of hindering efficiency, innovation, and effective and sustainable competition in the corresponding downstream markets, ultimately against end users' interests.

9.34 Our aim is for dark fibre to enable CPs to provide leased line services in competition with BT, which support innovation, competition and investment in the supply of downstream markets. Our proposed remedy would provide a form of physical access, which, at a minimum, should allow CPs to replicate the features of certain active access products to enable CPs to provide leased line services in competition with the wholesale services which BT offers and uses itself. Therefore we consider that CPs should be able to obtain dark fibre circuits in similar configurations to some of the current range of BT's active services. We propose to require BT to provide dark fibre terminating segments, including:

- disaggregated access and backhaul segments;
- short range end-to-end segments.

9.35 In order to achieve our aim we consider it important to provide consistency with the active services to ensure that CPs purchasing a passive input will not be put at a competitive disadvantage to purchasers of active products in terms of the configurations and applications available with certain key active access services, and also in relation to the quality, processes and systems with which BT would provide the passive input. We also consider that our dark fibre design proposals, which are modelled on active wholesale leased line services, would significantly reduce the risk and impacts we discussed in Annex 24 ensuring that CPs' choices between using dark fibre and active products are based on efficiency considerations rather than arbitrage opportunities.

9.36 We consider that the technical, operational (provisioning and repair) and commercial aspects of BT's current offer of Ethernet services should provide a benchmark for

establishing the arrangements applicable to dark fibre. In particular, BT's EAD and EAD LA services should provide a benchmark for the purpose of development of dark fibre.[239] These products provide a wide range of connectivity options which CPs should be able, at minimum, to replicate by using dark fibre. They can be used to fulfil both access and backhaul requirements. We also consider that BT's processes and systems for providing EAD and EAD LA should be capable of adaptation to include the provision of dark fibre access. In our view, this approach would help ensure that there is no undue discrimination between BT's provision of dark fibre and active services, and also have the advantage of minimising implementation costs and limiting the operational challenges associated with the introduction of a dark fibre remedy.[240]

9.37 For example, under the current arrangements, in cases where new infrastructure specific to serving an end-user is required to fulfil an order for a leased line, BT constructs this infrastructure and levies Excess Construction Charges (ECCs). Given the coexistence between active and passive remedies, and in line with our objective to allow CPs to purchase dark fibre inputs to create their own active solutions, we propose that BT adopts similar arrangements for dark fibre. We consider that this will enable CPs to deliver comparable outcomes to active products and to use them to compete effectively. In addition, this would support our aim of incentivising CPs to make economically efficient choices between active access and dark fibre.

9.38 We do, however, anticipate that BT's dark fibre products would differ from EAD services in some respects. For example, some differences in fault repair processes may be necessary as BT would not have the proactive circuit monitoring capability that it has with active services. We also think that a dark fibre remedy could facilitate new handover arrangements for the termination of access segments. Unlike active services, which are generally terminated in buildings (because of power and environmental requirements), it would be feasible for dark fibre access segments to be terminated in external structures such as joint boxes, where they could, for example, be directly spliced to CPs' fibre networks.

9.39 Depending on the specification of the service to be provided, leased lines require one or two fibres. Therefore we also propose to require BT to include the option for one or two fibres as per CPs' requirements.

Interconnection and accommodation services

9.40 We consider that CPs will require interconnection and accommodation services in order to use the dark fibre remedy effectively.

9.41 Our initial view is that the accommodation service that BT offers in the wholesale leased lines markets would be suitable for the dark fibre remedy. These services allow CPs to rent colocation space and associated ancillary services, such as power and tie-cables, so that they can aggregate access segments efficiently.

9.42 Similarly, we consider that the interconnection services that BT offers in wholesale leased lines markets would also be suitable for the dark fibre remedy. As we have

[239] We also propose that EAD should be used as a benchmark for pricing, The reasons for this are discussed further in this Section and in Annex 26, which covers our choice of the benchmark product.
[240] Although, as explained below, we base the dark fibre price on an EAD pricing structure, our intention is that CPs could also use the remedy for other types of services such as backhaul and WDM services comparable to Openreach's EBD and OSA services.

discussed in more detail in Annex 16, In Building Handover (IBH) and Customer Sited Handover (CSH) are the most prevalent forms of handover in the wholesale CISBO markets.

9.43 In view of these considerations, we have proposed in Section 12 that the interconnection and accommodation obligations we are proposing for the active remedies in the wholesale CISBO markets should also apply to the dark fibre remedy.

9.44 We think there may be demand for other forms of interconnection, specifically In-Span Handover (ISH) and ISH Extension which are more commonly used in the wholesale TISBO markets. We consider that requirements are best agreed as part of the implementation process. As the demand for these types of interconnection is not yet established we have not proposed to impose specific obligations in relation to these types of interconnection.

Legal tests

9.45 For the reasons set out above and summarised below, we are satisfied that the proposal to include dark fibre in the network access condition (as set out in Annex 6) meets the relevant tests set out in the Act.

9.46 Section 87(3) of the Act authorises the setting of an SMP services condition requiring the dominant provider to provide such 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.

9.47 When considering the imposition of such conditions in a particular case, we must take into account six factors set out in Section 87(4) of the Act, including inter alia:

- the technical and economic viability of installing and using other facilities, including the viability of other network access products, whether provided by the dominant provider or another person, that would make the proposed network access unnecessary;
- the feasibility of the proposed network access;
- the investment made by the person initially providing or making available the network or other facility in respect of which an entitlement to network access is proposed (taking account of any public investment made); and
- the need to secure effective competition (including where it appears to us to be appropriate, economically efficient infrastructure based competition) in the long term.

9.48 In proposing the general requirement for the provision of network access, we have taken all of the factors in section 87(4) into account.

9.49 The definition of access and the way in which we might assess reasonable demands for access are set out in our Access Guidelines.[241] We consider it is appropriate in cases where we propose a CP has SMP (such as BT in this case) to impose an access obligation on that provider requiring it to meet all reasonable requests for network access within the relevant wholesale market, irrespective of the technology required, on fair and reasonable terms, conditions and charges.

9.50 As discussed in our SMP assessment in Sections 4 and 5, there are considerable sunk costs associated with building networks to provide leased lines services. We consider it is unlikely to be economically viable or efficient to build competing access networks on a sufficient scale to provide effective constraint on BT's SMP in the downstream markets.

9.51 Therefore, we are currently of the view that a requirement for BT to provide specific network access is appropriate. It facilitates competition in downstream markets by enabling CPs to compete without the need to invest in a network, an investment which we consider, on the basis of our market analysis, represents a structural barrier to entry and expansion in the leased lines markets.

9.52 Consequently, we consider these requirements are necessary for securing effective competition, including promoting innovation and securing economically efficient infrastructure based competition, in the long term. The requirements for BT only to meet reasonable network access requests also ensures that due account is taken of the technical and economic viability of installing and using other facilities, the feasibility of the proposed network access, and of the investment made by BT initially in providing the network.

9.53 We consider that this proposal meets our duties under sections 3 and 4 of the Act. We consider that the imposition of a network access obligation promotes competition in relation to the provision of electronic communications networks and services, ensuring the provision of network access and service interoperability for the purposes of securing efficient and sustainable competition and the maximum benefit for the persons who are customers of CPs. This is because the imposition of the obligation would ensure that BT offers the wholesale products required by other CPs to compete effectively in the downstream markets.

9.54 With regard to the Community requirements set out in section 4 of the Act, we believe that the proposed condition meets the requirements. Specifically, we believe section 4(8) is met, where the obligation has the purpose of securing efficient and sustainable competition in the markets for electronic communications networks and services, by helping to ensure that other CPs can compete effectively in the downstream retail markets by using wholesale products offered by BT.

9.55 Section 47(2) of the Act requires conditions and directions respectively to be objectively justifiable, non-discriminatory, proportionate and transparent. The proposed conditions and directions are:

- objectively justifiable, in that they facilitate and encourage access to BT's network and therefore promote competition to the benefit of consumers;

[241] See *Imposing access obligations under the new EU Directives*, 13 September 2002, available at http://www.ofcom.org.uk/static/archive/oftel/publications/ind_guidelines/acce0902.htm

- not unduly discriminatory, as they are proposed only for BT and no other CP has been found to hold a position of SMP in these markets;
- proportionate, since they are targeted at addressing the market power that we propose BT holds in these markets and do not require it 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 provide access to its networks in order to facilitate effective competition.

9.56 For the reasons set out above, we consider that the proposed conditions are appropriate to address the competition concerns identified, in line with section 87(1) of the Act.

The BEREC Common Position

9.57 We have also taken utmost account of the BEREC Common Position in formulating our proposals.[242] In particular, in relation to achieving the objectives of "assurance of access" and of "fair and coherent access pricing" we have referred to paragraphs BP5 and BP36. We consider that our proposals are consistent with the best practice set out in the BEREC Common Position.

Requirement not to discriminate unduly and Equivalence of Inputs (EOI)

Current remedies in relation to active products in CISBO markets

9.58 BT is currently prohibited from discriminating unduly in relation to the provision of network access in each of the wholesale leased lines markets in which it has SMP. This obligation is imposed in Condition 3 of the current SMP Conditions and applies to all regulated wholesale leased lines markets in the UK (excluding the Hull area). BT is also subject to a specific requirement to provide CISBO services on an EOI basis.

Aim and effect of the regulation

9.59 Article 8(1) of the 2002 EC Directive on access to, and interconnection of, electronic communications networks and associated facilities (the Access Directive)[243] requires Member States to ensure that national regulatory authorities are empowered to impose certain obligations where an operator is designated as having SMP. These include, under Article 10 of the Access Directive, obligations of non-discrimination. Article 10(1) provides that a national regulatory authority may: "impose obligations of non-discrimination, in relation to interconnection and/or access". Article 10(2) further provides:

[242] BoR (12) 126, *BEREC common position on best practice in remedies imposed as a consequence of a position of significant market power in the relevant markets for wholesale leased lines,* 26 November 2012, http://berec.europa.eu/files/document_register_store/2012/11/BoR_(12)_126_Draft_WLL_CP_2012.11.26.pdf

[243] EC, Directive 2002/19/EC of the European Parliament and of the Council of 7 March 2002 on access to, and interconnection of, electronic communications networks and associated facilities, http://www.eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2002:108:0007:0020:EN:PDF

> "[o]bligations of non-discrimination shall ensure, in particular, that the operator applies equivalent conditions in equivalent circumstances to other undertakings providing equivalent services, and provides services and information to others under the same conditions and of the same quality as it provides for its own services, or those of its subsidiaries or partners".

9.60 Article 10 of the Access Directive is implemented into UK law by section 87(6)(a) of the Act which gives us a power to impose "a condition requiring the dominant provider not to discriminate unduly against particular persons, or against a particular description of persons, in relation to matters connected with network access to the relevant network or with the availability of the relevant facilities". We consider any conditions imposed pursuant to this power require equivalence as per Article 10(2).

9.61 A non-discrimination obligation is intended as a complementary remedy to the network access obligation, principally to prevent the dominant provider from discriminating in favour of its own downstream divisions and to ensure that competing providers are placed in an equivalent position. Without such an obligation, the dominant provider is incentivised to provide the requested wholesale network access service on terms and conditions that discriminate in favour of its own downstream divisions. For example, BT may decide to charge its competing providers more than the amount charged to its own downstream units or it might strategically provide the same services but within different delivery timescales. Both these behaviours could have an adverse effect on competition.

9.62 Non-discrimination can have different forms of implementation. A strict form of non-discrimination – i.e. a complete prohibition of discrimination – would require the SMP operator to provide 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 CP's own downstream divisions) would be provided on a truly equivalent basis, an arrangement which has become known as EOI. An EOI obligation removes any degree of discretion accorded to the nature of the conduct. The concept of EOI was first identified in the Strategic Review of Telecoms in 2004/05 as one of our key policy principles to ensure that regulation of the telecommunication markets is effective. Following on from this review, a specific form of EOI was implemented in 2005 by means of the BT Undertakings.

9.63 On the other hand, a less strict implementation of non-discrimination may allow for flexibility and result in a more practical and cost-effective implementation of wholesale inputs in cases where it is economically justified. As part of this review, we have considered what form of non-discrimination obligation would be appropriate for a dark fibre access remedy.

Our proposals

9.64 As set out in Section 8, we propose a condition requiring the provision of network access on an EOI basis, and a condition requiring no undue discrimination. As part of our analysis, we have considered whether these conditions would be appropriate in relation to the provision of dark fibre. In the absence of such an obligation BT would have the incentive to provide passive access on terms and conditions that favour its own downstream divisions. This could be price-based discrimination or non-price discrimination. Stakeholders' responses which we summarise in Annex 25 also stressed the need for adequate protection.

9.65 We propose that BT would be required to provide dark fibre on the basis of EOI. This should ensure that CPs can compete on a level playing field in providing services which use dark fibre. For the avoidance of doubt, we do not propose to require BT to consume a dark fibre product in providing active services.

9.66 We also propose that, in providing dark fibre, BT should be subject to the no undue discrimination obligation to address potential concerns regarding BT's ability and incentive to discriminate between wholesale customers of its passive and active products, and between customers of different passive products .

EOI

9.67 In Section 8 we set out our consideration of the most appropriate form of non-discrimination obligation for the remedies in the CISBO markets in which BT has SMP and our proposal that they should be provided on an EOI basis.[244] In our current view, similar considerations apply in relation to dark fibre, and we therefore propose that BT should provide dark fibre on the basis of EOI.

9.68 In the absence of such a requirement, we consider that BT's SMP in these markets means that it would have both the incentive and the ability to refuse to provide dark fibre access, thereby favouring its own downstream operations with the effect of hindering effective and sustainable competition in the corresponding downstream markets, ultimately against the interests of end users.

9.69 In particular, we consider that in the absence of EOI BT would have the incentive to provide superior dark fibre products to its downstream divisions compared with those it provides to other CPs. BT could discriminate in terms of price, by charging competing providers more than its own downstream divisions. There could also be non-price discrimination. We believe that BT would have incentives, and its market power would give it the ability, to supply products with different levels of quality – e.g. different SLAs and SLGs, providing and repairing products on different timescales, creating new variants to fulfil the requirements of its downstream division, prioritising the needs of its downstream divisions in developing improvements and enhancements, and taking longer to address, or avoiding addressing, the requirements of its competitors.

9.70 In relation to BT and Virgin Media's concerns around the implementation costs and the need for restructuring, we consider that this likely to be the case if we were to require BT to consume dark fibre to provide existing services. We recognise that any requirement on BT to consume its regulated dark fibre products as inputs to its existing services would involve re-engineering many of its business processes. This could lead to a disruption in the provision of the existing services as well as adding to the overall scale of costs associated with introducing a passive remedy. Therefore, we do not consider that it would be proportionate to require BT to consume its regulated dark fibre products as inputs for the provision of all the existing and new active wholesale leased line services.

[244] As discussed in Section 8, the EOI obligation does not apply to very high CISBO services in the London Periphery.

No undue discrimination

9.71 We consider that it is appropriate to apply the no undue discrimination obligation to dark fibre access in order to prevent anti-competitive differences in pricing and terms between BT's products.

9.72 We consider there is a risk that an EOI requirement may not be fully effective in preventing BT from behaving in a manner which is unduly discriminatory against third parties, particularly if BT chose to consume one form of access in preference to another. This could distort competition by favouring some products over others. In particular, an EOI requirement would not protect against all forms of non-price discrimination that may arise, such as setting pricing structures or terms that favour one type of remedy that is consumed primarily by BT; or favouring investments that are better suited to BT's own downstream operations' commercial plans than to those of rivals.

9.73 Similarly, we would expect BT to adopt comparable arrangements in relation to quality of service, including SLAs/SLGs for dark fibre as for Ethernet services. However, to the extent that there may be any differences (such as with fault repair), they should be objectively justified with reference to the nature of supply of dark fibre. Also, in circumstances where there is a new infrastructure build component to provide access network extensions that are specific to an individual customer (subject to ECCs), we would be likely to consider it unduly discriminatory if the terms applicable to dark fibre products were not identical to those applied in the provision of active circuits.

Legal tests

9.74 For the reasons set out above and summarised below, we are satisfied that making DFA subject to the proposed EOI and no undue discrimination obligations (as set out in Annex 6) in the CISBO markets meets the relevant tests set out in the Act.

9.75 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.

9.76 We have also 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 preventing BT from leveraging its SMP into downstream markets.

9.77 Section 47 of the Act requires conditions to be objectively justifiable, non-discriminatory, proportionate and transparent. The proposed conditions are:

- objectively justifiable in that they provide safeguards to ensure that competitors, and hence consumers, are not disadvantaged by BT discriminating unduly in favour of its own downstream activities or between different competing providers;
- not unduly discriminatory in that they are proposed only for BT and no other operator has been found to hold a position of SMP in these markets;
- proportionate in that they only seek to prevent undue discrimination; and

- transparent in that the conditions are clear in what they are intended to achieve.

9.78 For the reasons set out above, we consider that the proposed conditions are appropriate to address the competition concerns identified, in line with section 87(1) of the Act.

The BEREC common position

9.79 We have taken utmost account of the BEREC Common Position in formulating our proposals.[245] In particular, in relation to achieving the objective of a level playing field we have had regard to paragraphs BP8, BP10 and BP10a. We consider that our proposals are consistent with the best practice set out in the BEREC Common Position.

Approach to regulating prices of dark fibre

Current remedies in relation to prices of active products in CISBO markets

9.80 BT is currently subject to a charge control which applies to most of its wholesale leased lines services.

Aim and effect of the regulation

9.81 A price control condition is aimed at addressing BT's ability and incentive to charge excessive prices. Price control conditions can also be used to prevent anti-competitively low prices, though other remedies, such as a prohibition on undue discrimination, may be also be used.

9.82 In a competitive market, the charges for services would be set on the basis of the commercial judgements of individual companies and could be expected to deliver cost reflective prices. However, where a provider has SMP, competition cannot be expected to provide effective constraints and *ex ante* regulation may be desirable to prevent charges from being set at an excessive level. Such intervention could also have as its objectives the aim of promoting efficiency and of allowing the development of effective competition in downstream markets.

9.83 In these markets BT has SMP and has an incentive and the ability to charge excessive prices. Excessive prices at the wholesale level could make it difficult for OCPs to compete at the retail level with BT and in the long term, may result in market exit. Unjustifiably high wholesale charges are also likely to result in high retail prices, i.e. consumers would be paying more for a service than they should expect if wholesale prices were constrained by effective competition.

9.84 A price control can take a variety of forms,[246] including, but not limited to, a charge control, a cost orientation obligation and/or safeguard cap.

[245] BoR (12) 126, BEREC common position on best practice in remedies imposed as a consequence of a position of significant market power in the relevant markets for wholesale leased lines, 26 November 2012, http://berec.europa.eu/files/document_register_store/2012/11/BoR_(12)_126_Draft_WLL_CP_2012.11.26.pdf

[246] As suggested by Recital 20 of the Access Directive

Our proposals

9.85 We describe below our proposed remedies in relation to the pricing of DFA, and the rationale for these remedies. However, the SMP conditions that we propose in relation to the pricing of DFA are not set out in Annex 6. Instead, these conditions will be set out in the forthcoming June 2015 LLCC Consultation.

Charge control

9.86 We are concerned that BT could charge excessive prices for dark fibre, which would deter its take up. This may lead to distortion in downstream competition as the relative pricing of active and passive remedies would be a key driver of how and where passive remedies are used, and of the ultimate impact on competition and consumers, in particular it could ultimately lead to higher downstream prices than is appropriate for the provision of the services. We therefore consider that dark fibre should be subject to a charge control.

Pricing options

9.87 We have set out our discussion and assessment of the pricing options and approaches in Annex 26.[247] Having considered the pros and cons of each, in our view an 'active-minus' approach, implemented by subtracting the cost of the active components of the reference product(s) at a high bandwidth (1Gbit/s), provides the best balance of potential costs and benefits, as it would reduce potential for a range of negative impacts. The aim of an 'active-minus' pricing approach is to reduce the regulatory arbitrage opportunities which could occur under the existing active pricing structure. Similarly, using a reference product enables a reduction in arbitrage opportunities by maintaining a link between the passive access price and the contribution to fixed and common costs built into the active price structure. This option would involve using the active products to set a wholesale passive access price which would apply irrespective of the downstream service it was used to provide.

9.88 We recognise that some rebalancing of prices may still be required to maintain BT's opportunity for cost recovery, however our proposed choice of a higher value benchmark product such as BT's EAD 1Gbit/s (which makes a proportionately higher margin/contribution to common costs than products of lower bandwidths) would further reduce the extent to which rebalancing is necessary. It would limit significantly the potential for distributional effects that could lead BT to rebalance leased line or copper product charges. We plan to set out our analysis of common cost recovery in the June 2015 LLCC Consultation.

9.89 We consider that any consequent rebalancing of BT's charges is likely to result in minimal if any increases in the prices paid by end users. For example, if we decide to impose reductions in the prices of active services, as we did in concluding the 2013 BCMR, we would expect that the impact on charges for services of bandwidths lower than 1Gbit/s of including the dark fibre remedy we propose in the overall package of remedies would be more moderate reductions in those charges relative to the reductions that would result from an approach with active remedies only. We are also confident that the impacts can be limited to the leased lines markets and as such we

[247] More specifically, we have considered a cost-based approach and a value based ('active-minus') approach. We identified three ways in which an 'active minus' approach could be implemented: on each product individually, on a basket of active products and on a single reference product.

do not consider that the introduction of dark fibre would lead to higher prices of wholesale services used to support voice and broadband services sold primarily to residential consumers. We will discuss these issues in the June 2015 LLCC Consultation.

9.90 We therefore propose that the dark fibre price should be based on an 'active-minus' approach, with reference to BT's 1Gbit/s wholesale Ethernet active access products (EAD and EAD LA).

Calculating the active-minus margin

9.91 Having decided that we should propose that the price of dark fibre should be calculated using the 'active-minus' approach, we considered two options for implementing such a pricing obligation: either calculating and specifying the value of the 'minus' up front; or allowing this value to change over time with the cost of the active elements, and providing guidance on how we would calculate the 'minus' at any given point in the event of a dispute. We propose to take the latter approach.

9.92 We consider that setting the value of the 'minus' as part of the charge control would in effect amount to setting a fixed differential between the passive products and the active products for the period of the charge control. Against that, guidance would give some flexibility to adjust the differential over time according to changes in the costs of the active elements.

9.93 The advantages of directly setting the value of the 'minus' for the next control period would be:

- providing access-seekers with certainty as to the price of passive access; and
- avoiding delays associated with resolving disputes between BT and CPs as to the appropriate access price.

9.94 The main advantages of providing guidance would be:

- giving BT time to assess in detail the specific equipment and activity costs that are avoided when it provides a passive rather than an active service, and ensuring that the passive product is designed to best meet industry needs; and
- allowing the access charge to be more flexible, potentially able to respond to changes in the cost of active inputs and perhaps product design or structure changes over time. This might be the case if the passive product design requires adjustment to best meet industry needs. For example, a need for adjustments to the design might become apparent during industry consultation prior to product launch.

9.95 While in principle directly setting the price of the 'minus' for the price control period would be preferable in terms of the stability it would provide, we consider that this is outweighed by the benefits of guidance in terms of flexibility. More specifically, we consider that with a new access product it is likely to be necessary to allow BT and the industry to agree minor changes to the product design as part of the industry consultation process pre-product launch. For example, we consider that BT should determine CPs' requirements for handover points, including any requests for interconnection and accommodation, during its implementation processes. Recognising that CPs may have various needs, we do not consider it appropriate to specify these requirements at this stage.

9.96 In order to allow some flexibility we are therefore proposing to provide guidance on how we would calculate the value of the 'minus', rather than set this up front.

9.97 In terms of efficiency incentive properties, it might be argued that, in theory, setting a fixed margin would have stronger incentive properties. In particular, given a fixed margin to cover active cost components, BT would have a profit incentive to reduce its active component costs. This is because BT would not be required to pass through any active cost component savings directly into the passive access price. In contrast, in the case of an 'active-minus' access price, cost savings in active components would be passed through to the passive access price. However, BT would retain an incentive to minimise input prices, as any such saving would be retained by BT in the form of a higher access price (due to a reduced 'minus' component relative to its downstream active price). For this reason, we consider that guidance would still provide strong incentive properties.

Legal tests

9.98 As noted above, we do not set out the proposed SMP conditions relating to pricing in Annex 6, and will set these out in the forthcoming June 2015 LLCC Consultation. Nevertheless, we consider it appropriate to set out how our proposed remedies would satisfy the relevant legal tests. We will consider the legal tests again in relation to the proposed SMP conditions in the June 2015 LLCC Consultation. We consider that our proposal to impose a dark fibre pricing condition requiring BT to provide dark fibre with reference to the active 1Gbit/s EAD variants would meet the relevant tests set out in the Act. For the reasons set out above and summarised below, we are also satisfied that our proposal to issue guidance on how the increment should be calculated would also meet the relevant legal tests.

9.99 We consider it would meet the criteria set out in section 47(2) of the Act, since it is objectively justifiable, non-discriminatory, proportionate and transparent. In particular, it would be:

- objectively justifiable in that BT has SMP in the market, and, in the absence of the charge control, it is unlikely to be incentivised to reduce its costs and set prices at the competitive level;
- not unduly discriminatory in that BT is the only operator to have SMP in the market;
- proportionate in that 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.

9.100 For the reasons set out above, we consider that it 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, it would promote competition in relation to the provision of electronic communications networks and encourage 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.

9.101 For the reasons set out above, we consider that our proposal to impose such conditions is appropriate to address the competition concerns identified, in line with section 87(1) of the Act.

The BEREC Common Position

9.102 We have also taken utmost account of the BEREC Common Position.[248] In particular in relation to achieving the objective of "fair and coherent access pricing" we have had regard to paragraphs BP30 to BP32. We consider that our proposals are consistent with the best practice set out in the BEREC Common Position.

Minimum requirements for reference offer

Current remedies in relation to active products

9.103 As set out in Section 8, BT is currently required to publish a Reference Offer (RO) in relation to the provision of network access. The RO must set out (at a minimum) such matters as the terms and conditions for provisioning, technical information, SLAs and SLGs, and availability of co-location. This obligation also prohibits BT from departing from the charges, terms and conditions set out in the RO. It also requires BT to comply with any directions Ofcom may make from time to time under the condition.

Aim and effect of the regulation

9.104 A requirement to publish an RO has two main purposes:

- 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.

9.105 This helps to ensure stability in markets as, without it, incentives to invest might be undermined and market entry less likely.

9.106 The publication of an RO would potentially allow for quicker 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.

Our proposals

Reference Offer

9.107 Section 87(6)(c) of the CA03 authorises the setting of SMP services conditions requiring the dominant provider to publish, in such a manner as Ofcom may direct, the terms and conditions on which it is willing to enter into an access contract.

[248] BoR (12) 126, BEREC common position on best practice in remedies imposed as a consequence of a position of significant market power in the relevant markets for wholesale leased lines, 26 November 2012, http://berec.europa.eu/files/document_register_store/2012/11/BoR_(12)_126_Draft_WLL_CP_2012.11.26.pdf

Section 87(6)(d) also permits the setting of SMP services conditions requiring the dominant provider to include specified terms and conditions in the RO. Finally, section 87(6)(e) permits the setting of SMP services conditions requiring the dominant provider to make such modifications to the reference offer as may be directed from time to time.

9.108 We consider that the requirement to publish ROs imposed in previous market reviews in relation to active products has been effective in meeting the aims of the regulation detailed above. Therefore, we propose that BT should be required to publish a RO for dark fibre products in the CISBO markets.

9.109 We consider that imposing a requirement to publish an RO is necessary in CISBO markets where we provisionally find BT to hold SMP. This remedy complements our proposals to impose network access in the form of dark fibre and non-discrimination requirements on BT to address the competition concerns arising from their SMP in each of the wholesale markets.

9.110 We propose that the proposed condition which requires the publication of an RO and specifies the information to be included in that RO (set out below) and how the RO should be published should also apply to DFA provision. The condition 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. We propose that the RO for dark fibre must set out (as a minimum) such matters as:

- a clear description of the services on offer, including technical characteristics and operational processes for service establishment, ordering and repair;
- the locations of points of network access and the technical standards for network access;
- conditions for access to ancillary and supplementary services associated with the network access including operational support systems and databases etc.;
- contractual terms and conditions, including dispute resolution and contract negotiation/renegotiation arrangements;
- charges, terms and payment procedures;
- service level agreements (SLAs) and service level guarantees (SLGs); and
- to the extent that BT uses the service in a different manner to CPs or uses similar services, BT is required to publish a reference offer in relation to those services.

9.111 In our view, requiring BT to publish a Reference Offer which includes SLAs and SLGs for dark fibre services would ensure clarity and certainty to the industry on the scope of BT's obligations. We do not consider, however, that it is appropriate to set minimum quality of service standards at this stage because a dark fibre product does not yet exist. In particular, we recognise that a further cross-industry discussion is necessary to specify some detailed requirements on the quality of service. At the same time, we also consider that the guiding principle in such negotiations should be that the quality of service arrangements applicable to dark fibre should be consistent with those applicable to Ethernet services where appropriate.

9.112 We do not expect that the performance achieved by Openreach in the delivery of active and passive services would be identical and recognise that the industry would need to agree a number of issues, including processes for fault repair. We nevertheless consider that the outcomes should be comparable, in particular to the extent they relate to the provision of the underlying fibre circuits.

9.113 We would envisage that dark fibre should replicate the existing arrangements in relation to the Ethernet services to the extent possible. We recognise that there could be objectively justifiable differences between active and passive products in terms of processes and systems. If this is the case then we would expect BT to identify such differences in a RO. In addition, in support of our proposal to require BT not to discriminate unduly, we would expect BT to provide an objective justification for any differences between dark fibre products and their corresponding active products.

9.114 The proposed requirement is intended to provide transparency of the key product specifications and processes. We are, therefore, seeking to ensure that sufficient information is provided to identify any material differences between active and passive provisioning, pricing and repair.

Implementation timetable

9.115 In response to the November Consultation stakeholders provided their views around implementation arrangements. We have summarised their responses in Annex 25. Those respondents in favour of passive remedies argued for timely implementation emphasising that passive remedies could be developed with very few changes to the existing processes. On the other hand, BT and Virgin Media stressed that there are considerable practical and logistical challenges that require addressing.

9.116 If we decide, following consultation, to require BT to provide dark fibre, BT would not be in a position to do so immediately because it would first need to develop appropriate dark fibre products.

9.117 In particular, before launching dark fibre products, BT's development would need to include:

- understanding the industry's detailed requirements,
- specifying the products accordingly, and
- adapting its processes and systems to enable it to deliver the products.

9.118 We recognise that finalising the specification of the products would require negotiations between Openreach and CPs, and that without intervention those negotiations could become protracted and result in uncertainty. We propose to address the risk in two ways.

9.119 First, we propose that the OTA2 should facilitate the negotiations.

9.120 Second, in order to avoid undue delay and to provide certainty and transparency, we propose to identify key milestones in the development of the products and to set dates by which BT would be required to meet them.

9.121 We consider that the following milestones would be appropriate:

- publication of a draft RO, which would provide a checkpoint to allow CPs and us to monitor BT's progress towards a firm RO;
- publication of final RO, which would provide certainty to CPs about the specification of the products, enabling them to plan and prepare for their use; and
- launch of dark fibre products, which would provide certainty to CPs as to when the products would be available.

9.122 As pointed out by BT, the magnitude of the systems and process issues in relation to the introduction of passive remedies would depend on the specification of the remedies and anticipated volumes. In this respect, we note that our proposals draw extensively on the current arrangements. This should minimise the required effort by both CPs and BT. In our view, therefore, implementing dark fibre would not require a major reinvestment to restructure systems. We agree with the arguments put forward by many stakeholders that implementing the dark fibre remedy should not involve significant developments of new systems or processes but rather modification to the existing ones.

9.123 While our proposals for a dark fibre remedy allow BT to utilise the existing systems and processes applicable to the delivery of active services, we also recognise that the development of the dark fibre product would require some additional work and resources. In particular, this is likely to relate to:

- Process and systems development in order to accommodate ordering, provision, fault repair, billing and quality monitoring of dark fibre;
- Training of planners, engineers and service agents to ensure that they can operate the processes for dark fibre products; and
- Management and delivery of dark fibre products.

9.124 Having considered stakeholders' responses in light of our design proposals, we propose that the dark fibre remedy should be implemented and available within one year of the coming into force of any decision we make to impose the proposed dark fibre remedy. This view is based on our experience and our understanding of BT's development processes,[249] and is informed by the fact that our proposals draw extensively on the current arrangements for active products. This should minimise the required development effort, both by CPs and by BT. In our view, one year should give the industry sufficient time to agree detailed arrangements for the provision of dark fibre and then for BT to make the relevant changes to its systems and processes.

9.125 BT also argued that there are potential operational challenges if Openreach has to deal with the introduction of a new dark fibre product at the same time as it is focused on a programme to improve Ethernet service delivery. While we recognise that there

[249] [✂

✂]

may be some interaction and overlap between BT's programme to improve quality of services and the implementation of dark fibre, we consider that the significance of this impact is minimised by our proposals, which would align dark fibre with the existing active products. Also, we will discuss in the June 2015 LLCC Consultation our proposals to allow BT to recover the additional development costs it would incur as a result of introducing dark fibre products.

9.126 Although we recognise that BT would need to devote resources to develop its processes and systems for dark fibre, we consider that such developments would largely be confined to adaptations of existing processes and systems, rather than substantial development of new ones. Similarly, we are not aware of any technical barrier to the development. We therefore consider that allowing BT to recover its reasonable development costs should be sufficient to put BT in a position to overcome any potential operational challenges in delivering the dark fibre product in the proposed timescales.

Table 9.2 Proposed implementation timetable

Milestone	Date
Proposed obligations come into effect	Beginning of Month 1
Publication of draft RO	within 4 months
Publication of final RO	within 7 months
Launch of dark fibre products	within one year

9.127 Our strong preference is that BT should reach agreement with CPs on any necessary terms of the RO. However, based on experience with implementation of other remedies, we consider that there is a risk that BT and CPs may not be able to reach agreement about the charges and other aspects of the dark fibre services. If necessary, we would consider any matters not agreed during the review period and consult on a direction to settle such matters.

Legal tests

9.128 For the reasons set out above and summarised below, we are satisfied that the proposed condition (as set out in Annex 6) meets the relevant tests set out in the Act.

9.129 We consider that the proposed condition satisfies our duties under section 3, and all the Community requirements set out in section 4, of the Act.

9.130 The requirement to publish a Reference Offer will, in combination with a requirement not to discriminate and/or discriminate unduly, facilitate service interoperability and allow CPs to make informed decisions about future entry into the relevant market. Further, the obligation will enable buyers to adjust their downstream offerings in competition with BT in response to changes in BT’s terms and conditions. Finally, the obligation will make it easier for Ofcom and other CPs in the relevant market to monitor any instances of discrimination. Therefore, we consider that the condition in particular furthers the interests of consumers in relevant markets by promoting competition in accordance with section 3 of the Act.

9.131 We also consider that the condition meets the Community requirements set out in section 4 of the Act. In particular, the condition promotes competition and encourages the provision of network access and service interoperability for the purpose of securing efficiency and sustainable competition for the maximum benefit for consumers. The publication of a RO will mean that other CPs will have the necessary information readily available.

9.132 Section 47 of the Act 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, provide stability in markets and allow monitoring of anti-competitive behaviour;
- not unduly discriminatory in that it is proposed only for BT and no other operator has been found to hold a position of SMP in these markets;
- proportionate in that only information that is considered necessary to allow providers to make informed decisions about competing in downstream markets is required to be provided; and
- transparent in that it is clear in its intention to ensure that BT publishes details of its service offerings.

9.133 Article 9(4) of the Access Directive requires that where network access obligations are imposed, NRAs shall ensure the publication of a reference offer containing at least the elements set out in Annex II to that Directive – we are satisfied that this requirement is met.

9.134 For the reasons set out above, we consider that the proposed conditions are appropriate to address the competition concerns identified, in accordance with section 87(1) of the Act.

The BEREC common position

9.135 In forming these proposals we have also taken utmost account of the BEREC Common Position.[250] In particular, in relation to the objective of achieving transparency we have had regard to paragraph BP16. In relation to service quality characteristics (operational aspects) we have had regard to paragraphs 22 and 23. We consider that our proposals are consistent with the best practice set out in the BEREC Common Position.

[250] BoR (12) 126, BEREC common position on best practice in remedies imposed as a consequence of a position of significant market power in the relevant markets for wholesale leased lines, 26 November 2012, http://berec.europa.eu/files/document_register_store/2012/11/BoR_(12)_126_Draft_WLL_CP_2012.11.26.pdf

Proposals regarding transparency as to quality of service

Current remedies in relation to active products

9.136 BT is currently subject to a requirement to publish such quality of service information that Ofcom may from time to time direct.[251] This SMP condition was imposed in BCMR 2013 as a general remedy to enable Ofcom to direct BT to publish quality of service information for the purposes of providing transparency of the quality of service provided by BT to its own retail divisions and that provided to other CPs.

9.137 We have set out in Section 8 that we propose not to re-impose this SMP condition.

Aim and effect of the regulation

9.138 In competitive markets the quality of service of leased lines services would be based on the commercial judgement of individual companies and could be expected to meet the requirements of end-users of the services, as providers would be incentivised to meet customer requirements in order to maximise sales. However, where a provider has SMP, competition cannot be expected to be an effective constraint and the dominant provider would have the ability and incentive to offer inadequate quality of service in order to increase profitability.

9.139 In addition, vertically integrated SMP operators have the ability to favour their own downstream business over third party CPs by differentiating on price or terms and conditions. This discrimination can also take the form of variations in quality of service (either in service provision and maintenance or in the quality of network service provided by the dominant provider to external providers compared to its own retail operations). This has the potential to distort competition at the retail level by placing third party CPs at a disadvantage in terms of the services they can offer consumers to compete with the downstream retail business of the vertically integrated operator.

9.140 *Ex ante* regulation may therefore be desirable to provide transparency about the quality of service provided by a dominant provider.

Our proposals

9.141 Section 87(3)(a) of the Act authorises the setting of SMP services conditions which require a dominant provider to give such entitlements as Ofcom may from time direct, as respects the provision of network access to the relevant network. Section 87(5)(b) provides that such conditions may include provision for securing that the obligations contained in the conditions are complied with within the periods and at the times required by or under the conditions. Section 87(6)(b) further provides that such SMP conditions may also include a condition requiring the dominant provider to publish, in such manner as Ofcom may from time to time direct, all such information as they may direct for the purposes of securing transparency in relation to such matters.

9.142 As we have set out in Section 13, we propose that BT should be subject to a new requirement to comply with all such quality of service requirements as Ofcom may from time to time direct in relation to network access provided by it pursuant to our proposed conditions requiring BT to provide network access and/or specific forms of network access. We are proposing to issue a direction pursuant to this new SMP

[251] SMP Condition 8 imposed on BT in BCMR 2013.

services condition requiring BT to publish specific quality of service information In relation to the wholesale CISBO markets.

9.143 In this sub-section, we set out our proposals to also direct BT to provide quality of service information in the form of key performance indicators on dark fibre once it is launched. In order to ensure that we able to monitor performance outcomes as between active and passive remedies to complement our proposed measures to address potential discriminatory behaviour, we propose that a set of service KPIs for dark fibre should be consistent with those for Ethernet services.

9.144 In line with our proposals for Ethernet, we propose that BT provide a set of service KPIs intended to provide visibility to its customers as to the performance achieved by Openreach in terms of key aspects of service delivery – namely, how long it takes for dark fibre services to be installed, delivery date certainty and fault repair performance.

9.145 Table 18 in Section 13 sets out the KPIs we are proposing to require BT to provide in relation to its Ethernet products. We recognise that not all of Openreach KPIs for Ethernet will map directly onto the dark fibre product. In particular, we consider that the provisions relating to fault repair performance will need to be modified based on the industry agreement during the implementation process. In addition, we also do not consider that Cablelink Mean Time To Provide (MTTP) is relevant to the provision of dark fibre.

9.146 In order to ensure compliance monitoring and transparency to complement our proposed measures to address potential discriminatory behaviour, including between the provision of active and passive services, we also consider that BT should make the KPIs for dark fibre available in the same format and on the same terms as the KPIs for Ethernet services unless specified otherwise. In this respect, we do not propose to require that the dark fibre KPI values be split by region and or that they should be published on a BT publicly accessible website. At this stage, we consider that these requirements would not be necessary to achieve our objective of transparency or to address discriminatory behaviour.

9.147 We propose that the reporting obligations come into force six month from the dark fibre launch date. The proposed condition is set out in full in Annex 7

Legal tests

9.148 We have set out in Section 13 our reasons as to why we consider the proposed SMP services condition regarding quality of service meets the relevant tests set out in the Act.

9.149 For the reasons set out below, we are further satisfied that the proposed KPI Direction (as notified and set out in Annex 7) meets the relevant tests set out in the Act.

9.150 We consider that the proposed KPI Direction we are making in the wholesale CISBO markets excluding the CLA and Hull area, meets our duties in the Act including our general duties under section 3, and all the Community requirements set out in section 4, of the Act. In particular, the proposed direction is aimed at promoting competition and securing efficient and sustainable competition for the maximum benefit of consumers by ensuring that providers have visibility of the quality of service that BT provides.

9.151 Section 49 of the Act requires that we must be satisfied that our proposed directions are objectively justifiable, non-discriminatory, proportionate and transparent. We consider that the KPI Direction is:

- objectively justifiable in that it aims to provide transparency as to the quality of service performance by BT which we consider, in light of our provisional review of the dominant provider's past performance, is justifiable in terms of a necessary entitlement to access-seekers in relation to the provision of network access (in particular Openreach's performance in the speed and certainty in its provision of dark fibre services to CPs). We also consider that such transparency requirements are justified as a necessary element in our aim of preventing undue discrimination in the provision of service and to ensure that BT offers adequate quality of service;

- not unduly discriminatory, as it is proposed only for BT and no other operator has been provisionally found to hold a position of SMP in these markets;

- proportionate because it only requires BT to publish the minimum information we consider is required to effectively monitor BT's quality of service performance; and

- transparent in that it is clear in its intention that BT is required to publish quality of service information.

9.152 For the reasons set out above, we consider that the proposed KPI Direction is appropriate to address the concerns we have identified and in line with section 87 of the Act.

The BEREC common position

9.153 In forming these proposals we have also taken utmost account of the BEREC Common Position, in particular the contents of BP24 in relation to the objective of achieving a reasonable quality of access products.[252]

9.154 We therefore consider that our proposals are consistent with the best practice set out in the BEREC Common Position.

Consultation questions

Question 9.1: Do you agree with our proposals in relation to the dark fibre remedy? If not, what alternative dark fibre remedy would you propose and why?

Question 9.2: Do you agree with our proposals in relation to the pricing of dark fibre? If not, please explain why, and what alternative approach you consider we should take.

[252] BoR (12) 126, BEREC common position on best practice in remedies imposed as a consequence of a position of significant market power in the relevant markets for wholesale leased lines, 26 November 2012, http://berec.europa.eu/files/document_register_store/2012/11/BoR_(12)_126_Draft_WLL_CP_2012.11.26.pdf

Section 10

Specific remedies for the CISBO markets – active remedies

Introduction

10.1 In this section we set out the specific remedies that we propose to impose on BT in the following markets:

- the wholesale market for Contemporary Interface Symmetric Broadband Origination (CISBO) in the London Periphery (LP); and
- the wholesale market for CISBO in the Rest of the UK (RoUK) excluding the Hull area.

10.2 Unless otherwise stated, we refer to these markets collectively as the CISBO markets.

10.3 These remedies are in addition to the proposed general remedies for these markets discussed in Section 8.

Summary of proposals

10.4 Table 10.1 summarises the specific remedies that we propose to impose on BT in the wholesale CISBO markets.

Table 10.1: Summary of proposed specific remedies for BT by wholesale market

Wholesale market	Proposed remedies
Wholesale CISBO in the RoUK excluding the Hull area Wholesale CISBO in the London Periphery	– Requirement to provide specific types of Ethernet service o Disaggregated Ethernet access and backhaul segments o Short range end-to-end Ethernet services – Requirement to provide specific types of WDM service o End-to-end WDM services o Backhaul services – Price control – basis of charges condition for EAD Local Access services

10.5 We consider these remedies are necessary to address the competition problems summarised in Section 7, in particular: refusal to supply, and price and non-price discrimination.

10.6 We consider that these remedies would achieve our statutory duties and would satisfy the relevant legal tests. In reaching these proposals, we have also taken account of our regulatory experience from the two previous market reviews, recent

developments in these markets, views expressed by stakeholders in response to the April 2014 CFI and expected developments over the course of the review period of three years.

Assessment of appropriate remedies

Current remedies

10.7 BT is currently subject to the following specific network access obligations in relation to wholesale Ethernet and WDM services:

- a requirement to provide disaggregated wholesale Ethernet access and backhaul segments;
- a requirement to provide short range end-to-end wholesale Ethernet services;
- a requirement to provide end-to-end wholesale WDM services; and
- a requirement to provide wholesale WDM backhaul segments.

10.8 In Annex 16 we have provided a summary of the current wholesale remedies and a description of the wholesale leased lines services that BT currently offers.

Developments since the 2013 Review and stakeholders comments

10.9 Based on our analysis of developments since the 2013 Review and stakeholders comments we have considered in particular the following issues in relation to the specific remedies that we currently apply in the AISBO markets:

- Support for WDM interconnection – we have considered the extent to which CPs can interconnect WDM terminating segments and the implications for competition and the specific remedies we currently apply in the AISBO markets.
- Ethernet pricing differentials – we have examined the pricing of EAD and EAD Local Access (EAD LA) services in light of different patterns of use of these services by BT and CPs.
- Excess Construction Charges (ECCs) – we have reviewed the impact of the amended charging structure for ECCs that BT introduced in May 2014 and have also considered stakeholders comments about cost recovery.
- Project Services – we have undertaken further analysis of Openreach's Project Services project coordination and management service in light of concerns raised by stakeholders.
- Trunk Segment and Trunk Aggregation Node definitions – in light of our proposal to define a larger competitive CI core market we are proposing to amend the definitions of Trunk Segments and Trunk Aggregation Nodes in the Conditions to reflect the revised market definition.

Support for WDM interconnection

10.10 Interconnection plays an important role in wholesale leased lines markets, enabling CPs to connect terminating segments rented from BT to their own networks in order

to provide end-to-end downstream services. Interconnection therefore reduces the barriers to entry and expansion by CPs who compete with BT. It allows CPs to concentrate their investment in networks mainly along trunk and backhaul routes, in which they can aggregate traffic from many services and share the costs of their core infrastructure among those services, while relying on BT's ubiquitous network to provide access to customer sites.

10.11 In the 2013 Review we found that there were significant differences in the extent to which CPs interconnect using BT's wholesale Ethernet services and wholesale WDM services. In particular, we found that CPs were able to interconnect BT's wholesale Ethernet services with their own networks to build end-to-end retail services, but did not do so to a material extent with BT's wholesale WDM services. This was both because interconnection of WDM services could be costly and because available technology had not, until recently, allowed CPs to assure reliability of the resulting service to the level often required by the end-user. Given these limitations, CPs generally rented end-to-end wholesale WDM services from BT in cases where they were not able to provide end-to-end services on their own networks or used dark fibre leased from other suppliers.

10.12 We noted that Openreach had recently introduced Optical Transport Unit (OTU)[253] interface options for its OSA and OSEA WDM products.[254] These provided additional support for interconnection by facilitating end-to-end monitoring of interconnected circuits.[255] However, at that time, the extent to which CPs would use OTU was unclear.

10.13 In April 2014 Openreach introduced a 'friendly alien wavelength' interface option for the Ciena 6500 variant of its OSEA product. This provides additional support for interconnection by facilitating direct optical interconnection without any intermediate equipment. Currently this option is available for 40Gbit/s and 100Gbit/s wavelengths and CPs must also use Ciena 6500 WDM equipment.[256]

10.14 In our view, the extent to which these enhanced interconnection options will lead to an increase in WDM interconnection remains uncertain. Whilst we note that some CPs contributed to Openreach's development of OTU interfaces, suggesting that they were considering using it in future, the availability of the OTU interfaces has not yet led to a significant increase in WDM interconnection. It is too early to assess whether friendly alien wavelength interconnection may provide a more effective method of interconnection. However, our current view is that usage is likely to be small at least in the short term as demand for 40Gbit/s and 100Gbit/s circuits is currently very low. Also the requirement for CPs to use the same vendor's equipment as BT may further limit usage.

10.15 We consider that it is important that BT should continue to support WDM interconnection options, such as OTU and alien friendly wavelengths. However, in view of the uncertainty about these options we consider that it remains unclear how well they will facilitate CPs' ability to interconnect WDM services.

[253] In the 2013 Review we referred to these interfaces as Optical Transport Network (OTN) – the name of the family of standards of which OTU is part.
[254] Openreach introduced OTU interface options for the OSEA WDM product in April 2011 and the OSA WDM product in January 2012.
[255] We provide a description of the OTU interface standards in Annex 16.
[256] We provide a more detailed description of the 'friendly alien wavelength' option in Annex 16.

10.16 As we discuss in more detail in Section 9, we are proposing to impose a dark fibre remedy in the CISBO markets. CPs using a dark fibre service would not require WDM interconnection as they would be able to build end-to-end fibre circuits suitable for WDM services using dark fibre terminating segments rented from BT and their own fibre core networks. However, as we also discuss in Section 9, the proposed dark fibre remedy would take some time to implement and become established. Therefore CPs will continue to rely on wholesale WDM services for some time to come. We therefore consider that it is important that BT continues to supply WDM services, but in light of the proposed dark fibre remedy, we do not propose to introduce a new WDM interconnection obligation.

10.17 In light of these considerations we are not proposing to introduce specific obligations in relation to WDM interconnection and our proposed approach is to maintain the existing specific network access obligations relating to WDM services which require BT to supply end-to-end wholesale WDM services (thereby allowing CPs to offer these services without interconnection) and to provide WDM backhaul.

Ethernet pricing differentials

10.18 In the 2013 Review we reported that the EAD LA variant of BT's EAD service had created a strong incentive for CPs to locate their Points of Presence (POPs) in BT local exchanges designated by BT as Access Serving Nodes (ASNs) because EAD LA offered significantly lower tariffs than other EAD services (EAD and EAD Extended Reach). At that time, the implications of this development were not clear and we have therefore reviewed developments since the 2013 Review.

10.19 The main difference between the variants is that EAD LA is only available for circuits with one end terminating at ASN exchanges whereas EAD and EAD Extended Reach may be used to connect any two locations (including BT exchanges) subject to circuit distance limits.

10.20 Although EAD LA is available to all CPs on an EOI basis, we have found that BT now uses proportionately more EAD LA than other CPs. Table 10.2 shows that EAD LA comprises 42% of internal CISBO circuit rentals (to BT downstream divisions) compared with 25% of circuits rented by other CPs.

Table 10.2: Summary of internal and external CISBO circuit rentals

Circuit type	Internal circuits	External circuits
EAD Local Access	42%	25%
EAD other (EAD & EAD Extended Reach)	25%	34%
WES	24%	29%
BES	0%	6%
EBD	7%	4%
OSA & OSEA	2%	2%

Source: Ofcom summary of sections 8.7 to 8.9, 2013/2014 BT RFS

10.21 These differences suggest that EAD LA is better suited to BT's requirements than other CPs. This may be because ASNs are the nodes that BT has designated for

backhaul aggregation and which are served by its principal backhaul service EBD. In contrast, other CPs are more likely to have aggregation nodes in different locations and to require different backhaul routings to BT. As Table 10.2 shows, other CPs make proportionately less use of EBD than BT.

10.22 Where significant differences emerge in the usage of regulated products, there is a potential for BT to discriminate in favour of its own operations by setting prices so as to favour the services it consumes proportionately more than its competitors.

10.23 BT's product definition and pricing structure results in a substantial pricing differential between the two variants of the EAD service for similar circuit configurations. Table 10.3 below shows the charges for 1Gbit/s EAD and EAD LA circuits for 1 and 5 year contracts.

Table 10.3: EAD and EAD LA 1Gbit/s charges[257]

Annual charges (excluding VAT)	EAD	EAD LA
Connection charge	£2,100	£2,050
Rental charge (1 year contract)	£5,664	£4,400
Rental charge (5 year contract)	£5,625	£3,600
Main link charge (per km)	£37.20	Not applicable

10.24 This pricing structure means that CPs who do not use ASNs as aggregation points (and who must therefore use EAD rather than EAD LA) pay higher charges for comparable circuit configurations. In particular, a CP purchasing an EAD circuit connecting its POP in a non-ASN BT exchange to a customer site in the same exchange area would pay at least £1,264 per year more than a CP purchasing a comparable EAD LA circuit (i.e. connecting an ASN to a customer site in the ASN exchange area).

10.25 Our analysis also indicates that BT's returns for 1Gbit/s EAD are significantly higher than for EAD LA as illustrated in Table 10.4 below.

[257] Prices applicable from 1 April 2015.

Table 10.4: Comparison of prices and costs of EAD and EAD LA

	EAD LA 10Mbit/s	EAD LA 100Mbit/s	EAD LA 1Gbit/s	EAD Other 10Mbit/s	EAD other 100Mbit/s	EAD other 1Gbit/s
Average price	£2,654	£2,113	£4,848	£3,529	£3,008	£7,921
FAC	£2,041	£2,099	£2,856	£2,941	£3,109	£4,304
DLRIC	[£✂]	[£✂]	[£✂]	[£✂]	[£✂]	[£✂]
Markup over FAC	£613	£14	£1,992	£589	-£101	£3,617

Prices and costs annualised per-circuit, based on connection and rental over 3 year term, external sales. EAD other includes EAD and EAD Extended Reach.

Source: price, FAC Ofcom summary of section 8.7, BT 2013/2014 RFS, DLRIC BT updated response dated 23 April 2015 to question I3 of the 1st LLCC s135 notice dated 7 August 2014

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10.26 These pricing differences give rise to two concerns, firstly that CPs may face higher costs than BT because they consume proportionately more EAD than BT, and secondly that CPs will be incentivised to make network design choices that are not efficient, e.g. to locate POPs in BT's ASNs when other locations would be more efficient or equally as efficient.

10.27 In view of these concerns, we consider that BT should be required to ensure that the differences in EAD and EAD LA reflect differences in long-run incremental costs. This would ensure that the choice between the two products is productively efficient as it would be based on differences in the underlying costs of provision. Price differentials equal to incremental cost differentials means that purchasers face incentives to use the service which minimises total costs, and in addition means that the amount of common costs recovered per line should be the same for a given bandwidth of circuit.

10.28 Setting the price difference between EAD LA and EAD equal to LRIC would also reduce the risk of excessive pricing or undue discrimination by BT and address the risk that BT recovers more common costs from non-Local Access variants, which are proportionally more important to its competitors.

10.29 We therefore propose to impose a 'basis of charges' condition, which would require the rental and connection charges of EAD to be set by reference to the rental and connection charges for EAD LA, adjusted to reflect the difference in the long run incremental costs of EAD. We further propose to require that BT assess the differential on a bottom-up basis, rather than by reference to regulatory financial statements, and that the differential be assessed using financial information from the preceding year. We propose that this requirement should apply from the second year of the charge control period to enable BT to adjust prices in the first year.

Legal tests

10.30 The proposed condition for EAD will need to reference the charge control conditions that we are preparing for EAD services. We will therefore include the notification and legal tests for the proposed condition in the June 2015 LLCC Consultation. Nevertheless we consider that in principle the proposed condition would satisfy the relevant legal tests in the Act as set out below.

10.31 Section 87(9) of the Act authorises the setting of an SMP services condition setting price controls for network access and relevant facilities. Section 88 of the Act

specifies that Ofcom are not to set a price control unless it appears to Ofcom that there is a risk of adverse effects due to pricing distortions and it appears to Ofcom that setting a price control would promote efficiency, sustainable competition and confer the greatest benefits on the end users.

10.32 A price control can take a variety of forms, including but not limited to a charge control, basis of charges and/or safeguard cap.

10.33 We consider that the proposed condition satisfies the requirements of section 88(1) of the Act. Our analysis indicates that there is a risk of adverse effects arising from price distortion, specifically that BT might fix and maintain its prices for EAD services at an excessively high level. For the reasons discussed above, we consider that the proposed condition would promote efficient and sustainable competition.

10.34 We consider that the imposition of the proposed condition to prevent pricing distortions would in particular further the interests of citizens and further the interests of consumers in relevant markets by the promotion of competition, in accordance with section 3 of the Act. Further, we consider that, in accordance with section 4 of the Act, the proposed condition would promote 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.

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

- objectively justifiable, in that BT has SMP in these markets and we consider it is unlikely to be incentivised to reduce set prices at the competitive level;
- not unduly discriminatory, in that BT is the only operator to have SMP in these markets;
- proportionate, in that 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; and
- transparent, in that the condition, when we formulate our detailed proposals, will be clear in its intention.

Excess Construction Charges

10.36 Excess Construction Charges (ECCs) are levied by BT to recover the costs of customer-specific network construction work in association with a new connection. ECCs cover activities such as a site survey, the installation of new duct, new blown fibre and drilling through walls.[258] ECCs are charged in addition to normal connection charges.

[258] Only those elements that are unique to a single end-user site are chargeable as ECCs. Construction work that forms part of Openreach's common network (i.e. can serve more than one end-user site) falls outside the scope of ECCs. ECCs are also incurred if the customer requests a method of delivery which is not Openreach's first choice or if an additional circuit is required for resilience purposes.

Developments since the 2013 Review and stakeholders' comments

10.37 BT made changes to the charging arrangements for additional construction work on 1 June 2014. New provisions of EAD services were exempted from the first £2,800 of ECCs. This was funded by increasing the standard connection charge for all EAD orders by £548. Following a consultation, we issued Directions in our May 2014 Statement[259] amending the current charge control to enable BT to make this change. Most CPs supported our decision to allow BT to introduce the new charging arrangements.

10.38 In their CFI responses, Vodafone and Virgin urged Ofcom to monitor ECCs, including the impact of the new charging arrangements on competition. Vodafone also questioned whether BT extends its network in the most efficient manner. It added that BT should not be permitted to recover all of the cost of ECCs as it benefits from network expansion.

10.39 BT's main rationale for the change in charging policy was to simplify part of the provisioning process. It was anticipated that removing the requirement to seek end-customer approval for an ECC charge (from the majority of connections which previously incurred the charge) could lead to a reduction in average lead times and fewer cancellations of EAD orders.

Our assessment

10.40 We have sought information from BT about the impact of the new charging arrangements. BT reported that, by the end of October 2014, the number of orders subject to a direct ECC charge had fallen from 30% to 8%. The cancellation rate within 25 days has also fallen as anticipated. BT noted a steep reduction in 'deemed consent' delays associated with the Deemed Consent code 'awaiting customer approval for ECCs' (DC21) from 663 delays totalling 8,573 working days in May 2014 to 94 delays totalling 558 working days in October 2014.

10.41 BT has stated that the impact of the ECC changes upon average lead times is harder to assess, because it is influenced by many other factors. However, we note that the significant reduction in 'deemed consent' delays associated with ECCs might be expected to either reduce lead times or to bring more of the residual provisioning delays within BT's responsibilities to pay compensation for delays under the SLG requirements. We will continue to monitor the impact of the ECC charging changes on provisioning lead times.

10.42 As we explained in our May 2014 Statement, we consider that the changes in charging arrangements are unlikely to have had a material detrimental impact upon infrastructure competition. Our analysis suggests that the change would increase connection charges for 72% of EAD orders (these orders would have incurred either no ECCs or ECCs of less than the £548 balancing charge). All else being equal, this should make it easier for infrastructure CPs to compete for these orders. While potential competitors may find it more difficult to compete for the 28% of 'high ECC' orders where there is a net reduction in total price, our analysis suggests these connections are more likely to fall in areas where there is limited alternative

[259] Ofcom, *Excess Construction Charges for Openreach Ethernet Access Direct – Directions affecting the operation of the Leased Lines Charge Control*, 16 May 2014. http://stakeholders.ofcom.org.uk/consultations/excess-construction-charges/, Annex 1.

infrastructure (we found that in FY2012/13 the proportion of orders requiring ECCs in excess of £2,800 outside London was twice that in London).

10.43 With regard to Vodafone's concerns about efficient network expansion, we consider that our controls provide BT with incentives to expand its network efficiently. BT recovers the costs of its network expansion either through connections and rentals (where network expansion costs are capitalised and BT earns a return on capital), or through ECCs where BT recovers the expansion cost upfront from CPs, but earns no cost of capital. As BT's return should be the same in each case, it should not have incentives to favour one method of recovery over another. We also note that as the first £2,800 of ECCs are included within the connection charge, the burden of ECCs is shared more effectively between all customers.

10.44 With regards to Vodafone's suggestion that BT should not be permitted to fully recover ECC costs, we acknowledge that BT may derive some benefit from the ownership of the assets created. However, ECCs are in effect connection costs as they relate to customer specific network extensions that are made in order to fulfil specific orders. We consider it is appropriate that BT should fully recover ECC costs and if we were not to allow it to recover these costs in full, BT would be denied the opportunity to recover its costs. We also note that in the March 2013 BCMR Statement we concluded that BT should not capitalise ECC expenditure and consequently BT does not earn a return on assets created using ECCs.

10.45 We will address the future charging arrangements for ECCs and the design of the charge control for ECCs in the forthcoming June 2015 LLCC Consultation.

Project Services

10.46 Project Services is a project coordination and management service offered by Openreach to CPs and which it provides on an EOI basis. In the 2013 Review we concluded that Project Services should be regarded as a provisioning option when purchased in connection with wholesale leased lines services, and hence it is subject to the SMP conditions applicable in the wholesale leased lines markets, including a requirement not to discriminate unduly and an obligation to provide the service on an EOI basis.

April 2014 CFI responses

10.47 In their responses to our April 2014 CFI, TalkTalk and Virgin raised concerns about Project Services:

- TalkTalk argued that Project Services is an SMP service and that Openreach had been successful in driving usage of Project Services through the inappropriately low quality of service which it offers on the basis of its standard charges. TalkTalk argued Project Services fees should be brought within the scope of the leased line charge controls.

- Virgin said that poor quality of service had led it to incur additional costs by purchasing Project Services from Openreach to ensure increased visibility for its orders.

Our analysis

10.48 In view of the concerns we have obtained further information from Openreach about Project Services, including details of the services supplied, customer case studies and internal processes.

Our assessment

10.49 The data we collected as part of our quality of service research (see Annex 17) shows there has not been a sustained increase in the proportion of overall orders which are part of a Project Services order, although there was a temporary rise in 2013. We also note that the largest purchasers of Project Services are downstream BT divisions with low levels of Project Services orders from non-BT CPs.

10.50 Furthermore, the data collected does not suggest that Openreach's performance on provisioning is superior where the CP pays for Project Services. The majority of Project Services orders were subject to a change in Contractual Delivery Date between August 2013 and July 2014 (see Annex 17). We also found that Project Services orders have generally been subject to longer average delays between order validation and actual delivery date than the average delay for non-Project Services orders.

10.51 However, this data needs to be placed in context. We understand that Project Services is more likely to be commissioned for more complex and/or larger orders. So these orders may be at greater inherent risk of provisioning delays, sometimes partly driven by the end-customer desire to coordinate multiple circuit installations. We have thus sought further information from Openreach and the Equality of Access Office (EAO) to assess whether potential risks of discrimination associated with Project Services are appropriately managed.

10.52 The Equality of Access Board Annual Report 2014[260] stated that its 'extensive investigation and analysis' found no significant indications of non-compliance with the EOI Undertakings. The EAO has subsequently confirmed that its investigation had found no evidence that staff within Openreach had unduly influenced their colleagues working on provisioning to expedite orders. BT's general product descriptions make clear that Project Services is not an expedite service and is not a means of fast tracking defined standard order processes or to place orders on behalf of the CP.

10.53 The concerns about Project Services have arisen in the context of the problems with Openreach's provisioning quality of service. In our view it would not be acceptable for Project Services to be developed or positioned as an essential service which CPs need to purchase to get their orders prioritised and/or expedited while provisioning performance for standard orders deteriorates.

10.54 A key priority of this review is seeking improvements in Openreach's provisioning performance which we address in detail in Section 13. If CPs have confidence in the standard order process then they are less likely to consider they are obliged to buy Project Services to secure a satisfactory service. They will only choose Project Services if it provides an added-value to them, such as coordination of a large number of orders.

[260] BT Group plc, *Equality of Access Board Annual Report 2014*, https://www.btplc.com/Thegroup/Ourcompany/Theboard/Boardcommittees/EqualityofAccessBoard/Publications/EAB_Annual_Report_2014.pdf, page 19.

10.55 Even if the standard order process is satisfactory, some end-customers and CPs with large orders may have a residual need for a project management service, which is not relevant to other end-customers and CPs seeking individual connections. We therefore see the rationale for Project Services being offered and priced as an optional 'add-on' for a subset of orders, rather than the costs being absorbed within the charges that apply to all new connections.

10.56 Some CPs may offer similar generic project management/coordination services as part of their proposition to end-customers with large orders. We welcome Openreach's 'Clarity Update Trial' which is testing new procedures that will provide CPs with more detailed and up-to-date information with order progress. This should provide CPs with information which is currently easily accessible to Project Services staff (as employees of Openreach), potentially enhancing CPs ability to offer updates and alternative project co-ordination services to end-customers.

10.57 However, we consider that CPs would not be able to fully replicate the Project Services proposition for wholesale leased lines as they do not have access to the Openreach systems and personnel that Project Services is able to draw upon. So we continue to view it as a provisioning option when purchased alongside a regulated Ethernet service rather than as a downstream activity.

10.58 We do not consider that a charge control for Project Services would be particularly effective given the bespoke nature of the service, which is charged on the basis of the day rates of Project Services staff.

10.59 In summary, we consider that our primary focus should on the quality of Openreach's standard provisioning process which is relevant to all CPs and end-customers, rather than taking a prescriptive approach to regulating Project Services. We therefore do not propose to implement specific remedies for Project Services. We discuss our proposals concerning quality of service in Section 13.

Requirement to provide specific types of network access

10.60 In light of our analysis in Section 4, we propose to require BT to provide specific types of network access in each of the CISBO markets. This remedy is in addition to the general remedies that we have discussed in Section 8.

Aim and effect of the proposed regulation

10.61 The proposed obligations are intended as a complementary remedy to the proposed network access obligation. They require BT to provide specific types of network access that are widely used by CPs. In the absence of regulation, BT could have an incentive to withdraw or to no longer supply these products. CPs have developed their business models around the availability of these products. It would be disruptive to CPs and would reduce competition if they were no longer available.

10.62 The obligations to provide disaggregated Ethernet access and backhaul segments are intended to facilitate competition in backhaul by allowing CPs to aggregate different types of traffic at BT local exchanges or other POPs. Short range end-to-end services provide a more efficient solution for short range services than constructing services using terminating segments.

10.63 The obligations to provide Ethernet and WDM backhaul are also intended to facilitate competition in downstream broadband, telephony and mobile markets for which these services are an important input.

Proposed remedies

10.64 We propose that BT should be subject to an obligation requiring it to provide the following types of wholesale services:

- a requirement to provide disaggregated wholesale Ethernet access and backhaul segments;
- a requirement to provide short range end-to-end wholesale Ethernet services;
- a requirement to provide end-to-end wholesale WDM services; and
- a requirement to provide wholesale WDM backhaul segments.

10.65 These conditions explicitly exclude Trunk Segments. As we discuss below we have amended the definition of Trunk Segments and Trunk Aggregation Nodes (TANs) in the conditions to reflect the revised market definition which defines a larger competitive CI core market.

Amendments to CISBO Trunk Segment and Trunk Aggregation Node definitions

10.66 As we have discussed in more detail in Section 4, we have reviewed our definition of the boundary between the trunk segments and terminating segments, and are proposing to define a larger competitive CI core market. This boundary is currently delineated by a set of core node groupings known as TANs, each comprising one or more BT exchanges. Circuits between nodes in different TANs are defined as trunk segments and fall outside the wholesale CISBO markets, and consequently BT is not required to provide wholesale leased lines between such nodes.

10.67 Under the revised market definition we are proposing to define a larger CI core market by adding additional nodes to the existing TANs. Specifically we are proposing to add additional BT exchanges (termed Candidate Competitive Exchanges (CCE)) and competitive data centres.

10.68 We have revised the parts of the proposed conditions which define TANs and Trunk Segments to reflect the revised market definition. These definitions are referenced by two conditions in order to provide clarity about circuit routing rules:

- Condition 2 - specific forms of network access, which specifies the requirement to provide Ethernet access, backhaul and short range end-to-end services as discussed above; and
- Condition 4 – equivalence of inputs basis which we discuss in more detail in Section 8.

10.69 Our proposed changes to the definitions are as follows:

- Definitions in Part 2 of the conditions:
  - We have defined a new Term ‘Competitive Core Nodes’ to reflect the addition of data centres to the core boundary nodes.
  - We have added the Candidate Competitive Exchanges to the list of TANs in Table 3. The rationale for the grouping of nodes into TANs is discussed in Annex 20.

- We have defined a new term 'Data Centre Core Nodes' for the new data centre core nodes and have added a new table listing the data centres.

- We have revised the definition of Trunk Segments to refer to the newly defined Competitive Core Nodes.

10.70 The revised conditions are set out in full in Annex 6.

Legal tests

10.71 Section 87(3) of the Act authorises the setting of a SMP services condition requiring the dominant provider to provide such network access as we may, from time to time, direct.

10.72 When considering the imposition of such conditions in a particular case, we must take into account six factors set out in Section 87(4) of the Act, including:

- the technical and economic viability of installing and using other facilities, including the viability of other network access products, whether provided by the dominant provider or another person, that would make the proposed network access unnecessary;

- the feasibility of the proposed network access; and

- the need to secure effective competition, including where it appears to us to be appropriate, economically efficient infrastructure based competition, in the long term.

10.73 In proposing the specific network access obligations above, we have taken all these six factors into account.

10.74 The definition of access and the way in which we might assess reasonable demands for access are set out in the Access Guidelines. As discussed in our SMP assessment there are considerable sunk costs associated with building networks to provide leased lines services. We consider it unlikely to be economically viable or efficient to build competing access networks on a sufficient scale to provide an effective constraint on BT's SMP.

10.75 Therefore we propose that requirements to provide specific network access products are appropriate. They facilitate competition in downstream markets by enabling CPs to compete without the need to invest in a national network, an investment which we considered, on the basis of our market analysis, represented a structural barrier to entry and expansion in the CISBO markets. Consequently, we consider these requirements to be necessary for securing effective competition, including economically efficient infrastructure based competition, in the long term.

10.76 In addition to taking account the six factors in section 87(4) of the Act, we consider that these network access obligations:

- further the interests of citizens in relation to communications matters and further the interests of consumers in the CISBO markets by promoting competition, in accordance with our general duty under section 3(1) of the Act; and

- seek to achieve the objective of securing the availability throughout the UK of a wide range of electronic communication services, in accordance with our duty under section 3(2) of the Act.

10.77 In proposing these network access obligations, in accordance with our duty under section 3(4) of the Act, we also have regard to:

- 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.

10.78 We also consider that the proposed network access obligations accord with the six European Community requirements for regulation, in particular by:

- promoting competition in the provision of electronic communications networks and services, associated facilities and the supply of directories; and
- encouraging the provision of network access and service interoperability, namely securing efficient and sustainable competition, efficient investment and innovation, and the maximum benefit for customers of CPs.

10.79 Section 47 of the Act requires conditions to be objectively justifiable, non-discriminatory, proportionate and transparent. We consider that the proposed SMP conditions are:

- objectively justifiable, in that they facilitate and encourage access to BT's network and therefore promote competition to the benefit of consumers;
- not unduly discriminatory, as they are imposed only on BT and no other operator has been found to hold a position of SMP in this market;
- proportionate, since they are targeted at addressing the market power that we have found BT holds in the CISBO markets and does not require it to provide access if it is not technically feasible or reasonable;
- transparent, in that they are clear in their intention to ensure that BT provides access to its networks in order to facilitate effective competition.

10.80 For all the reasons set out above, we consider that the proposed specific network access conditions are appropriate to address the competition concerns identified in accordance with section 87(1) of the Act.

The BEREC Common Position

10.81 We have also taken utmost account of the BEREC Common Position[261] including BP1 to BP3a which appear to be particularly relevant in this context.

[261] BoR (12) 126, *BEREC common position on best practice in remedies imposed as a consequence of a position of significant market power in the relevant markets for wholesale leased lines*, 26

10.82 We consider that our proposals are consistent with the best practice set out in the BEREC Common Position.

Transitional measures for the Central London Area (CLA) and CI core markets

10.83 In line with Article 16(3) of the Framework Directive and section 84(4) of the Act, we are proposing to revoke SMP conditions where we consider that proposed relevant markets are now competitive. Specifically, we are proposing to revoke regulations that currently apply to wholesale CISBO services in the CLA. The proposed expansion of the CI core market would also remove regulations from Competitive Core Nodes which currently fall within the wholesale CISBO markets.

10.84 Article 16(3) of the Framework Directive states that where Ofcom revokes SMP conditions, it should provide an appropriate period of notice to parties affected by such a withdrawal. The ERG Remedies Position (paragraph 5.6.2) provides further guidance.

10.85 Our initial view is that a period of notice is not necessary in this case. Given our provisional finding that the markets that we propose to deregulate are effectively competitive, we consider that BT would have an incentive to continue to supply these services on commercial terms. Moreover, BT's wholesale contracts for the supply of these services provide additional protection for CPs, and for example specify a minimum contract period, a 12-month notice period for service withdrawal and a 3-month notice period for price increases.

10.86 We would however, welcome stakeholder comments accompanied by specific evidence concerning the need or otherwise for a notice period.

Classification of circuits that cross boundaries between the CISBO markets

10.87 In the March 2013 BCMR Statement, we set out guidance on the classification of circuits which cross the WECLA boundary. In light of our proposal to define revised geographic markets for CISBO, we now propose to update that guidance.

10.88 We propose that wholesale CISBO circuits that cross the CLA boundary, from either the LP or the RoUK markets, should be classified as follows:

- Wholesale end-to-end services (i.e. circuits between two end-user sites) – should be classified as inside the CLA only if both end-users sites are in the CLA and other circuits should be classified as outside the CLA (i.e. if one or more sites are outside the CLA); and

- Other circuits (i.e. circuits between an end-user site and a network node or between network nodes) – should be classified as being in the CLA if the end-user site is within the CLA or, in the case of backhaul circuits, if the remote end of the backhaul circuit is within the CLA.

November 2012, http://berec.europa.eu/files/document_register_store/2012/11/BoR_(12)_126_Draft_WLL_CP_2012.11.26.pdf.

10.89 We propose that wholesale CISBO circuits that cross the boundary between the LP and the RoUK market should be classified as follows:

- Wholesale end-to-end services (i.e. circuits between two end-user sites) – should be classified as inside the LP only if both end-users sites are in the LP and other circuits should be classified as outside the LP (i.e. if one or more sites are outside the LP): and

- Other circuits (i.e. circuits between an end-user site and a network node or between network nodes) – should be classified as being in the LP if the end-user site is within the LP or, in the case of backhaul circuits, if the remote end of the backhaul circuit is within the LP.

10.90 We consider that the approach outlined above is consistent with the competitive conditions found in the CLA, LP and RoUK markets. For example, we consider that CPs should be able to establish network nodes within the CLA and serve sites within the CLA from such nodes, hence our proposal that circuits between an end-user site within the CLA and a network node outside the CLA should be classified as inside the CLA.

Question 10.1: Do you agree with the specific active remedies that we propose for BT in the wholesale CISBO markets? If not, what alternative active remedies would you propose and why?

Section 11

Specific remedy for the TISBO market

Introduction

11.1 In this section we set out the specific remedy that we propose to impose on BT in the wholesale market for Traditional Interface Symmetric Broadband Origination (TISBO) in the UK excluding the Hull area at bandwidths up to and including 8Mbit/s (TISBO market). This remedy is in addition to the proposed general remedies for the TISBO market, as discussed in Section 8.

11.2 In Annex 16 we have provided a summary of the current wholesale remedies and a description of the wholesale leased lines products that BT currently offers. We also explain the relevance of the Undertakings to wholesale leased lines markets.

Summary of proposals

11.3 In summary, we are proposing to retain the Partial Private Circuits (PPC) Direction in the TISBO market. In light of BT's intention to withdraw very low bandwidth PPCs in the next few years, we propose to amend the Direction to permit BT to withdraw sub 2Mbit/s PPCs, subject to it giving existing customers a year's notice.

11.4 We consider the PPC Direction is necessary to address the competition problems summarised in Section 7, in particular: refusal to supply, price discrimination and non-price discrimination.

11.5 We consider that these remedies would achieve our statutory duties and would satisfy the relevant legal tests. In reaching these proposals, we have also taken account of our regulatory experience from the two previous market reviews, recent developments in these markets, views expressed by stakeholders in response to the April 2014 CFI and expected developments over the course of the review period of three years.

Assessment of appropriate remedies

Current remedies

11.6 The PPC Direction was first introduced in 2002. It currently requires BT to provide PPC terminating segments in each of the three TISBO wholesale markets in the UK (excluding the Hull area) defined in the 2013 Review.[262] In the low bandwidth TISBO market in the UK (excluding the Hull area), it also requires BT to provide Radio Base Station (RBS) backhaul traditional interface circuits at bandwidths up to and including 2Mbit/s to mobile operators.

11.7 The PPC Direction specifies detailed requirements for the provision and repair of PPCs and RBS backhaul including:

[262] These markets are the wholesale market for low bandwidth TISBO in the UK excluding the Hull area at bandwidths up to and including 8Mbit/s, the wholesale market for medium bandwidth TISBO in the UK excluding the Hull area and the WECLA at bandwidths above 8Mbit/s and up to and including 45Mbit/s, and the wholesale market for high bandwidth TISBO in the UK excluding the Hull area and the WECLA at bandwidths above 45Mbit/s and up to and including 155Mbit/s.

- migration arrangements (for migration of retail private circuits to PPCs);
- forecasting arrangements for capacity ordering; and
- Service Level Agreements (SLAs) including provision and repair performance targets and service level guarantee (SLG) payments.

Developments since the 2013 Review and stakeholder comments

Migration processes

11.8 During the 2013 Review, we encouraged BT to explore opportunities for TISBO to AISBO migration processes in conjunction with CPs. In response to a Statement of Requirement request to support TISBO to AISBO migration, BT offered[263] to conduct a "Proof of Concept" trial into the use of optical splitters, along with the procedures for migrating PPC/RBS services to Ethernet Access Direct (EAD). However, BT suspended the trial in April 2013 citing 'low trial engagement by CPs'.

11.9 The issue of migration processes from TISBO to AISBO was not raised by any respondents to the April 2014 Call for Inputs.

11.10 In light of these developments we have not made proposals in relation to TISBO to CISBO migration processes.

Need for the PPC Direction

11.11 BT has restated its view[264], as expressed in the 2013 Review, that the PPC Direction is obsolete. BT points out that the provisions within the PPC Direction are included in BT's reference offer to CPs, which is a legally binding contract on both parties. If the PPC Direction were removed, BT would still be bound by the contract and would require CPs agreement to make changes to the contract.

11.12 During the 2013 Review, BT proposed that the SLA and SLG provisions should be removed from the Direction. BT argued that it would not have an incentive to restrict the supply of PPCs or degrade their performance as the resultant migration to Ethernet services would be likely to lose it business, and that CPs were protected by contractual provisions which restricted BT's ability to change the SLA/SLG arrangements.

Withdrawal of very low bandwidth TI services

11.13 BT has announced that over the next few years it intends to withdraw certain very low bandwidth (VLB) retail leased lines and the corresponding wholesale inputs (sub 2Mbit/s PPCs). BT's current plans are to withdraw these VLB retail services in March 2020 and sub 2Mbit/s PPCs no earlier than 2020.

11.14 Alongside this consultation we have published a consultation setting out our proposals to: withdraw retail regulation for BT's retail VLB leased line services; and

[263] BT Openreach website: http://www.openreach.co.uk/orpg/home/updates/briefings/ethernetservicesbriefings/ethernetservicesbriefingsarticles/eth02213.do

[264] Email from BT Wholesale to Ofcom re PPC Direction, 25 November 2014.

our plans to mitigate the potential risk associated with service withdrawal to critical national infrastructure services that use very low bandwidth leased lines.[265]

Trunk market changes and replicability

11.15 In Section 5 and Annex 19 we explain our proposal to amend the definition of TI terminating segments to include segments currently defined as regional trunk segments. It is important that this change and any subsequent pricing revisions that BT may choose to make do not undermine CPs' ability to commercially replicate BT's retail leased lines using PPCs. We would expect BT to maintain cost allocation arrangements established in 2009 in support of our work on Replicability.[266] In particular, BT should continue to ensure that its cost allocation systems treat internal and external circuits in the same way, for example by allocating costs to PPCs and BT's downstream services on a circuit volume basis to ensure that differences in circuit routings do not translate into a commercial disadvantage for CPs.[267]

Aim and effect of the proposed regulation

11.16 Section 45(10)(a) of the Act authorises the giving of directions with respect to matters to which an SMP condition relates. The proposed PPC Direction is intended as a complementary remedy to the proposed network access obligation. The PPC Direction augments the network access obligation by requiring BT to provide PPC terminating segments and RBS Backhaul services and is designed to ensure that they are provided in a non-discriminatory manner and with a level of performance that meets CPs' requirements. The SLG provisions of the PPC Direction are designed to incentivise BT to ensure that performance meets the specified targets and also to compensate CPs when performance does not meet the targets.

11.17 In the absence of the PPC Direction we consider that BT would have an incentive and the ability to refuse access at the wholesale level or to offer it on terms that would not meet CPs' requirements. This would favour BT's own retail operations with the effect of hindering sustainable competition in the corresponding downstream markets, ultimately against end users' interests.

Proposed remedy

11.18 As discussed in Section 5, PPCs and RBS backhaul account for the vast majority of terminating segments provided in this market and we expect this to continue to be the case given the legacy nature of the market and the gradual transition to CISBO services. Consequently, we consider that PPCs and RBS Backhaul remain the relevant products for fostering competition in downstream TI markets.[268] We are therefore proposing to reapply the PPC Direction to the TISBO market.

11.19 We propose to retain the SLA/SLG provisions. If these provisions were removed, BT might have an incentive to change the SLA/SLG terms for PPCs in order to reduce compensation payments. We consider that there is a risk that it could use its market power to require CPs to accept changes to the contractual arrangements.

[265] http://stakeholders.ofcom.org.uk/consultations/very-low-bandwidth/
[266] http://stakeholders.ofcom.org.uk/consultations/low_bandwidth/?a=0
[267] These differences arise because circuit routings of CPs are sometimes less direct than BT circuit routing (this is because CPs need to route their circuits via their nearest point of handover with BT's network).
[268] See, in this respect, BP3a from the BEREC Common Position

11.20 There are still almost 250,000 end-users using low bandwidth TI circuits, so there is an ongoing need to protect these customers and CPs from poor service, particularly in relation to repairs. There were over 3,000 new 2Mbit/s connections in 2013/14 and some end-users of VLB leased lines may migrate to PPCs as those services are withdrawn over the next few years. We therefore consider it appropriate to retain the well-established provisioning requirements for the TISBO market.

11.21 As discussed above, BT is planning to withdraw sub 2Mbit/s PPCs over the next few years. As these are legacy services that are approaching the end of their life, we consider that it would be inappropriate for wholesale regulation to artificially extend the availability of these services. Consequently we are proposing an amendment to the PPC Direction to facilitate the withdrawal of sub 2Mbit/s PPCs. The effect of the amendment is to disapply the requirement for BT to supply sub 2Mbit/s PPCs, on condition that BT gives notice of withdrawal of not less than one year. The PPC Direction would continue to apply to PPCs at higher bandwidths. This would complement our proposal to withdraw regulation from the retail VLB TI market.

Legal tests

11.22 For the reasons set out below, we are satisfied that the proposed PPC Direction (as set out in Annex 7) meets the various tests specified in the Act.

11.23 Section 87(3) of the Act authorises the setting of an SMP services condition requiring the dominant provider to provide such network access as Ofcom may, from time to time, direct. Section 45(10)(a) of the Act authorises the giving of directions with respect to matters to which an SMP condition relates. These provisions 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.

11.24 In proposing the PPC Direction, we have also taken account of the factors set out in Section 87(4) of the Act. In particular, the economic viability of CPs building alternative access networks (they are unlikely to do so, given the costs involved and the transition from TI to CI technologies), and the feasibility of BT providing PPCs (demonstrated by their very widespread existing provision). We consider the proposed direction will continue to help secure effective competition in the long term.

11.25 We have also considered our duties under section 3 and the Community requirements set out in section 4 of the Act. In particular, our proposals are aimed at encouraging network access and thereby promoting and securing efficient and sustainable competition and the maximum benefit of customers of communications providers. It will continue to enable CPs to compete effectively with BT in downstream leased lines markets. We consider that these services will remain an important element of this market over the forward looking period of this review.

11.26 We therefore consider that the proposed PPC Direction is consistent with our duties in section 3 of the Act.

11.27 We consider that the proposed PPC Direction 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 operates ultimately to the benefits of consumers. PPCs are aimed at stimulating competition in the provision of leased lines services. Removing the condition

could result in BT withdrawing PPCs or otherwise changing them to the detriment of the existing level of downstream competition (limiting the extent to which regulatory intervention addresses BT's SMP);

- not unduly discriminatory, as the PPC Direction aims to address BT's market power in the market of the UK (excluding the Hull area), in which we provisionally consider that only BT has SMP; and

- proportionate, in that the requirement is necessary, but no greater than necessary, to promote efficient and sustainable competition for the maximum benefit of customers of communications providers, 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 PPCs to CPs.

Question 11.1: Do you agree with the PPC Direction that we propose for BT in the wholesale TISBO market? If not, what alternative would you propose and why?

Section 12

Remedies – interconnection and accommodation services

Introduction

12.1 In this section we set out our proposals for specific obligations for interconnection and accommodation services.

12.2 CPs require certain ancillary services from BT in order to use the wholesale products that BT is required to provide in the TISBO and CISBO markets. The ancillary services, which include interconnection and accommodation services, are needed in order for CPs to interconnect their networks with BT's. We therefore consider it necessary to regulate provision of interconnection and accommodation services in order to address BT's SMP in the relevant wholesale markets.

12.3 In Section 8 we set out our proposed general remedies for the TISBO and CISBO wholesale markets and explained that these remedies would also apply to the interconnection and accommodation services that BT provides in connection with wholesale services. Consequently BT would be required to meet reasonable requests for interconnection and accommodation services under the general network access obligation that we propose for each of these markets.

12.4 A Point of Connection (POC) or a Point of Handover (POH) is the point at which another CP's network interconnects with BT's network. A description of interconnection and accommodation products offered by BT can be found in Annex 16.

Interconnection obligations

Current remedies

12.5 In the low bandwidth TISBO market in the UK (excluding the Hull area) BT is currently subject to an obligation to provide network access including the following specific interconnection services:

- Customer Sited Handover (CSH): BT provides a POC at the site of the interconnecting CP. This requires BT to extend its network and provide a link/equipment.
- In Span Handover (ISH): Both BT and the interconnecting CP build out their respective networks to a passive handover point located between the premises. The handover point is adjacent to the BT exchange and therefore most of the build is the responsibility of the interconnecting CP.
- In Span Handover extension (ISH Extension): Similar to ISH, except the handover point is located further from BT's exchange but still within the serving area of that exchange.
- In Building Handover (IBH): A POC at co-location space rented by a CP in a BT exchange in support of disaggregated services.

12.6 In the AISBO and MISBO markets in the UK (excluding the Hull area) - as defined in the 2013 Review - BT is subject to an obligation to provide network access including the following specific interconnection services:

- Customer Sited Handover (CSH): There are two types of AISBO CSH – with aggregation and without aggregation. In the case of the former, BT currently supplies Bulk Transport Link (BTL) which aggregates multiple EBD services for delivery over a single interconnection link to the CP's site. BT extends its network to a POC at the CP's site. In the case of the latter, BT terminates individual circuits at the CP's site without aggregation. This method is commonly used for WES and EAD circuits.

- In Building Handover (IBH): BT provides a POC at co-location rented by a CP in a BT exchange. This connection is without aggregation.

12.7 These interconnection products are also subject to price controls with the exception of IBH and AISBO CSH without aggregation.

Stakeholders' comments and developments since the 2013 Review

12.8 The 2013 Review introduced the requirement for BT to provide IBH for TISBO, to facilitate interconnection of the disaggregated TI products TDM Access Bearer and TDM Backhaul Bearer at accommodation rented by CPs in BT local exchanges.

12.9 In the 2013 Review Statement we noted that CPs had requested that Openreach develop an ISH interconnection option for AISBO and also an aggregation capability known as 'High Density Handover' to make IBH and ISH interconnection more efficient than handing over each circuit individually. We urged product development to be brought to a conclusion as soon as reasonably possible.

12.10 The relevant requests[269] were in the Statement of Requirements process for over three years and the propositions evolved over time. In autumn 2014 Openreach closed the requests on the basis that there was no evidence of commercial demand on which it could make a case for the development of an aggregated interconnection option for AISBO services.

12.11 We note that in 2016 Openreach plans to introduce a second supplier of equipment for EAD services. This equipment is more compact and may therefore reduce pressure for space/power in exchanges. We also understand that BT has asked CPs about their interest in the development of aggregation solutions using functionality supported by the second supplier's equipment.

12.12 No responses to the April 2014 CFI specifically addressed the interconnection obligations, although Vodafone cited reduced reliance on interconnection to BT's network architecture as one of the potential benefits of passive remedies[270]. We consider passive remedies in Section 9.

Aim and effect of the proposed regulation

12.13 In the absence of regulation, BT would have an incentive not to supply some or all of these services or to charge excessive prices, particularly as it does not require

[269] Openreach online Statement of Requirements (SoR) Management Tool, SoRs 8166 and 8176.
[270] Vodafone response to the April 2014 CFI, p21.

interconnection services in order to provide its own downstream retail services. As CPs must purchase these services, this would have the same effect as refusal to supply, or excessive pricing for, the main wholesale products that BT supplies. We therefore consider it necessary to require BT to provide interconnection services and to apply a price control.

12.14 We have established specific requirements for different types of interconnection in order to facilitate different forms of competition. CSH facilitates new market entry by allowing CPs to interconnect without having to incur the significant costs of extending their networks to BT exchanges. ISH (including the ISH extension variant) is necessary to ensure CPs have the option of extending their networks to interconnect closer to BT exchanges. This provides an incentive for CPs to extend their infrastructure. IBH facilitates the use of disaggregated access services and facilitates competition by allowing CPs with a POP within a BT exchange to expand the range of services that they provide, potentially benefiting from economies of scale and scope by providing business connectivity services, in addition to LLU based broadband and telephony services.

Proposed remedies

12.15 We propose to require BT to provide specified interconnection services in the relevant wholesale markets. In the wholesale market for low bandwidth TISBO in the UK excluding the Hull area, at bandwidths up to and including 8Mbit/s, we propose to require BT to provide:

- In Span Handover (ISH);
- In Span Handover Extensions (ISH extension);
- Customer Sited Handover (CSH); and
- In Building Handover (IBH).

12.16 In the wholesale markets for Contemporary Interface Symmetric Broadband Origination (CISBO) in the London Periphery area; and for Contemporary Interface Symmetric Broadband Origination (CISBO) in the Rest of the UK (RoUK); we propose to require BT to provide:

- Customer Sited Handover (CSH); and
- In Building Handover (IBH).

12.17 As explained in Section 9, we propose a specific requirement to provide Dark Fibre Services in the CISBO markets. We explain that the obligations proposed in this section would therefore include the same obligations in relation to accommodation and interconnection that apply to other types of network access.

12.18 In view of the developments outlined above we are not proposing to introduce a specific requirement in relation to the High Density Handover development for aggregated CISBO interconnection. However, we are proposing that BT will continue

to be subject to an obligation to meet reasonable requests for new forms of network access including interconnection services.[271]

Accommodation services

Current remedies

12.19 BT is currently subject to an obligation to provide accommodation services in the following wholesale markets:

- in the low bandwidth TISBO market[272] in the UK (excluding the Hull area);
- in the low bandwidth AISBO and MISBO markets in the UK (excluding the Hull area and the WECLA); and
- in the low bandwidth AISBO market in the WECLA.

12.20 For each of these markets BT is also subject to an obligation to allocate accommodation space on the basis of equivalence of inputs (EOI) and is subject to price controls for accommodation services.

12.21 BT provides two types of regulated accommodation services: Co-mingling and Access Locate (for a detailed description of these products see Annex 16). Co-mingling is exclusively provided in support of Local Loop Unbundling, whilst Access Locate provides accommodation for the majority of other access services supplied by Openreach, including Ethernet leased lines.

12.22 BT also provides a 'tie-cable' product in support of accommodation services called Cablelink. Cablelink has both internal and external variants. The internal variant allows a CP to connect two remote licensed areas of the BT exchange building (i.e. two separate areas in which the CP has installed its equipment). The external variant allows a CP's external fibre cable located immediately outside a BT exchange to be connected to a CP's licensed area.

12.23 Cablelink is not a handover product as such as it is a passive product that does not interconnect BT equipment to the CP's equipment for the purposes of carrying TISBO or AISBO traffic. However, we consider that it is an essential element of the accommodation services that BT provides given that it allows a CP to connect its POP within the BT exchange with its fibre outside the exchange.

Developments since the 2013 Review and stakeholders' comments

12.24 In its response to the April 2014 CFI, Virgin[273] stated the provision of Cablelink has been poor and compromised the supply of wholesale services to other CPs. It said provisioning delays are exacerbated by a lack of visibility on order progress and the lack of a fit-for-purpose escalation process.

[271] See paragraph 8.37 of Section 8.
[272] These obligations also currently apply to medium and high bandwidth TISBO in the UK (excluding the Hull area and the WECLA).
[273] Virgin response to Ofcom BCMR Call for Inputs consultation, p2-4.

12.25 Virgin[274] and EE, Three & MBNL[275] [✂

✂].

12.26 In June 2013 Virgin submitted a Statement of Requirements request[276] for a new variant of external Cablelink to connect MNO cell sites on the rooftops or grounds of BT exchanges to external OCP networks. In industry discussions, Openreach have stated they were assessing this as a commercial product rather than one driven by regulation. In April 2015 Openreach concluded that it could not see an economic case to progress the requirement, due to insufficient evidence of volume demand at a price needed to provide a positive return on the potential costs of an Openreach product development. However, Openreach added that it could see a potential case for a connectivity product from CPs' equipment within the MUA area of the BT exchange and MNO sites on the rooftops/grounds of exchanges. This requirement is being progressed by Openreach and they have announced indicative development timescales to industry for delivery by close of Q4 2015/16.

12.27 In October 2014 BT introduced a five hour repair as the standard service on the Ethernet Cablelink product. This replaced the previous 48 hour repair service and was introduced in response to SoR 8418.[277]

Aim and effect of the proposed regulation

12.28 The availability of accommodation in BT exchanges is an important enabler of competition in leased lines markets. It allows CPs to make use of disaggregated products such as EAD Local Access and facilitates competition in downstream markets.

12.29 Space and power in BT's exchanges is limited, and in the absence of regulation BT would have the incentive and ability to discriminate in favour of its own needs in allocating such space and power.

12.30 In 2008, in a variation to the BT Undertakings[278] BT committed to assign space and power on a 'First-Come-First-Served' (FCFS) basis but did not require it to consume the same accommodation products that are used by CPs. The rationale for this approach was based on the scale of deployment of equipment by BT. BT's requirements are likely to be different to those of other CPs so that BT's downstream divisions are likely to use different accommodation products from those used by other CPs, even if those divisions were required to obtain these products from Openreach.

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[274] Virgin confidential response to Ofcom BCMR Call for Inputs consultation, p3-4.
[275] Combined response of EE, Three and MBNL to Ofcom BCMR Call for Inputs consultation, Confidential version, p6-7.
[276] Openreach online SoR Management Tool, SoR 8401.
[277] BT Openreach website: https://www.openreach.co.uk/orpg/home/updates/briefings/ethernetservicesbriefings/ethernetservicesbriefingsarticles/eth03514.do
[278] Variations to BT's Undertakings under the Enterprise Act 2002 in respect of BT's NGN, Space and Power and OSS separation http://stakeholders.ofcom.org.uk/binaries/consultations/variations_bt/statement/statement071008.pdf

12.31 At the time of the variation, we took the view that it is appropriate that provisioning activities, such as the provision of ironwork and power in BT owned buildings, should be carried out by a single provider as management of an exchange where multiple CPs are all carrying out their own works would be complex and inefficient.

12.32 We consider that these conclusions, and the established approach to allocating accommodation services, remain valid. We think that allocation of accommodation on an EOI basis, in conjunction with a set of charge-controlled accommodation products that meet CPs needs, addresses the competition issue in a proportionate manner.

12.33 Given the importance of accommodation to CPs it is essential that space and power continue to be allocated on a FCFS basis. For this reason, we propose to set appropriate SMP conditions to require that allocation of space and power is undertaken by BT on an EOI basis.

Proposed remedies

12.34 We propose an obligation for BT to provide accommodation services in the relevant wholesale markets:

- wholesale market for low bandwidth Traditional Interface Symmetric Broadband Origination (TISBO) in the UK excluding the Hull area, at bandwidths up to and including 8Mbit/s;
- wholesale market for Contemporary Interface Symmetric Broadband Origination (CISBO) in the London Periphery area; and
- wholesale market for Contemporary Interface Symmetric Broadband Origination (CISBO) in the Rest of the UK (RoUK).

12.35 As we have discussed in Section 9, we consider that CPs will require accommodation services in order to make use of the dark fibre remedy that we propose for the wholesale CISBO markets listed above. We therefore propose that the obligation to provide accommodation services should also apply to dark fibre.

12.36 For each of the markets above, we propose BT should be subject to an obligation to allocate accommodation space on the basis of EOI and to price controls for accommodation services including Cablelink.

12.37 We address the concerns of Virgin and other CPs about the provisioning performance of BT in relation to Ethernet products (including Cablelink) in Section 13. Poor provisioning performance for interconnection and accommodation products such as Cablelink is a particular concern, given that these products are not consumed by BT's downstream businesses. As explained in Section 13, we are therefore proposing that Cablelink should be included within the scope of new minimum performance standards for provisioning. We also propose that BT should be required to produce Key Performance Indicators (KPIs) for Cablelink provision. We consider that specific KPIs for Cablelink are necessary because it has distinct provisioning arrangements and the volumes of Cablelink are relatively low. Without specific KPIs, performance problems in the provision of Cablelink could be masked by the large volumes of other products. Our proposed approach would provide transparency to monitor Openreach's performance in the provisioning of Cablelink.

12.38 With regards to the external variant of Cablelink, we note BT's recent update on its planned approach to the development of the variant proposed in SoR 8401. Unlike

other existing forms of Cablelink, the requested type is not an ancillary service since it is not associated with the supply of wholesale leased lines services. Our initial view is that BT's role in this matter is primarily that of property owner and that this therefore is a contractual matter concerning access to roof space rented by MNOs on commercial terms. Consequently, we are not proposing specific remedies in relation to this issue.

Legal tests

12.39 Section 87(3) of the Act authorises the setting of SMP conditions requiring the dominant provider to provide such 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.

12.40 Section 87(3) includes reference to conditions requiring relevant facilities to be made available. Network access is also defined in sections 151(3) and (4) of the Act so as to include 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.

12.41 We are satisfied that the proposed obligations (set out in Annex 6) requiring BT to provide interconnection and accommodation services in the relevant wholesale markets meet the various tests set out in the Act.

12.42 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 obligations are aimed at promoting competition by ensuring that CPs are supplied with interconnection and accommodation services that they require in order to use the wholesale services BT supplies effectively, including those services provided pursuant to the remedies proposed in this review.

12.43 Second, sections 47 and 49 require conditions and directions respectively to be objectively justifiable, non-discriminatory, proportionate and transparent. The proposed conditions and directions are:

- objectively justifiable, in that they facilitate and encourage access to BT's network and therefore promote competition to the benefit of consumers;
- not unduly discriminatory, as they are proposed only for BT and no other operator has been found to hold a position of SMP in these markets;
- proportionate, in that they prevent BT from exploiting its SMP by withdrawing these interconnection and accommodation services; and
- transparent, in that the conditions are clear in their intention to ensure that BT provides access to its networks in order to facilitate effective competition.

The BEREC Common Position

12.44 We have also taken utmost account of the BEREC Common Position[279] including BP7, BP7a and BP20 which appear to us to be particularly relevant in this context.

12.45 We consider that our proposals are consistent with the best practice set out in the BEREC Common Position.

Charge controls

12.46 As we discuss in more detail in Section 8, we propose to impose a charge control in each of the relevant wholesale markets to address BT's ability and incentive to charge excessive prices. We consider that the charge control should encompass the specified interconnection and accommodation services.

12.47 We will set out our proposals for charge controls in the forthcoming June 2015 LLCC Consultation.

Question 12.1: Do you agree with the interconnection and accommodation remedies that we propose for BT in the wholesale TISBO and CISBO markets? If not, what alternative remedies would you propose and why?

[279] BoR (12) 126, BEREC common position on best practice in remedies imposed as a consequence of a position of significant market power in the relevant markets for wholesale leased lines, 26 November 2012, http://berec.europa.eu/files/document_register_store/2012/11/BoR_(12)_126_Draft_WLL_CP_2012.11.26.pdf

Section 13

Remedies – Quality of Service

Introduction

13.1 In this section we set out the quality of service SMP remedies we propose to impose on BT in the following wholesale leased lines markets:

- the wholesale market for Contemporary Interface Symmetric Broadband Origination (CISBO) in the London Periphery area; and
- the wholesale market for Contemporary Interface Symmetric Broadband Origination (CISBO) in the UK excluding the Central London Area, the London Periphery area and the Hull area.

13.2 We refer to both of these markets together as "the wholesale CISBO markets" unless specified otherwise.

13.3 The quality of service remedies we propose are based on the nature of the competition problems we have identified in our market analysis, in particular, our SMP assessment, in which we provisionally find that BT has SMP in (amongst other markets) the wholesale CISBO markets. We set out these competition problems in Section 7.

13.4 Of particular relevance to our consideration of quality of service in this section is our concern that, in the absence of appropriate ex ante regulation, there is a risk that poor quality of service offered by BT in the provision and repair of wholesale services will impact detrimentally on all downstream providers of leased lines, including BT's retail businesses, and ultimately to the detriment of end-users.

13.5 Our assessment of the appropriate *ex ante* regulation to remedy our above concern is based on our review, detailed in this section and Annex 17, of the quality of service provided by Openreach in the supply of network access in the current wholesale Alternative Interface Symmetric Broadband Origination (AISBO) markets, in particular, the provision of wholesale Ethernet services to downstream CPs including BT businesses. Our review has highlighted that since the 2013 Review[280], Openreach's service performance, particularly in provisioning new Ethernet services, has deteriorated materially. We therefore consider that additional regulatory measures are required in this review to address Openreach's incentives to deliver an adequate standard of service.

13.6 We consider that the remedies we propose in this section would achieve our statutory duties and would satisfy the relevant legal tests. In reaching these proposals, we have also taken account of our regulatory experience from the two previous market reviews, recent developments in these markets based, in particular, on extensive information provided by Openreach and its customers on quality of

[280] Ofcom, *Business Connectivity Market Review, Review of retail leased lines, wholesale symmetric broadband origination and wholesale trunk segments, Statement*, 28 March 2013, http://stakeholders.ofcom.org.uk/consultations/business-connectivity-mr/final-statement/

service, views expressed by stakeholders in response to the CFI[281] and by end-users in response to new research we have commissioned (the BDRC Quality of Service Report[282]), and also expected developments over the course of the review period of three years.

Summary of proposals

13.7 To complement our proposals to re-impose requirements on BT to provide certain wholesale leased lines on an equivalent of inputs (EOI) basis and to publish a Reference Offer which includes service level agreements (SLAs) and service level guarantees (SLGs)[283], the package of quality of service *ex ante* remedies that we propose to impose on BT in the wholesale CISBO markets can be summarised as follows:

a) A new quality of service SMP condition which requires BT to comply with any quality of service requirement we may direct in relation to network access provided by BT pursuant to our proposed general and specific network access obligations;

b) Pursuant to the above quality of service SMP condition, a direction which requires BT to comply with minimum quality of service standards over the 2016 to 2019 period in relation to:

i) the orders completed on or before the initial contractual delivery date (CDD) provided to its customers as shown in Table 13.1;

Table 13.1: Proposed minimum standards for orders achieving the initial CDD

		New minimum standard		
	Current performance (2014)	**Performance over Year 1 (2016/17)**	**Performance over Year 2 (2017/18)**	**Performance over Year 3 (2018/19)**
% of orders completed on or before initial CDD	circa 45%	80%	85%	90%

ii) the initial CDDs given by BT to its customers to comply with the proposed time to provide minimum standards in Table 13.2 below (e.g. in Year 1 the initial CDDs which Openreach provides to its customers must, on average for all orders, be no more than 46 working days from order validation etc);

iii) the time taken from order validation to order completion as shown in Table 13.2; and

[281] Ofcom, *Business Connectivity Market Review, Timetable and initial call for inputs, Consultation*, 1 April 2015, http://stakeholders.ofcom.org.uk/binaries/consultations/business-connectivity-market-review/summary/Business-Connectivity-Market-Review.pdf. Responses to this consultation are published at http://stakeholders.ofcom.org.uk/consultations/business-connectivity-market-review/?showResponses=true.

[282] BDRC Continental, *Ofcom Quality of Service: Ethernet Leased Lines 2014*, http://stakeholders.ofcom.org.uk/binaries/consultations/bcmr-2015/annexes/QoS_report_27th_April.pdf

[283] As set out in Section 8 concerning our proposals for general remedies.

Table 13.2: Proposed time to provide minimum standards for orders

			New minimum standard (Working days excludes customer caused delays)		
	2011 performance	**Current performance (2014)**	**Performance over Year 1 (2016/17)**	**Performance over Year 2 (2017/18)**	**Performance over Year 3 (2018/19)**
Mean time to provide across orders	40 working days	46 working days	No more than 46 working days	No more than 40 working days	As Year 2
Lower percentile limit	40% of provisions delivered in 29 working days	40% of provisions delivered in 30 working days	At least 40% of provisions delivered in 30 working days or less	At least 40% of provisions delivered in 29 working days or less	As Year 2
Upper percentile limit	3% of provisions delivered in more than 118 working days	3% of provisions delivered in more than 159 working days	No more than 3% of provisions delivered in more than 159 working days	No more than 3% of provisions delivered in more than 118 working days	As Year 2

iv) the faults repaired within the SLA of 5 hours as shown in Table 13.3.

Table 13.3 Proposed minimum standards for fault repair

			New minimum standard		
	2011 performance	**Current performance (2014)**	**Performance over Year 1 (2016/17)**	**Performance over Year 2 (2017/18)**	**Performance over Year 3 (2018/19)**
% faults fixed within 5 hours	93.1%	94.4% (Jan'14 to Jul'14)	At least 94% of faults fixed within 5 hours	As Year 1	As Year 1

c) Also pursuant to the quality of service SMP condition, a direction which requires BT to provide specified quality of service Key Performance Indicators (KPIs); and

d) Pursuant to the proposed general network access SMP condition, a direction concerning the SLGs BT must provide for in its terms and conditions for the provision of Ethernet services.

13.8 Aside from these *ex ante* remedies, we also make proposals concerning the conduct of, and principles and criteria to be applied to, contractual negotiations between Openreach and its customers concerning SLAs and SLGs for the provision of Ethernet services. These proposals would see the OTA2 taking a central role in facilitating negotiations.

Changes relative to the 2013 Review

13.9 Our above proposals, in particular, a new quality of service SMP condition providing us with direction making powers and to use these powers to, amongst other things, direct BT to comply with minimum quality of service standards, represent a change in

regulatory intervention as regards quality of service relative to the 2013 Review. A comparison between the quality of service remedies we imposed in the 2013 Review and those we are now proposing is set out in Table 13.4 below.

Table 13.4: Comparison between the 2013 Review quality of service remedies and our proposals in this review

Remedies	2013 Review	Proposals
EOI SMP condition	Yes	Yes
Reference Offer (including SLAs and SLGs) SMP condition	Yes	Yes
SLG direction	Yes	Yes
Transparency as to quality of service SMP condition	Yes	No[284]
Quality of service SMP condition	No	Yes
Minimum standards direction	No	Yes
KPI direction	No	Yes

13.10 We have included in this comparison of quality of service remedies, the obligation to provide wholesale inputs on an EOI basis. This obligation, for which our proposals to re-impose EOI are detailed in Section 8, addresses the competition concern of a vertically integrated provider with SMP engaging in discriminatory conduct to favour its own downstream divisions over other CPs and distort competition at the retail level. Such conduct may include price and/or non-price discrimination. Such forms of non-price discrimination encompass quality of service such as the ability and incentive of a dominant provider to supply products with different levels of quality - e.g. different SLAs and SLGs, providing fault repair and/or the installation of products on different timescales, using different Operational Support Systems (OSS) for order handling and/or fault reporting, prioritising the needs of its downstream divisions in developing improvements and enhancements, and taking longer to address, or avoiding addressing, the requirements of its competitors.

13.11 An SMP EOI obligation is therefore an important regulatory remedy in relation to the quality of service provided by Openreach. Whilst it does not require specified performance levels, it ensures ex ante that the quality of service Openreach provides is the same for all its customers.

13.12 However, in light of the provisional findings of our review of Openreach's quality of service performance (as set out below in this section and Annex 17) in the wholesale AISBO markets and, going forward, the wholesale CISBO markets we have provisionally defined, we consider that further ex ante remedies are both appropriate and proportionate to address our concerns over the three year forward looking period

[284] We propose not to re-impose a SMP condition requiring transparency of quality of service, in light of our proposals to impose a new quality of service SMP condition which, among other things, would provide for Ofcom to direct BT to publish quality of service information.

of this market review. Moreover, they are targeted at cases where we consider, based on the evidence we have gathered, specific action is required: ensuring delivery date certainty and the time taken by Openreach to install Ethernet services meet appropriate minimum performance levels whilst ensuring that performance levels in relation to repair are maintained.

13.13 We note too, that the new measures we are proposing in this review follow on from similar interventions to require Openreach to comply with minimum quality of service standards which we decided were appropriate and proportionate in relation to the findings in our review of fixed access markets last year.[285] While the nature of the markets and the quality of service problems are not the same, we nevertheless consider that the underlying concerns regarding Openreach's incentives to maintain quality of service performance in these critical regulated markets are similar.

13.14 Retail CPs (including BT's own retail businesses) rely to a signficant degree on the regulated access which the operationally separate Openreach division[286] provides to BT's network, and on the quality of service with which Openreach delivers that access, to provide a wide range of communications services to UK consumers and businesses.

13.15 In common with our findings in the last fixed access market review, our assessment of Openreach's performance in the quality of service it provides to its customers, has caused us to consider further regulatory intervention to ensure minimum standards of performance are met. Absent further regulatory intervention, we are concerned that Openreach does not have sufficient incentives, in light of the SMP we provisionally find that it holds in the wholesale CISBO markets and notwithstanding its EOI obligations and extant SLA/SLG regime, to ensure that the quality of service it provides in the supply of Ethernet services in the wholesale CISBO markets meets the needs of its customers (that is CPs including BT's downstream divisions) and end-users over the forward looking period of this review.

Enforcement of our proposed remedies

13.16 Ofcom's approach to the enforcement of, amongst other things, SMP services conditions set under section 45 of the Communications Act 2003 (the Act) is set out in our published guidelines for the handling of competition complaints and complaints concerning regulatory rules.[287] The setting of penalties under the the Act, (such as a fixed penalty which may not exceed 10% of the turnover of the person's relevant

[285] Ofcom, *Fixed access market reviews: wholesale local access, wholesale fixed analogue exchange lines, ISDN2 and ISDN30: Statement on the markets, market power determinations and remedies, Statement*, 26 June 2014, http://stakeholders.ofcom.org.uk/telecoms/ga-scheme/specific-conditions-entitlement/market-power/fixed-access-market-reviews-2014/statement/.

[286] Openreach was created in 2005 as a result of the Undertakings given by BT to Ofcom in lieu of a reference to the Competition Comission pursuant to the Enterprise Act 2002. A consolidated version of these Undertakings as at 19 June 2014 is published at http://stakeholders.ofcom.org.uk/binaries/telecoms/policy/bt/Consolidated_Undertakings24.pdf.

[287] Ofcom, *Enforcement Guidelines, Ofcom's guidelines for the handling of competition complaints and complaints concerning regulatory rules, Guidelines*, 25 July 2012, http://stakeholders.ofcom.org.uk/binaries/consultations/draft-enforcement-guidelines/annexes/Enforcement_guidelines.pdf.

business for the relevant period), is set out in more detail in Ofcom's Penalty Guidelines.[288]

Structure of this section

13.17 This section is structured as follows:

- A summary of stakeholder responses to our April 2014 CFI and the BDRC Quality of Service Report.
- Openreach's Ethernet provisioning process, how it has been working in practice and process developments currently underway.
- Our provisional conclusions on Openreach's performance.
- The impact of poor performance on Openreach's customers.
- Openreach's incentives to deliver acceptable Ethernet provisioning quality of service.
- Proposed minimum standards for Ethernet provisioning and repair quality of service.
- Impact on Openreach's resources of our quality of service proposals.
- Implementation of our quality of service proposals.

Summary of stakeholder responses to our Call for Inputs (April 2014 CFI) and the BDRC Quality of Service Report

CFI responses

13.18 We have been aware of growing concerns about the provisioning of new Ethernet lines, in terms of the speed and unpredictability of delivery and have been monitoring the situation for some time. We reflected this in our April 2014 CFI for this review of business connectivity markets. We summarised our understanding of the context and concerns in relation to quality of service at that time and invited stakeholders to tell us about their experience of Openreach's provision and repair of wholesale leased lines.[289]

13.19 Here we provide a brief summary of some of the main comments made by stakeholders in response to the April 2014 CFI. A more detailed summary of each respondent's views is provided in Annex 17.[290]

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[288] Ofcom, *Penalty guidelines, s.392 Communications Act 2003*, 13 June 2011, http://www.ofcom.org.uk/files/2010/06/penguid.pdf.

[289] Paragraph 1.18 to 1.24 including Question 3, Ofcom, *Business Connectivity Market Review Timetable and initial call for inputs, Consultation*, 1 April 2014, http://stakeholders.ofcom.org.uk/binaries/consultations/business-connectivity-market-review/summary/Business-Connectivity-Market-Review.pdf

[290] Non-confidential responses from stakeholders to our CFI are published at http://stakeholders.ofcom.org.uk/consultations/business-connectivity-market-review/?showResponses=true

13.20 Many stakeholders expressed concerns relating to Openreach's recent performance in provisioning Ethernet services. Openreach itself acknowledged that its recent provision performance had not been at an acceptable standard. However, it considered that it understood the root causes of the problems and said that it was implementing measures to ensure a sustainable recovery, including recruitment, improvements to contractor performance, and process re-engineering.

13.21 The core concern of most respondents was that contractual delivery dates (CDDs) have been subject to a great deal of uncertainty due to the application of "deemed consent" by Openreach. Deemed consent is a contractual provision allowing Openreach to deem the consent of its customers to a change of the CDD in a range of circumstances as provided for in its contract and without incurring SLG payments. A related and important, but typically secondary, concern was that overall lead times have also increased. The general view expressed by most CPs was that these are ongoing problems that have endured over an extended period of time.

13.22 BT stated that delivery against a firm commitment, within a reasonable and predictable timescale, was a significant issue for customers. It acknowledged that businesses plan on the basis of original timescales and do not want these to change at short notice. It noted that customers are also dissatisfied with the frequency of quality updates throughout the provision process. All of these concerns were evidenced by responses from other CPs such as Virgin, who noted that delays caused by Openreach have been exacerbated by a lack of visibility over order progress. BT Wholesale, Colt, Verizon, Vodafone and the UKCTA noted that CPs had incurred increased internal resource costs in terms of managing both their customers (e.g. to provide updates about revised delivery dates) and Openreach (e.g. to obtain updates about order progress and delivery dates, or to escalate issues).

13.23 Provisioning problems appear to have been most significant for off-net orders.[291] For instance, Colt noted that Openreach's provisioning is generally satisfactory until an order involves civil works and procedures, at which point it has the potential to become a "very difficult experience".

13.24 BT stated that, as a whole, it had a strong interest in ensuring that service was good and that, like other CPs using Openreach products to provide business connectivity services, BT's downstream divisions also suffered when Openreach's service is poor. While acknowledging that improvements were needed, BT argued that these improvements would be best achieved via industry negotiation rather than regulation. It suggested that CPs were best positioned to judge what is feasible and desirable with regard to Openreach's Ethernet provisioning. BT added that Openreach already had sufficiently strong incentives to deliver good service, including competitive pressure from other operators and a rigorous SLA/SLG regime.

13.25 However, CPs such as Colt expressed a preference for regulatory intervention to address Openreach's quality of service problems. KCOM agreed, noting that CPs had been working with the OTA2[292] and Openreach for some time without any sustainable improvement being achieved. TalkTalk and Sky suggested that Ofcom

[291] Referring to those orders that require network build, i.e. where Openreach do not have existing network at a customer's premises.

[292] The Office of the Telecommunications Adjudicator - an independent organisation tasked by Ofcom to oversee co-operation between communications providers and enable a competitive environment in the telecommunications sector. See http://www.offta.org.uk/.

intervene in a manner similar to our quality of service interventions in the last review of fixed access markets, in which we imposed minimum standards on Openreach's quality of service for copper-based products.

13.26 Several CPs provided an assessment of whether Openreach had sufficient incentives to rectify its quality of service problems. For instance, Sky considered that Openreach's fundamental position, as an SMP operator facing limited competition for wholesale business connectivity services, meant that it had little incentive to improve its quality of service. It also noted that as some of Openreach's products are charge controlled, that there is potentially an incentive for Openreach to increase profits by way of sacrificing service quality to reduce costs.

13.27 There was a particular focus on whether or not the SLA/SLG regime provided Openreach with appropriately strong incentives to provide high quality of service. Verizon described deemed consent as a "get out of jail free card". This is because the SLA effectively refers to the final CDD, which Openreach can change and, in doing so, manipulate its liability to make SLG payments. Vodafone were also concerned about Openreach's use of deemed consent, and had carried out research which it claimed indicated that it was often improperly applied in as many as half of all cases.

13.28 Some CPs raised concerns relating to Project Services, which is a premium project coordination and management service offered by Openreach. Virgin noted that it had incurred additional costs by purchasing Project Services to mitigate poor quality of service and the associated lack of visibility of order progress. TalkTalk was of the view that Openreach had been successful in driving demand for Project Services through poor provisioning performance for standard orders, and thought that Project Services should be included within the scope of a charge control. KCOM also suggested that we investigate Project Services, in light of the Equality of Access Board's Annual Report 2013[293] which highlighted a disparity in Openreach's performance in favour of BT's downstream divisions relative to other CPs.

13.29 Although most respondents to the April 2014 CFI focused on Openreach's provision performance, there were also some comments about faults and repair performance. Virgin claimed that it has recently experienced a high fault rate, for which Openreach was responsible for the vast majority and also set out concerns about Openreach's performance in respect of providing Cablelink.[294] KCOM also noted that repair performance, while generally good and stable, had been subject to performance dips at times.

BDRC Quality of Service Report

13.30 We engaged BDRC Continental to conduct research into the value businesses and public sector organisations place on those elements of service performance which are directly attributable to Openreach's service quality.

[293] Equality of Access Board, 2013 Annual Report, http://www.btplc.com/Thegroup/Ourcompany/Theboard/Boardcommittees/EqualityofAccessBoard/Publications/EAB_Annual_Report_2013.pdf

[294] Cablelink is an Openreach product for CPs using space within a BT operational building. It facilitates a connection between that space and the CP's own network (external variant) or between non-adjacent spaces within the same BT operational building (internal variants).

13.31 The BDRC Quality of Service Report is published alongside this consultation document. It is accessible at: http://stakeholders.ofcom.org.uk/binaries/consultations/bcmr-2015/annexes/QoS_report_27th_April.pdf and we have provided a summary of the survey findings in A17.177 et seq at Annex 17.

13.32 The findings in the BDRC Quality of Service Report are consistent with the views set out by CPs and other stakeholders in relation to leased line provisioning. The evidence we have gathered demonstrates that customers of leased lines value the following, in order of importance:

- Certainty of delivery date;
- Prompt delivery (short lead times); and
- Clear and prompt communication of changes to delivery date when necessary.

Openreach's Ethernet provisioning process, how it has been working in practice and process developments currently underway

13.33 In this sub-section, we:

- provide a summary of the current Ethernet provisioning process;
- set out our assessment on how it has been working in practice;
- consider root causes of performance deterioration; and
- summarise our understanding of possible future changes to Ethernet provisioning processes based on proposed changes currently being discussed between Openreach and its customers.

Summary of Openreach's current Ethernet provisioning process

13.34 Understanding Openreach's Ethernet provisioning process is important as this identifies and establishes the activities and timescales required to fulfil specific parts of the process.

13.35 Ethernet provisions are relatively bespoke. Whilst some types of orders may be relatively easy to fulfil as there is pre-existing infrastructure in place, others can be more complex and require a certain amount of infrastructure new build.

13.36 Set out in Table 13.5 below are the categories of orders as defined by Openreach currently and the percentage of orders which fall into these categories.[295] The mix of orders between these four categories has remained fairly stable since 2011.[296]

[295] Approximate percentage of orders by category in 2014 (calendar year) the balance to 100% of orders are not categorised. See Table A17.5 in Annex 17.
[296] See our analysis of the composition of orders by category in Annex 17 paragraph A17.169.

Table 13.5: Ethernet provision categories

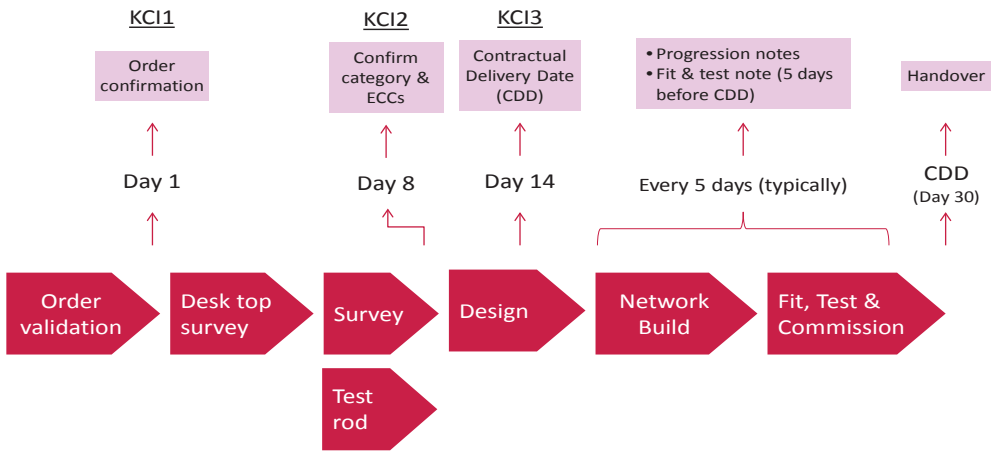
Category	Order category definitions	Approximate percentage of orders (circa 2014)
1	Fibre connection available between customer's premises. Possible installation and connection of fibre and equipment within the customer's premises and service testing and commissioning required.	40%
2	Fibre connection is available between Openreach network distribution nodes. In addition to possible category 1 activities installation of duct and fibre (cable or tubing with blown fibre) is required from Openreach network distribution node(s) to the customer's premises.	50%
3	In addition to possible category 1 and 2 activities a new spine fibre connection is required in part or whole between Openreach distribution nodes and serving exchange.	2%
4	In addition to possible category 1, 2 or 3 activities a new core fibre cable is required between exchanges.	2%

Source: Ofcom based on Openreach presentation "Ethernet Education Openreach/Ofcom 16th June 2014" and Ofcom analysis of Openreach section 135 responses dated 15 January 2015.

13.37 Figure 13.1 below outlines the current provisioning processes in terms of the high level steps, and the communication points (referred to as KCIs – Keep Customer Informed) where Openreach undertakes to provide updates to its customers about the progression of their order.

13.38 After initial order validation, the order progresses to the planning stage where initial survey activities are carried out. This results in the classification of the order under one of the above provision categories and identifies whether any excess construction charges (ECCs) are required. The order then progresses to the design stage to determine how the order will be fulfilled. A CDD is provided by Openreach to its customer during the design stage. The design is then passed to Openreach's field force and/or contractors to execute any build and finally the electronic equipment is installed, tested and commissioned.

Figure 13.1: Current Ethernet provisioning process



Source: Ofcom based on Openreach presentation "Ethernet Education Openreach/Ofcom 16th June 2014"

13.39 As shown in Figure 13.1 above, the provisioning process is specified as a 30 day process from order validation to handover to the customer.

How the process has been working in practice

13.40 We have undertaken our own review of Openreach's performance. Here we consider Openreach's provisioning performance with regard to its provisioning process described above. Further details of our analysis can be found in Annex 17 which we refer to throughout.

Lead times

13.41 Although Openreach's notional provisioning time is 30 working days, in practice, the actual lead times it delivers are higher across all provision categories.[297] However, by removing delays in the process attributed by Openreach to the customer, the mean time taken to provide the orders classified as Category 1 (i.e. where a fibre connection is available) is about 30 working days. The mean time to provide for all other categories is higher.[298] This is shown in Table 13.6 below.

[297] See Figure A17.8 in Annex 17.
[298] See Figure A17.10 in Annex 17. Aside from Category 1 orders, all other order categories exceed 30 working days even where delays are removed which Openreach attributes to both the customer and to third-parties. See Figure A17.11 in Annex 17.

Table 13.6: Mean time to provide excluding customer caused delay

	Excluding customer caused delay				
Provision category	1	2	3	4	All
2011	29	42	64	43	40
2012	26	46	78	43	39
2013	29	49	105	47	41
2014[299]	29	58	133	48	46

Source: Ofcom analysis of Openreach section 135 response dated 18 March 2015.

13.42 Even if we assess the average time between order validation and the initial CDD issued by Openreach to its customers (i.e. the date Openreach initially said it would deliver the order, not the date it actually delivered the order) we find that whereas Category 1 and 2 orders, excluding delays which Openreach attributes to its customers, have been stable at 20 and 30 working days respectively, Category 3 orders did not, on average, meet the 30 day lead time. In fact, according to our analysis, they deteriorated from around 50 days in late 2012 to over 80 days in the first half of 2014.[300]

13.43 Therefore the 30 day process is not often achieved in practice. Notably, the time taken to complete the "Design" and "Network Build" phases of an installation classified under Categories 2, 3 and 4 are significant and will vary considerably based on the particular circumstances surrounding an order. Some provision orders also attract ECCs due to the physical construction required. This can introduce delay, as Openreach first has to assess whether the customer is liable for ECCs, quote for ECCs and then wait for the customer's approval before proceeding. However, the introduction of flat-rate ECCs on 1 June 2014 for EAD orders, where customer approval is not required, appears to have significantly reduced this issue as a cause of significant delay in the provisioning process. (This is discussed further in Section 10 paragraph 10.36 et seq.) However, despite this, we note that in 2014 the mean time to provide across the four provision categories is the same or higher than 2013 as shown in Table 13.6 above.

Delivery date certainty

13.44 The current contract for Ethernet services (the Connected Services Contract[301]) provides for Openreach to invoke what is termed "deemed consent", which effectively means it can change the CDD for a defined set of reasons without seeking its customers' express agreement prior to each individual change. Consequently and in light of the fact that over half of all orders take more than 30 working days to deliver (as explained above), customers' experience of changes to the CDD they were initially given has, in our assessment, been commonplace rather than exceptional.

[299] Data shown for 2014 includes January to November 2014 i.e. 11 months.
[300] Our analysis of the average time between order validation and the initial CDD is set out in paragraphs A17.146-147 of Annex 17.
[301] Published on the Openreach website at https://www.openreach.co.uk/orpg/home/products/ethernetservices/contracts/contracts.do

13.45 Between 2011 and 2014, 71% of all provide and regrade[302] orders for Ethernet products[303] completed by Openreach, were subject to at least one deemed consent change to their CDD. This is particularly the case where there is no pre-existing fibre in place and new build is required. Openreach identifies deemed consent changes to CDDs using 28 deemed consent codes.[304] Our analysis of the incidence of these codes and the delays to the provisioning process attributable to them, finds that both the most prevalent reason for delay and the greatest amount of delay, is related to the need for infrastructure build.[305]

13.46 We consider delivery date certainty on the basis of the proportion of orders that are subject to a change of date, and the number of changes per order. The evidence we have gathered demonstrates a divergence in the performance across provision categories. The certainty around the least complex Category 1 orders has improved, with fewer orders experiencing a date change, fewer changes per order when changes do take place, and therefore less time added to the overall lead time of the order due to changes taking place. However across provision categories 2, 3 and 4 these statistics have all deteriorated since 2011 as shown in Table 13.7 below.

Table 13.7: Propensity for changes to orders and the impact on lead times

Provision Category	Year	Proportion of orders changed	Mean volume of changes to lead time per order	Days delay due to date changes
All	2011	76%	3.0	23.0
	2014	71%	3.1	24.4
1	2011	64%	2.2	12.4
	2014	53%	1.5	8.3
2	2011	87%	3.8	31.0
	2014	88%	4.6	43.4
3	2011	95%	5.4	63.2
	2014	96%	9.9	129.2
4	2011	74%	2.2	14.0
	2014	83%	2.7	25.2

Source: Ofcom analysis of Openreach section 135 response dated 18 March 2015.

[302] To upgrade the product bandwidth e.g. 10Mbit to 100Mbit or to 1000Mbit or to change the product feature e.g. Standard to Local Access
[303] EAD, EAD LA, EBD, WES, WES LA, WES Aggregation, WEES, BES and Cablelink.
[304] See Table A17.9 at Annex 17 and explanatory text at paragraph A17.127 *et seq*.
[305] See Figures A17.12 and A17.13 at Annex 17.

13.47 More detailed analysis around lead time uncertainty – volumes of CDD changes and associated delays – can be found in Annex 17, paragraph A17.126 et seq and Table A17.17.

13.48 Prior to August 2008 the lead time for legacy WES, WEES and BES Ethernet products had been 57 working days also subject to 'deemed consent' provisions in the contracts. However EAD and EBD Ethernet based products have only ever been available on a notional 30 working day lead time subject to contractual 'deemed consent' provisions during the period 1 January 2011 to 31 July 2014 we considered for our analysis.[306] In practice though, as set out above, only a small proportion of orders are actually delivered within 30 days.

SLGs

13.49 The current SLA/SLG regime for provision requires Openreach to compensate its CP customers for late delivery of their order at a rate of one month's rental per day of delay. Openreach has argued that the current SLG regime is too onerous and should be revised.

13.50 In their responses to the April 2014 CFI, CPs have raised concerns over Openreach's ability to amend the CDD and thereby potentially mitigate the SLG liability. They have also noted over-use of the deemed consent mechanism, which they have at times successfully challenged, and identified the lack of information provided around CDD changes in particular and order updates in general, as an issue that leaves them exposed with their own customers.

13.51 Currently Openreach only becomes liable for SLGs if it fails to deliver against the "final" CDD it offers the customer and not the initial CDD. Notwithstanding this, we find that both the percentage of provisions subject to a SLG payment and the total value of provisioning SLGs has risen since 2011 and substantially so in 2013/14.[307]

Project Services

13.52 Some CPs also raised concerns that orders placed with Project Services – a premium coordination and management service offered by Openreach – received preferential treatment by Openreach. We have set out our analysis of how provision orders placed through Project Services compare with normal orders at paragraphs A17.157 to A17.160 of Annex 17. Our provisional view, based on the available information, is that we do not consider that there is evidence that Project Services orders received favourable treatment over the 2011 to 2014 period considered. (This is discussed further in Section 10 paragraph 10.46 *et seq*.)

Quality of service in provisioning performance between BT divisions and other CPs

13.53 We have also assessed whether Openreach's provisioning performance over the 2011 to 2014 period has given rise to any significant differences in the quality of service provided by Openreach to BT downstream divisions and that provided to other CPs. Our analysis is set out at A17.161 to A17.163 and includes a comparison of internal and external mean time to provide performance by order category and the incidence, frequency and impact of deemed consent on orders placed by BT

[306] Some of our analysis was extended to cover the additional period up to 30 November 2014.
[307] See Table A17.20 at Annex 17.

downstream divisions and other CPs. We provisionally conclude that, based on our analysis, there is no evidence of systematic bias.

Performance in keeping customers informed

13.54 We note also from the BDRC Quality of Service Report and comments in stakeholder responses to our April 2014 CFI, that there is a third important dimension of quality of service: clear, timely and comprehensive communication. We have limited evidence on which to reach a provisional view on Openreach's performance in this regard. To an extent at least, we consider it likely that concerns regarding Openreach's performance in providing clear, timely and comprehensive communications regarding order progression are a symptom of the deterioration in Openreach's performance in relation to delivery date certainty discussed above. In other words, as changes to CDDs through deemed consent and resultant delays have become more frequent and problematic for Openreach's customers, so the requirement for information about order progression from Openreach has become more important to customers. We discuss this further below in our assessment of the impact of poor performance on Openreach's customers.

13.55 However, we have assessed Openreach's performance in meeting KCI 1 – the completion of validation by 5pm on the following working day after an order has been placed; and KCI 3 – the 14 day target date for issuing customers a CDD.

13.56 In relation to order validation of EAD orders, our assessment is set out at paragraphs A17.119-120 of Annex 17. This shows that Openreach was meeting KCI 1 for approximately 95% of orders consistently during the period January 2011 to October 2012. Thereafter its performance has fluctuated significantly from month to month between a peak of 99% to a trough of 36%. For orders which were not validated by 5pm the next working day after the order was placed, the average impact of the delay has been relatively stable at just over 2 working days.

13.57 Turning to Openreach's performance against KCI 3 we set out our analysis at paragraph A17.143 -148 of Annex 17. Over the period November 2012 to July 2014 and excluding delays attributable by Openreach to its customers, we found that only Category 1 orders meet the 14 day target and have done so consistently over the period. For Category 2 orders the average time to issue its customers an initial CDD has been stable at approximately 27 working days. Performance for Category 3 orders fluctuates considerably and has deteriorated from around 50 days in 2012 to between 70 and 80 days in the first half of 2014.

Root causes of the deterioration of quality of service

13.58 We have considered the root causes of the deterioration in Openreach's quality service and investigated several potential causes based on our analysis of the data, monitoring of developments in the relevant markets and suggestions in CPs' responses to the CFI. While we were not able to isolate a single cause we note the following potential contributory factors:

- In February 2013 the Ethernet Strategic Transformation (EST) programme was halted and rolled back, introducing delays to process improvements and re-work to already submitted orders;[308]

- The deterioration in Ethernet service provision appears to have occurred over a similar period in which Openreach was engaged in the mass market roll out of Super Fast Broadband (SFBB). The data we collected from Openreach did not allow us to reach a conclusion on whether the deterioration in Ethernet service provision may be related to diversion of resources from Ethernet to SFBB. However, we did find that the increase in volumes for Ethernet was not matched by a proportionate increase in the resources available to undertake Ethernet related work. We therefore consider that while we cannot comment on why Ethernet was under-resourced, over the period we analysed, the evidence we have suggests that the level of resources did not keep pace with demand.

- Any incentives Openreach may have had to invest in maintaining or improving quality could have been outweighed by incentives to reduce costs, if for example it sought to comply with the charge control whilst maintaining its profitability; and

- The existing package regulatory measures intended to maintain quality of service, in particular the SLA/SLG regime, has not been effective.

13.59 In relation to resource levels, we compare in Table 13.8 below the first half of 2011 and 2014 to demonstrate the significant divergence in demand (59% increase) and resources (25% increase).

Table 13.8: Comparison of volumes and resources

	Accepted orders	Completed orders	Total kilo-man-hours	Ratio of resource to demand [✂]	Ratio of resource to completed orders [✂]
2011 H1	28,994	22,910	[✂]	30	38
2014 H1	45,992	28,373	[✂]	24	39
2011 H1 to 2014 H2	59%	24%	[✂]	-21%	1%

Source: Ofcom analysis of Openreach section 135 responses dated 22 October 2014 and 29 October 2014.

[308] The Ethernet Strategic Transformation (EST) programme was intended to replace existing ordering processes and operational support systems (OSS) with new processes and an OSS based on the Equivalence Management Platfom (EMP). The new processes and OSS suffered a number of issues causing the programme to be halted. The activity has recently been restarted on a trial basis.

Current developments

13.60 Openreach has undertaken a programme of process redesign in order to address the situation and has engaged with CPs and the OTA2 as part of this programme. Openreach's proposed changes currently being trialled include:

- Differentiated Order Journeys (DoJ) – the objective of this initiative is to revise the provision order journey and allow for variation of the lead time by order type based on a statistical analysis of historic lead times, among other process improvements. If this is successful we anticipate this will provide improved lead time certainty.

- Project Clarity – the objective of this initiative is to provide more information, on a more timely basis to CPs which should, if successful, improve CPs' ability to keep their customers informed about the status of their orders.

13.61 We support both these current initiatives and would encourage Openreach and CPs to continue to collaborate (facilitated by the OTA2) on these and other programmes intended to deliver improvements to quality of service. We are particular mindful, in our consideration of quality of service remedies in this review, not to de-rail the considerable efforts and progress made thus far in re-engineering the provision order journey.

Question 13.1: Do you agree with our assessment of Openreach's Ethernet provisioning process, how it has been working in practice, the root causes of performance deterioration and process developments? Does our assessment reflect your experiences and understanding of Openreach's wholesale Ethernet provisioning performance? If not, please explain why and provide us with any supporting evidence.

Our provisional conclusions on Openreach's performance

13.62 In this sub-section, we summarise our provisional conclusions on Openreach's quality of service performance.

13.63 We have analysed data relating to provision and regrade of Ethernet products between 2011 and 2014. Our aim was to confirm whether, and identify the extent to which, performance has deteriorated, and to understand whether the data provides us with any insight as to the causes of the deterioration, or any significant variations within the pattern of movements in lead times.

13.64 Our provisional findings demonstrate a clear deterioration in the frequency with which customers face changes to the delivery dates of their orders and the length of time they have to wait for the orders to be completed.

13.65 We have also included in our analysis, Openreach's performance in relation to Ethernet fault repair. This is set out in paragraphs A17.164-167 in Annex 17. Openreach's repair performance against the SLA of five hours for most Ethernet products has been fairly stable at about an average of 94% since 2011.

13.66 We note below the main conclusions we drew from the data:

- The overall mix of orders has not changed materially over the period. See Figure A17.29 in Annex 17.

- There is no evidence of a bias between the performance of BT and non BT orders. See Table A17.24 and Figure A17.23 in Annex 17.

- There is no evidence that orders that included the additional "Project Services" payable service received favourable treatment. See Tables A17.21 and A17.22 in Annex 17.

- There were notable variations in the degree of deterioration in lead times by order type. Category 1, the simplest order type, showed no change at 29 days. However the remaining order types all showed a deterioration, with Category 3 significantly different from the others increasing from 64 days to 133 days.

- Between H1 2011 and H1 2014 we have observed a 59% increase in the number of accepted orders. Over the same period we have identified a 25% increase in the man hours expended by Openreach on Ethernet provisioning. We could not identify a gain in efficiency to explain the difference between the growth in orders and the lower corresponding increase in man hours, as the hours per completed order have not reduced over the period. Furthermore, as noted above, we have not observed a material change in the mix of orders.

- Openreach's Ethernet repair performance has generally been maintained at a good level since 2011. See Figure A17.27 and A17.28 in Annex 17.

13.67 Based on the evidence we have obtained from Openreach about its Ethernet provisioning performance under statutory information gathering powers, which we have summarised above and set out in detail in Annex 17, our provisional findings essentially confirm the concerns which stakeholders raised in response to the CFI about the declining quality of service performance Openreach has been providing in the provision wholesale Ethernet services since 2011.

13.68 As a result of our analysis we provisionally conclude that Openreach performance has deteriorated over key dimensions of service quality, and from our analysis of the available data we provisionally conclude that this has been caused in part by under resourcing and the failure of the EST programme.

Question 13.2: Do you agree with our provisional conclusions on Openreach's performance? If not, please explain why and provide us with any further supporting evidence.

The impact of poor performance on Openreach's customers

13.69 In this sub-section we consider the potential impact that poor quality of service delivered by Openreach has on CPs, in order to inform our assessment of what form of remedies we should propose to address our concerns regarding quality of service.

13.70 Given that recent Openreach repair performance has largely been acceptable, we focus in particular on the impact of long and uncertain lead times in provisioning. Our assessment is informed by responses we received from CPs to statutory information requests and the CFI.

13.71 Using our statutory information gathering powers we asked CPs to describe any costs that they consider they incur as a result of Openreach's performance. These costs could be direct (e.g. additional staff overhead associated with obtaining updates from Openreach) or indirect (e.g. reputational damage).

Direct costs

13.72 BT Business and BT Global Services noted that it was not practically possible to estimate the amount of any costs incurred as a result of Openreach's performance. However, both divisions did say that it was reasonable to assume that Openreach performance issues would translate into increased activity in terms of managing customers and Openreach. Further, it was noted that such increases in activity may eventually trigger the need for incremental expenditure in the form of extra manpower and/or system development.

13.73 BT Wholesale explained that because Openreach services usually form part of wider Ethernet based solutions, it was difficult to separately identify costs attributable to Openreach performance issues. However, it did provide an example of a specific cost that it had incurred, [✂ ✂], in relation to additional manpower. [✂ ✂]

13.74 Colt noted that it had not attempted to assess the overall costs associated with Openreach's performance. [✂ ✂].

13.75 KCOM noted that while it could identify areas where Openreach's performance had affected its costs, it was in practice impossible to attribute a value to the overall impact. KCOM explained that Openreach performance issues would have resource implications in terms of its staff having to manage both customers and Openreach. KCOM also noted that late delivery of a service could result in increased compensation payments to its customers, and that its large corporate and public sector customers often required particularly significant contractual compensation commitments. KCOM's liability to make compensation payments is affected not just by its own performance, but by the performance of any third parties (such as Openreach) that it contracts with as part of the delivery of a service.

13.76 [✂ ✂]

13.77 [✂ ✂]

- [✂ ✂]

- [✂ ✂]
- [✂ ✂]
- [✂ ✂]

13.78 TalkTalk noted that Openreach performance issues had led to recruitment of an increased number of TalkTalk staff, who would not otherwise be needed, to manage communications with its affected end users. TalkTalk considered that charges payable to Openreach for dedicated job control, jeopardy management and/or Project Services were direct costs associated with poor Openreach performance.

13.79 [✂ ✂]

13.80 Vodafone estimated that the "Openreach service crisis" had resulted in a 15% increase in its service desk workload. Vodafone noted that contacting Openreach (e.g. to chase orders and obtain updates for its customers) accounted for 60% of this additional workload. The remaining 40% was attributed to activities such as updating internal systems with revised order information, or contacting customers directly to keep them informed as to their order's progress. Vodafone also stated that it has been actively challenging Openreach deemed consent declarations since February 2014; a task which it described as "very time consuming".

13.81 Vtesse noted that because it employs a number of contract staff on a project-by-project basis, that any slippage in projects due to Openreach lead time issues increases its overhead costs. Vtesse also cited additional field engineering visits and management overheads as sources of increased costs that it incurs as a result of poor Openreach performance.

Indirect costs

13.82 BT Business and BT Global Services acknowledged the possibility that their customers could become dissatisfied to the point of cancelling orders, or be less likely to engage in incremental business with BT Business and BT Global Services in the future. KCOM and TalkTalk raised similar concerns relating to reputational damage potentially harming future business opportunities.

13.83 Vtesse also considered that its loss of credibility and failure to deliver, due to Openreach delays, had cost it further business from some customers and/or prevented new business. It described selling to end customers in an environment where lead times for EAD services ranged from 40 to 200 working days as challenging. Vtesse claimed that the sum of direct and indirect costs attributable to Openreach exceeded the SLG payments that it had received, and stated that it would prefer that this money was instead spent on improving Openreach's quality of service.

13.84 Finally, KCOM drew attention to the opportunity cost of using staff in a particular way due to Openreach performance issues. For instance, staff (providing that they would

have been employed absent any performance issues) engaged in increased communications with customers and Openreach would have been engaged on other customer issues/orders.

Ofcom's assessment

13.85 The responses we have received from CPs, both BT divisions and other CPs, on the direct and indirect costs of Openreach's performance issues are consistent.

13.86 Whilst most CPs have been unable to provide us with details of the actual costs they have incurred as a result of Openreach's performance, it is evident to us that, at the very least, CPs purchasing material volumes of wholesale Ethernet services from Openreach have incurred costs in the increased activity they have experienced particularly in terms of managing their customers and Openreach. In some cases, CPs report recruiting more staff as a result. All CPs report they have incurred or were likely to have incurred costs as a direct result of the deterioration in Openreach's provisioning performance. Some CPs also commented on cancellations of orders due to provisioning problems and/or the loss of business either due to reputational damage to themselves or more generally in selling products to market where the date of delivery of wholesale inputs is uncertain.

13.87 We are unable to quantify the effects on competition as we have insufficient information on which to reach any provisional conclusions on the distributional effects at the retail level. We consider it unlikely that the impacts of Openreach's performance has had no effect on competition at the retail level. We do, therefore, provisionally conclude that the deterioration in Openreach's provisioning performance at the wholesale level has had a detrimental effect downstream.

Question 13.3: Have we accurately captured the reported impact of poor performance? If not, please explain why and provide us with any further supporting evidence.

Openreach's incentives to deliver acceptable Ethernet provisioning quality of service

13.88 We now consider the incentives that apply to Openreach in the context of the existing remedies which we imposed in the 2013 Review. As set out above, the existing package of quality of service remedies comprise:

- the obligation to provide Ethernet services on an EOI basis;
- a requirement to publish quality of service information as directed by Ofcom;
- a requirement to publish a Reference Offer which includes SLAs and SLGs, requirements; and
- an SLA/SLG regime requiring Openreach to provide specified SLG payments in respect of provisioning and repair.

13.89 We note that while repair performance has generally met the required standards, provision and installation performance has been detriorating since 2011. We are therefore concerned that the current mix of commercial incentives and regulatory remedies are not having the desired effect of maintaining a reasonable quality of service.

Competing Priorities

Incentive to accelerate revenue

13.90 Long lead times and deferred installation delay revenue. While this may be considered an incentive to shorten lead times our assessment is that the incentive for Openreach to accelerate revenue through quick delivery, is weak at best.

13.91 The impact of this effect is shown in Table 13.9 below for a single Ethernet leased line over a 3 year contract. We assume an EAD 100 with a connection fee of £1,900, and annual rental of £2,400 discounted by the Openreach WACC of 10.8%. The Net Present Value (NPV) to Openreach of the revenue streams associated with rental payments for the Ethernet service is calculated based on a "Fast" scenario and a "Slow" scenario – where the "Slow" scenario is 30 days delayed.

Table 13.9: Impact of late provisioning incentive

Nominal revenue flow for EAD 100

	Fast (£)	Slow (£)
Month 1	1,900.00	-
Month 2	200.00	1,900.00
Month 3	200.00	200.00
Month 4	200.00	200.00
Month 35	200.00	200.00
Month 36	200.00	200.00
Month 37	-	200.00
Total	**8,900.00**	**8,900.00**
NPV	7,856.84	7,789.98
Difference		£66.86
Difference % of NPV		0.86%

13.92 The benefit to Openreach of receiving faster payment under the "Fast" relative to the "Slow" scenario would be just under £67 in net present value terms. This is 0.86% of the NPV of the circuit and is unlikely to have a material effect on behaviour.

Incentive to grow volume

13.93 There are two variants of volume effect that may incentivise Openreach. The first is volume loss to competition. Notwithstanding the deterioration in performance we have observed over the period 2011 to 2014, our assessment of the wholesale Ethernet markets provisionally finds that BT's service shares have remained high as discussed in Section 4. This indicates that there is unlikely to be a competitive volume effect.

13.94 The second effect is whether the poor level of service has an impact on the overall level of volumes in the market and whether there is pent up demand that would be released if quality of service was better, i.e. by improving its quality of service, Openreach could grow its own revenue base. The hypothesis that uncertainty and long lead times make businesses defer investment decisions is compelling. However the evidence is that volumes are rising steadily, in spite of the quality of service problems, and therefore we would have to hypothesise even higher potential volumes for this to be a factor.

13.95 Table 13.9 above showing a comparison of volumes and resources shows sustained medium term growth in Ethernet order volumes accepted by Openreach over the period 2011 to 2014.

13.96 Even if higher volumes are possible there could in turn be a disincentive to quality of service, if Openreach's systems, resourcing and supply chain were unable to meet the higher level of demand. Given the struggle to deliver adequate service at current volumes, it is worth considering that higher volumes may not actually be desirable until Openreach's ability to deliver has been improved, i.e. degrading quality of service and braking the rate of volume growth is a rational strategy through the short to medium term if Openreach believes that higher demand would only lead to greater failure.

13.97 Consequently it is not clear that there are positive volume based incentives on Openreach to improve its quality of service.

Incentives from existing KPIs and Reference Offer requirements

13.98 The commitments Openreach makes to its customers are covered in the Connected Services Contract – in effect the Reference Offer. This specifies, among other things, the expected lead times for provision, and the circumstances in which SLG payments will be made, with the supporting caveats. In principle we would expect the standard lead time to reassure customers regarding the timeliness of the delivery of their order, and the SLG arrangements to reassure them with regard to certainty.

13.99 However as we note above the influence on Openreach behaviour of the initial CDD and expected lead times may be reduced through the use of deemed consent, and we observe that the expected lead times are often not met in practice. We therefore conclude that the Reference Offer has no incentive effect with regard to maintaining quality of service.

13.100 Openreach also publishes KPIs in the form of a review pack presented to a forum of CPs and the OTA2. Ofcom are represented on this forum, but only in an observing capacity. There may be an incentive effect from poor quality of service being exposed to external scrutiny, and data being provided to support representations to Ofcom. However, we note that until September 2014[309] the KPIs which Openreach routinely shared directly with Ofcom presented the internal quality of service measure for Openreach which was compliance to the final CDD given to the customer, and therefore after the application of deemed consent(s). This metric allied to the SLA/SLG regime appeared to us to incentivise Openreach to achieve a higher level of performance and stability. It is only recently, during the period of collaboration with industry over revised processes, that the more meaningful measure of achievement of the initial CDD has been shared. This has demonstrated markedly poorer performance in line with the statistics we have presented in this review. We therefore conclude that the KPIs had no incentive effect until they were amended to the more relevant statistic, and since then have been a useful enabler to the discussions between Openreach and industry.

[309] Completion performance to initial CDD first reported by Openreach to Ofcom in its Monthly Service Review of 16th October 2014.

Incentives from the existing SLA/SLG regime

13.101 Under the existing SLA/SLG regime for provision, Openreach is required to offer customers an installation date, and pay compensation for missing this date at a rate of one month's rental revenue per day of delay.

13.102 Openreach states that there is "an onerous SLA/SLG regime for its Ethernet products covering both provision and repair scenarios".

13.103 CPs on the other hand are concerned that Openreach uses deemed consent to avoid / minimise SLG outpayments as there is no mechanism to control whether Openreach is reacting to unforeseeable factors, or potentially covering its own failure.

13.104 The SLG on provision applies to the final issued CDD, rather than the initial CDD. Hence, while the payment for missing this date may be onerous, the date itself can be changed repeatedly.

13.105 The SLG may in fact be acting as a disincentive to deliver improved lead times and a high level of adherence to the initial CDD, as the risk of triggering the SLG, as currently specified, can be mitigated through the setting of longer lead times and making changes to the dates as required.

13.106 We have set out above our analysis of the NPV loss to Openreach for deferring installation on an EAD 100 circuit by one month which we estimate at £67 for a three year contract. However the loss from missing a CDD by one day is a full month of rental at £200. See Table 13.9 above.

13.107 In order to entertain the risk of missing the CDD on one circuit by one day, we estimate Openreach would need to be certain it could successfully accelerate delivery of 3 circuits by one full month.

13.108 Hence we consider that the current provision SLA/SLG regime is at risk of being circumvented by the uncontrolled use of deemed consent, and does not assist in giving customers certainty over their delivery date.

13.109 We conclude therefore that the current package of remedies and other commercial and reputational factors are inadequate to incentivise Openreach to deliver acceptable levels of quality of service for Ethernet provisioning.

Question 13.4: Do you agree with our assessment of Openreach's incentives to deliver acceptable Ethernet provisioning quality of service? If not, please explain why and provide us with any further supporting evidence.

Proposed minimum standards for Ethernet provisioning and repair quality of service

Our considerations

13.110 We have set out above our considerations on quality of service for Ethernet repair and provisioning activities including our analysis of performance and the impact of poor performance on CPs, the market research we commissioned to understand end customers expectations on quality of service and the incentives on Openreach to deliver an acceptable level of quality of service, including the package of remedies imposed in the 2013 Review.

13.111 We consider on the basis of the available evidence, that quality of service performance for provisioning is not acceptable and has been in decline for a significant period of time. Our analysis shows that Openreach's quality of service performance was materially better in 2011. We note that Vodafone's response to the CFI highlighted March 2010 as the point at which Openreach's performance became unstable in their view.[310] We cannot say for certain whether Openreach's performance was better still prior to 2011 as we find the pre-2011 data to be insufficiently reliable to draw such provisional conclusions.[311] We have also provisionally concluded that, in general, quality of service for repair has not deteriorated or become unstable and has been maintained at acceptable performance levels. Our objective is that repair performance should remain at an acceptable standard. In considering our proposals for remedies we are mindful that repair performance could decline as a consequence of Openreach diverting resources to improve provisioning.

13.112 We also consider on the available evidence that the current regulatory and contractual arrangements have not been sufficient to ensure that Openreach maintains its quality of service in the supply of Ethernet provisioning services to a sufficiently high level to prevent material detriment to downstream competition and/or end customers in the relevant markets and absent further ex ante regulation this is likely to persist over the forward looking period of this review.

13.113 We therefore propose to impose remedies on Openreach covering Ethernet provisioning and repair activities to incentivise improvement of Ethernet provisioning and discourage future repair performance degradation, unintended or otherwise, as a consequence of provisioning improvements and or increases in repair demand.

13.114 In this sub-section, we consider first the principles, scope and other factors around which we have designed the proposed suite of minimum standard measures. We then set out each of the proposed minimum standards in turn; we outline its purpose, the basis on which the specific measures have been set, and the supporting evidence.

Principles for the design of minimum standards

13.115 In terms of the design of our remedies and in addition to the requirements to be evidence based and proportionate we also considered it important to observe the following principles:

- The design should acknowledge the complexity and variety in Ethernet order types;
- The design should recognise the trade-off between delivery date certainty and the time to provide (i.e. greater certainty over the actual delivery date can be more readily achieved by extending the period between order acceptance and final completion);

[310] P10, Vodafone, Non-confidential response to April 2014 CFI, 10 June 2014, http://stakeholders.ofcom.org.uk/binaries/consultations/business-connectivity-market-review/responses/Vodafone.pdf

[311] See paragraph A17.113 *et seq* at Annex 17 concerning the availability and integrity of Ethernet provision and repair performance data.

- The design should not be tied to any *categorisation* of orders that may exist from time to time, as this may change;
- The design should not be tied to any *business processes* that may exist (or are proposed) as these may change; and
- The design should balance the timely issuing of a CDD with the probability of that CDD being met.

13.116 Based on these principles we considered a number of possible approaches to incentivise Openreach to improve its quality of service performance in Ethernet provisioning activities.

13.117 We considered at an early stage that any remedies we propose should not, as far as possible, seek to specify or interfere with the design of the new provisioning process, the so called "Differentiated Order Journey" (DoJ), which had started to be discussed between Openreach and the CPs in the OTA2 facilitated industry meetings. We considered that industry is better placed to specify and develop new processes. We considered that remedies attempting to directly control the design of the provisioning process were more likely to lead to unintended consequences.

13.118 We also considered whether we should address the issue of date certainty by specifying specific rules as to the use of deemed consent. However we considered that this approach may also lead to unintended consequences or interfere with the development of the new industry process.

13.119 We also considered changing the SLA/SLG regime, but again we considered that in the context of the new process being specified by industry, this approach also risked unintended consequences. Our view is that while a change to the SLA/SLG regime may well be required once industry has developed and implemented a new provisioning process, we consider that industry is better placed to negotiate and agree what the appropriate regime should be going forward.

Scope and other factors in the design of minimum standards

13.120 We set out below the considerations we have given to the scope and other factors in the design of the minimum standards we propose.

13.121 We consider:

- the products to which the standards will apply;
- the factors influencing quality of service that we propose to include and exclude from the metrics; and
- our other considerations in applying standards over time and on a national basis.

The products to which the minimum standards apply

13.122 We propose the minimum standards should apply to the main volume driving order types of "provide" and "regrade" for EAD and EAD LA which account for the vast majority of Ethernet orders. We also apply our proposed minimum standards to EBD, Cablelink services, and variants of or replacements for all of these above mentioned services including EAD/EAD LA.

13.123 We considered applying the minimum standard to legacy Ethernet services such as WES, WES LA, WEES, BES, etc. However we recognise that many of these products have been or are in the process of being withdrawn with consequent falling volumes. We propose that it would be inappropriate to impose minimum standards on these products.

13.124 We have also considered applying the minimum standards to Openreach's Optical services (WDM products such as OSA and OSEA). However, in light of the fact that responses to our CFI had a clear focus on concerns surrounding Ethernet provisioning, we did not include Optical services in the early information gathering stages of our review. We also note that, in comparison with Ethernet services, these products account for much smaller volumes so would be unlikely to make a material difference to the overall lead times achieved.[312]

13.125 However, in respect of both legacy Ethernet products and Optical services we consider that our proposed quality of service remedies may encourage improvements in Openreach's leased line fibre provisioning processes and performance more generally. We consider that it is unlikely that Openreach would operate substantially different order and provisioning processes for these other products which are delivered in much the same way.

Inclusion/exclusion of various factors

13.126 Our analysis highlighted various causes of poor provision performance some of which are outside Openreach's direct control. We have considered the following three main factors:

- Customer caused delay – delays attributed by Openreach to its customer (or further downstream) and which are identified by certain deemed consent codes in Openreach's systems which are shown in Table A17.9 in Annex 17;

- Non-customer caused delay (including delays caused by third parties) – delays attributed by Openreach to either itself or third parties. Third parties may include, for example, land owners and/or local authorities where Openreach may be delayed during the delivery process whilst seeking permission to build on private property or carrying out street works. These are also identified by certain deemed consent codes in Openreach's systems which are shown in Table A17.9 in Annex 17; and

- MBORC (Matters Beyond Our Reasonable Control) – delays which Openreach attributes as being, for example, a *force majeure* event such as extreme weather conditions.

13.127 We propose to exclude customer caused delay from the minimum standards we are proposing. This will limit the potential for Openreach's customers to game the minimum standard measures, and focuses the minimum standard on Openreach's performance. We also propose that delays caused by customers be excluded from most of the KPIs we propose (discussed later in this section) to require Openreach to provide for assessment of their compliance with our minimum standards and for other reasons.

[312] See Section 8 of BT's Regulatory Financial Statements for 2014 at http://www.btplc.com/Thegroup/RegulatoryandPublicaffairs/Financialstatements/2014/Current_Cost_Financial_Statement_2014.pdf

13.128 We propose to include non-customer caused delays in the minimum standards. Our analysis revealed that it is most of these delays are wholly or partially within Openreach's control, although third parties do contribute to some of the delays. Excluding, or providing relief for, the non-customer caused delays would remove any incentive on Openreach to improve to the extent that issues are within its control. Whilst including the non-customer caused delays within the minimum standard does include some delay not within Openreach's direct control, we consider that this should incentivise Openreach to manage the process, of interaction and delay relating to third parties better so as to obtain the best outcome. Therefore we have included non-customer caused delays (including Third Party in Openreach/industry terminology) in the metrics we have used and we do not propose to allow any relief against the standards for this cause of delay.

13.129 We propose to include MBORC in the minimum standards. MBORCs are usually raised when Openreach's network has experienced serious damage caused by weather or third parties, or weather prohibits Openreach staff from attending sites where installation or repair work is required. The principle purpose of MBORCs is the suspension of SLG payments for the region and period covered by an active MBORC. We consider that events leading to MBORC declarations are much more likely to affect minimum standard performance measures relating to repairs than provision orders because of the short period (typically 5 hours) within which repairs should be completed.

13.130 Excluding delays due to events covered by MBORCs could incentivise Openreach to use MBORC declarations as a means of addressing potential minor minimum standard non-compliance issues or generally become less rigorous in its application of MBORC management criteria.

13.131 We also investigated the likely impact of including MBORCs in our proposed minimum standards. We specifically asked Openreach for provision performance data using our formal powers to separately identify the extent to which MBORC related events contributed to delays in provisioning. No significant levels of delay were identified, as illustrated in Figures A17.12 and A17.13 in Annex 17. The repair performance data similarly contained faults covered by MBORC declarations. We note that the proportion of repairs completed within SLA performance was good throughout the period January 2011 to July 2014 that we analysed. We also note that during late 2012 when the UK experienced severe flooding arising from the second highest level of rainfall since records started in 1910, repair performance actually improved, although it did decline (but only to 91.5%) in January 2013 after which it recovered rapidly. This demonstrates that Openreach is able to re-prioritise resources to meet targets where necessary or that the weather and consequent flooding occurred in regions where there is low Ethernet service presence or both.

13.132 Therefore we have included existing MBORC events in the metrics we have used and we do not propose to allow any relief against the standards for this cause of delay.

Question 13.5: Do you agree that it is appropriate to exclude customer caused delays from the minimum standard performance measures for provision activities? If not, please explain why.

Question 13.6: Do you agree that it is appropriate to include the "non-customer" delays (also including Third Party delay in Openreach data) in the minimum standard performance measures for provision activities? If not, please explain why.

Question 13.7: Do you agree that it is appropriate to include delays due to events covered by MBORC declarations in the minimum standard performance measures for provision and repair activities? If not, please explain why.

Other considerations regarding the application of minimum standards

13.133 We also consider whether the minimum standards should apply nationally or to individual regions.

Minimum standards should apply at a national level

13.134 We propose to assess performance standards on a national level. This is because the volumes of Ethernet orders are relatively low and we are concerned that applying minimum standards at a more granular (e.g. regional) level may include statistically invalid sample sizes.

13.135 We do however propose that KPIs should apply at a regional level to provide transparency and mitigate the likelihood of any regional bias.

Question 13.8: Do you agree that it is appropriate to apply the minimum standards nationally? If not, please explain why.

Minimum standards over time

13.136 Finally, we have considered when the minimum standards should come into force. Our provisional view is that Openreach should be required to meet the standards, in full, as soon as is reasonably practicable in order to address our concerns regarding the detriment to competition and customers of unacceptable quality of service performance.

13.137 However, in setting mandatory minimum standards for the first time, we recognise the need for Openreach to organise and resource itself appropriately in light of these proposed remedies. Openreach is developing changes to its order handling processes and systems to enable performance improvements. The timescales of these developments are currently uncertain.

13.138 We therefore take this into account in our proposals for setting minimum standards over the three year period of this review. In relation to fault repair, we seek to ensure that the current repair performance is maintained throughout the review period and therefore propose a single minimum standard that applies in each of the three years of the review period. In relation to our proposal to impose a minimum standard on delivery date certainty[313] we propose requiring that Openreach should significantly improve on its current performance from Year 1 of the review period. With regard to our proposal to impose minimum standards on lead times, our proposals would require Openreach to deliver improvements from Year 2 of the review period. In proposing that Openreach would not be required to deliver improvements in lead times before Year 2, we have taken into account the uncertainty in the timescales of Openreach's necessary process and systems developments. However, our proposal would require that Openreach ensures that it, as a minimum, maintains its current lead time performance in Year 1. In practice, we consider that in order for Openreach

[313] In relation to which our research shows that although end-users would like the delivery of their services within shorter lead-times, they attach greater importance to certainty that their services will be delivered on agreed dates.

to prepare itself to meet the minimum standards applying to lead times in Year 2, it will likely need to out-perform its Year 1 lead time obligations and therefore these should be seen as an absolute floor rather than an expected performance standard.

Question 13.9: Do you agree with our proposals regarding the application of minimum standards over the three year period of this review? If not, please set out your reasons and alternative proposals.

Proposed minimum standards

13.139 We propose a package of measures which is intended to ensure that (i) fault repair performance is maintained at current levels, (ii) customers receive greater certainty over when their order will be delivered, and (iii) the time taken to deliver the order returns to levels which Openreach was delivering in 2011 - their best past performance for which we have reliable data. Our package of measures includes setting:

- minimum performance standards on order completions against initial contractual delivery date;
- minimum performance standards on provisioning lead times; and
- maintaining minimum performance standards on repair.

Set minimum performance standards on order completions against initial contractual delivery date

13.140 In order to ensure improvements in delivery date certainty for its customers, we propose requiring BT to meet the minimum standards set out in Table 13.10 below.

Table 13.10: Proposed minimum standards for orders achieving the initial CDD

		New minimum standard		
	Current performance (2014)	**Performance over Year 1 (2016/17)**	**Performance over Year 2 (2017/18)**	**Performance over Year 3 (2018/19)**
% of orders completed on or before initial CDD	circa 45%	80%	85%	90%

13.141 This minimum performance standard requires Openreach to complete the delivery of 80% of orders on or before the initial CDD it provides to its customers over the course of the first year. By the end of the third year of the review period we propose that Openreach should have surpassed its current DoJ proposals for improved delivery date certainty and deliver 90% of orders to the initial CDD over the course of this final year. We explain how and why we have derived the minimum standards set out in Table 13.10 above later in this sub-section.

13.142 Simply setting a minimum standard for delivery against initial CDD may not achieve our objective of ensuring greater delivery time certainty for Openreach's customers. We are concerned that this proposed regulatory intervention might incentivise Openreach to provide its customers with initial CDDs which are beyond our proposed minimum standards on the actual time to provide Ethernet services (which we discuss below).

13.143 Even though we are also proposing to intervene to require Openreach to meet minimum standards on how long it takes to complete an order from its validation, this would not (of itself) prevent Openreach from providing its customers with initial CDDs which are set well beyond these maximum lead times. This would not achieve our objective of greater delivery date certainty as customers may likely find their orders being routinely completed in advance of when they had originally planned and expected completion (i.e. the initial CDD would continue to be susceptible to change but bringing the delivery date forward rather than backward). We consider that such an outcome would be similarly frustrating for customers as the present situation where their orders are routinely delivered after the initial CDD through changes to the CDD delaying the order.

13.144 To address this concern we therefore propose additional controls on the setting of the initial CDD requiring it to conform to the same profile as the Time to Provide (TTP) minimum standards proposed and defined below. For example, over the first year, 40% of the initial CDDs which Openreach provides to its customers must be 30 working days or less; no more than 3% of initial CDDs should be more than 159 workings days and, the average of initial CDDs must be no more than 46 working days. We consider this is a reasonable and proportionate intervention to ensure the objective of greater delivery date certainty is achieved and in a manner which is consistent with our proposals to apply minimum standards on the time taken to deliver orders.

13.145 We also consider that there is a risk that Openreach could be incentivised by our proposed intervention to delay issuing initial CDDs to its customers until so late in the process that its achievement is certain. This would render the initial CDD virtually meaningless to customers. As we do not want to pre-empt the process improvements currently under development by industry, we do not propose to specify a timescale by which Openreach should issue a CDD once it has accepted an order. We consider instead that Openreach and industry should agree on a point in the process at which this CDD will be offered. We consider the industry participants better placed to determine this point, and do not wish to tie the standard to a particular process design.

Deriving the minimum standards for completion against initial CDD

13.146 We have considered what metrics might be appropriate for setting a minimum standard with respect to completion against initial CDD, a measure we consider is necessary to improve customer certainty that an order will be delivered to the original timescales set by Openreach.

13.147 The BDRC Quality of Service Report and BEREC survey research we undertook does not provide us with any suitable metrics that could help us define this. The only evidence we have available to us is Openreach's recent performance[314] and the targets Openreach and industry have been discussing in the context of DoJ.

13.148 We consider that an efficient operator is unlikely to achieve 100% compliance as this may require the operator to maintain excess resource to deal with spikes in demand. In the 2013 Review, in relation to SLG costs, we said that we would not expect an efficient firm to necessarily be resourced up to a level such that they would never have to make such payments. The resource commitments required to ensure that

[314] From the October 2014 Openreach Monthly Service Review which detailed completition to initial CDD from April 2014.

SLAs are always met are likely to be very significant and therefore involve quality of service costs that would unlikely be at an efficient level.[315] Consistent with that approach, and in recognition of the difficulty in precisely identifying an efficient level of performance and the uncertainties inherent in Ethernet provisioning, we therefore propose that 90% for the initial CDD percentage compliance represents a reasonable and proportionate metric to specify a minimum standard for delivery date certainty by the end of this review period (i.e. performance in Year 3 2018/19).

13.149 To establish what initial metric might be appropriate for the initial CDD percentage compliance, we considered what performance Openreach achieved in 2014 and what performance target Openreach has adopted for the DoJ trial which is currently ongoing.

13.150 Openreach's performance in 2014 with respect to the initial CDD percentage compliance was about 45% (although this varied between circa 30% to 60%). For the DoJ trial, Openreach is proposing an initial CDD percentage compliance level of 80%. Given that we anticipate from discussions with Openreach that the new process based on DoJ will be rolled out to most if not all of Great Britain plus Northern Ireland before the start of the new charge control period, we consider the 45% figure to be unduly low as a minimum standard. We therefore believe it appropriate and proportionate to set the initial metric for the initial CDD percentage compliance minimum standard to be 80% in Year 1 2016/17 (i.e. the same as the target adopted by Openreach in consultation with other CPs in industry fora facilitated by the OTA2 as being appropriate for the purposes of the DoJ trial).

13.151 Having identified the proposed metrics which we consider are appropriate to apply, as proposed minimum standards for Years 1 and 3 of the review period, we consider it reasonable to propose, in the absence of evidence which might suggest a different approach, that the metric for Year 2 should be halfway between the two metrics i.e. 85%.

13.152 Our provisional conclusions for our proposed intervention to provide customers with greater delivery date certainty are summarised in the Table 13.11 below.

Table 13.11: Parameters and metrics for delivery date certainty minimum standard

Parameter	Initial metric	Final metric
Maximum initial CDD values	Maximum values to be the same as the TTP limits in the lead time minimum standard.	
Initial CDD issue date	To be agreed by Openreach and industry	
Initial CDD percentage compliance	80%	90%

Question 13.10: Do you agree that it is appropriate to use a combination of initial CDD and TTP as the basis around which to set the new delivery date certainty

[315] Paragraphs 18.45-50, Ofcom, *Business Connectivity Market Review, Review of retail leased lines, wholesale symmetric broadband origination and wholesale trunk segments, Statement*, 28 March 2013, http://stakeholders.ofcom.org.uk/binaries/consultations/business-connectivity/statement/Sections17-24.pdf

minimum standards? Please provide reasoning for your answer. If you do not agree, please also give your proposed alternative including reasoning.

Question 13.11: Do you agree that it is appropriate to set the metrics for the delivery time certainty minimum standard to the initial value of 80% and final value of 90%? Please provide reasoning for your answer. If you do not agree, please also give your proposed alternative.

Set minimum performance standards on provisioning lead times

13.153 In order to ensure improvements in reducing lead times for its customers, we propose requiring BT to meet the minimum standards shown in Table 13.12.

Table 13.12 Proposed time to provide minimum standards for orders

			New minimum standard (Working days excludes customer caused delays)		
	2011 performance	**Current performance (2014)**	**Performance over Year 1 (2016/17)**	**Performance over Year 2 (2017/18)**	**Performance over Year 3 (2018/19)**
Mean time to provide across orders	40 working days	46 working days	No more than 46 working days	No more than 40 working days	As Year 2
Lower percentile limit	40% of provisions delivered in 29 working days	40% of provisions delivered in 30 working days	At least 40% of provisions delivered in 30 working days or less	At least 40% of provisions delivered in 29 working days or less	As Year 2
Upper percentile limit	3% of provisions delivered in 118 or more working days	3% of provisions delivered in 159 or more working days	No more than 3% of provisions delivered in 159 or more working days	No more than 3% of provisions delivered in 118 or more working days	As Year 2

13.154 Our objective is to restore performance to the level Openreach was achieving in 2011, the best year for which we have reliable data. These lead time reduction standards require Openreach to make significant improvements over a two year period. The final (Year 2) minimum standard is based on Openreach's actual performance in 2011.

Deriving the minimum standards for lead times

13.155 Openreach's lead time performance expressed as the percentage of orders exceeding a given TTP is set out in Figure 13.2 below, which clearly shows that performance was better in 2011 than in 2014.

13.156 We consider 2011 as a suitable benchmark for the following reasons:

- The performance in 2011 largely predates the deterioration in lead times for which we have received submissions;
- The data for periods earlier than 2011 is incomplete and did not allow detailed analysis by order category, leading to uncertainty in our analysis;

- The performance in 2011 is demonstrably an achievable standard around which we can practically set a baseline, or minimum level of performance; and

- The performance in 2011 was delivered in a charge controlled environment and was therefore affordable for Openreach at that time.

13.157 We have also considered the evidence from the BDRC Quality of Service Report and our comparison with other European countries which we have summarised in paragraph A17.203 *et seq* in Annex 17. We provisionally concluded that the BDRC Quality of Service Report indicated that end-users were likely to be most satisfied where lead times are around 30 working days but that longer lead times may be acceptable to end-users provided the delivery date is guaranteed and delays are minimised. To the extent we could draw any comparisons from other European countries, we provisionally concluded that advertised lead times for less complex orders where fibre is already present appeared to be in the range of 30 to 40 working days.

13.158 We consider that setting our minimum standards for lead times by reference to what we know Openreach has delivered in the past, is the most robust approach. Moreover we note that the metrics we have derived based on this approach seem reasonably consistent with these other benchmarks which we have also considered. Consequently, we propose that:

- the performance for 2011 is an appropriate final metric (good performance) for provision lead time performance; and

- the performance for 2014 is an appropriate initial metric (poor performance) for provision lead time performance.

13.159 Given the complexity of Ethernet orders, we need to consider carefully how the minimum standard should be applied. We do not consider setting a single mean TTP target to be sufficient, in that Openreach could choose to make a significant improvement to some of the longest lead time orders, and achieve a target mean TTP, without delivering benefits to the majority of customers. We also do not wish to see the good performance of the simpler orders with the shorter TTPs sacrificed while the more complex orders with longer TTPs are improved. However we also want to avoid prescribing lead time for specific order categories as we believe industry is better placed to do this.

13.160 Therefore, in addition to retaining the mean TTP as a minimum standard target, because it provides a useful and easily understood indication of overall performance, we also consider it appropriate to incentivise:

- an improvement to the longer lead times with an upper percentile limit; and

- maintenance of the shorter lead times with a lower percentile limit.

13.161 Hence we need to specify the following parameters for the initial (2014) and final (2011) metrics discussed above in order to set a comprehensive lead time target over the three year review period:

- mean TTP minimum standard values;

- an upper percentile percentage and corresponding minimum standard values for the upper percentile; and

- a lower percentile percentage and corresponding minimum standard values for the lower percentile.

13.162 Deriving the mean TTP value from the TTP distributions for the initial and final metrics, displayed in Figure 13.2 below, is relatively straightforward. However the choice of upper and lower percentile percentages and the associated values is not so straight forward. We start by considering the choice of percentile percentages.

The upper percentile percentage

13.163 The choice of percentage for the upper percentile limit needs careful consideration. Setting the percentage too low could result in little or no incentive to improve the long lead times of the complex orders requiring civil construction (i.e. the tail of provisions). Setting the percentage too high could lead to Openreach failing to comply with the targets for reasons genuinely outside its control.

13.164 We examined the distribution of orders by category for 2014 covering all orders and orders exceeding a range of lead times. Our findings are summarised in Table 13.13 below. The table shows that categories 3 and 4 formed a very small proportion of all orders in 2014. It also shows that Category 2 orders dominate the tail of orders displaying very long lead times followed by Category 3 orders. Categories 1 and 4 tend to form a small proportion of the tail.

13.165 Setting the upper percentile percentage to 95% or lower for any lead time within the range of 55 to 238 working days (as used in our analysis presented in Table 13.13 below) could incentivise compliance simply through an improvement of Category 2 orders. Setting the upper percentage percentile to 100% without setting an extremely long lead time would almost certainly produce compliance failure due to factors that may not be entirely under Openreach's control. We therefore believe, on balance, it is appropriate to set the upper percentile percentage approximately mid-way between these two bounds at 97% as a compromise between discouraging performance improvement in some categories at the expense of others and minimising compliance failure outside Openreach's control.

13.166 We recognise that the upper percentile percentage of 97% could still result in no incentive to improve Category 3 orders. We explained earlier that we do not want to apply the minimum standards to specific provision categories because we believe this could interfere with on-going and future changes to the provisioning process. While Category 3 volumes as a proportion of the total were low during 2014, they have been higher in previous years which would increase the incentive to improve their performance. We recognise the proportion could increase or decrease in future years making the category more or less susceptible to performance improvement incentives. We therefore propose to monitor the treatment orders receive through the collection of a range of KPIs to allow us to determine whether specific products, categories or regions are being discriminated against.[316]

[316] Our proposals for KPIs are set out in paragraphs 13.214 *et seq* below.

Table 13.13: Distribution by category of orders exceeding given lead time for 2014 (as proportion of all orders)[317]

Lead time (working days excluding customer caused delay but including all non-customer caused delay)	All categories	Cat 1	Cat 2	Cat 3	Cat 4	Not categorised
All orders	100%	40.0%	47.9%	1.6%	2.5%	8.0%
55	20%	1.4%	15.3%	1.3%	0.4%	1.7%
66	15%	0.8%	11.4%	1.2%	0.3%	1.2%
83	10%	0.4%	7.6%	1.0%	0.2%	0.7%
123	5%	0.2%	3.8%	0.7%	0.1%	0.3%
158	3%	0.1%	2.3%	0.5%	0.1%	0.1%
238	1%	0.0%	0.7%	0.2%	0.0%	0.0%

Source: Ofcom analysis of Openreach section 135 response dated 18 March 2015.

The lower percentile percentage

13.167 The choice of percentage for the lower percentile limit is driven by our recognition of the acceptable and consistent performance of Category 1 orders. The TTP has stayed at about 30 days or less throughout the period 2011 to 2014. We believe improvements in the quality of service performance of other categories should not be at the expense of a decline in Category 1 performance.

13.168 Category 1 orders have formed between approximately 30% and 50% of all orders throughout the period 2011 to 2014, falling to circa 40% in 2014. Performance of the lower 40% of all orders, which are largely Category 1 orders, has not changed significantly during this period as shown by Figure 13.2 below.[318] Consequently our aim with the lower percentile is to incentivise Openreach to maintain the Category 1 performance at a level experienced throughout the period 2011 to 2014.

13.169 We therefore believe it is appropriate to propose a lower percentile percentage of 40% as a reasonable compromise between avoiding undue compliance failure and our desire to incentivise protection of the performance of the lower 40% of provision orders however they may be categorised in DoJ or other future provisioning process.

Choosing the minimum standard parameter values

13.170 Having chosen the upper and lower percentiles, deriving the associated values along with the mean TTP for the initial (2014) and final (2011) metrics from the TTP distributions for 2014 and 2011 respectively, as portrayed in Figure 13.2 below, is relatively straightforward.

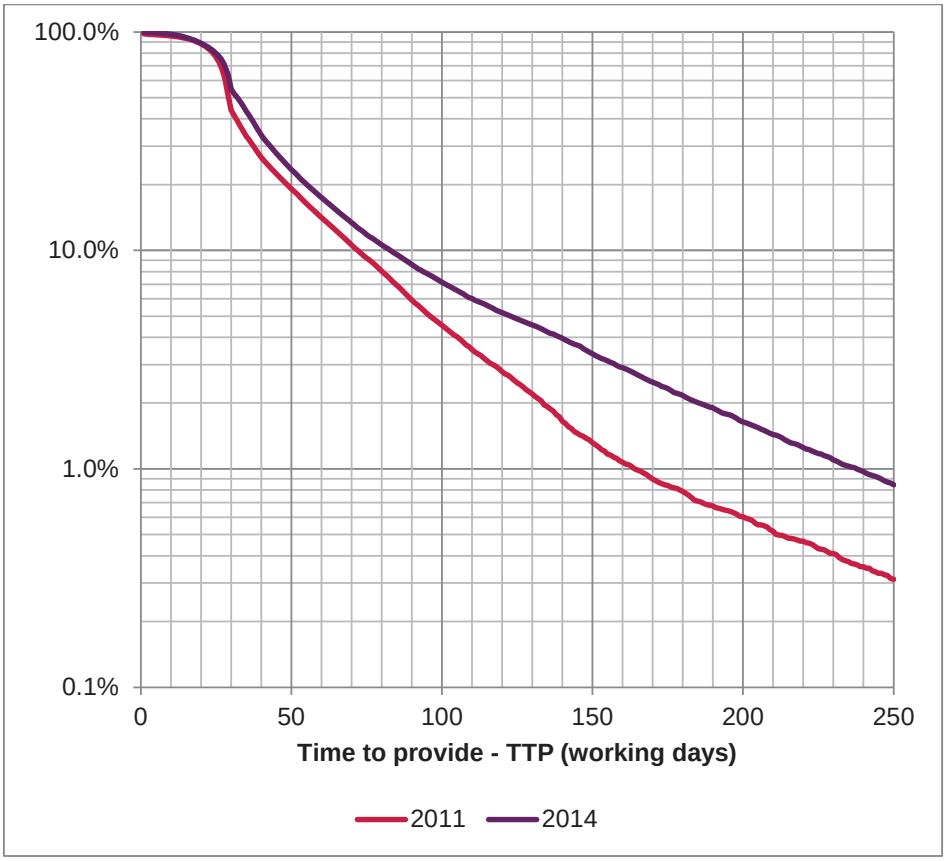
13.171 In conclusion we propose the values set out in Table 13.14 below for the initial and final metrics for the three parameters that we propose to use in specifying a minimum standard for lead times:

[317] Values have been rounded to two significant figures.
[318] The lower 40% of orders corresponds to 60% of orders in the tail in Figure 13.16 where the TTP exceeds approximately 30 days for both 2011 and 2014.

Table 13.14: Initial and final metrics for the lead time minimum standard (excluding customer caused delay)

Parameter	Percentile percentage	Initial metric (2014 performance)	Final metric (2011 performance)
Lower percentile	40%	30 working days	29 working days
Mean TTP	Not applicable	46 working days	40 working days
Upper percentile	97%	159 working days	118 working days

Figure 13.2: Percentage of orders exceeding time to provide (TTP) excluding customer caused delay but including "non-customer" and MBORC event caused delay



Source: Ofcom analysis of Openreach section 135 response dated 18 March 2015.

Question 13.12: Do you agree that it is appropriate to apply limits to mean TTP and upper (97%) and lower (40%) percentiles as the basis for the lead time minimum standard? Please provide reasoning for your answer. If you do not agree, please also give your proposed alternative.

Question 13.13: Do you agree that it is appropriate to set the upper percentile initial and final values to 159 and 118 working days and the lower percentile initial and final values to 30 and 29 working days for the lead time minimum standard to the values?

Please provide reasoning for your answer. If you do not agree, please also give your proposed alternative.

Maintain minimum performance standards on repair

13.172 We have also considered a backstop minimum standard to incentivise continued good performance with the repair of Ethernet services while concentrating on improving provisioning.

13.173 We propose a similar approach to the one we adopted in the 2014 review of fixed access markets, with a minimum standard for repair based on a lower limit of the proportion of repairs that must be completed within the contracted SLA.

13.174 Given that the percentage of faults fixed within 5 hours has varied between 93.1% and 94.4% for the period 2011 to 2014, we considered it appropriate to propose setting the minimum standard at 94% - a slight improvement on 2014 performance and leaving a slight margin with the best performance over the 2011 to 2014 period.

Table 13.15 Proposed minimum standards for fault repair

			New minimum standard		
	2011 performance	**Current performance (2014)**	**Performance over Year 1 (2016/17)**	**Performance over Year 2 (2017/18)**	**Performance over Year 3 (2018/19)**
% faults fixed within 5 hours	93.1%	94.4% (Jan'14 to Jul'14)	At least 94% of faults fixed within 5 hours	As Year 1	As Year 1

13.175 Stakeholder responses to our April 2014 CFI did not raise repair performance as a major concern. We also note that the BDRC Quality of Service Report findings confirm that end-users consider a 5 hour repair time (SLA) for the majority of the Ethernet services to be reasonable whereas longer repair times were considered by the majority to be unreasonable.[319]

13.176 Our analysis also indicated that repair performance over the period 2011 to 2014 was consistently acceptable.

Question 13.14: Do you agree that it is appropriate to set the repair time minimum standard to 94%? Please provide reasoning for your answer. If you do not agree, please also give your proposed alternative.

Impact on Openreach's resources of our quality of service proposals

13.177 In this sub-section we consider the proportionality of the measures we are proposing to remedy our concerns that the poor quality of service offered by BT in the provision and repair of wholesale Ethernet services will impact detrimentally on all downstream providers of leased lines, including BT's retail businesses, and ultimately to the detriment of end-users.

[319] Pp 38-40, BDRC Continental, *Ofcom Quality of Service: Ethernet Leased Lines 2014*, http://stakeholders.ofcom.org.uk/binaries/consultations/bcmr-2015/annexes/QoS_report_27th_April.pdf

13.178 We have already considered the costs of poor quality on Openreach's customers and provisionally consider that the measures we are proposing should significantly reduce these costs.

13.179 Therefore, we now consider the impact of our proposed quality of service minimum standards on Openreach, in particular on its resource levels. Additional resource is usually required to reduce resource utilisation and consequently reduce delay (mean and spread) in queuing systems. We also note from our analysis that demand for Ethernet services has increased over the period 2011 to 2013 and has further shown a significant increase in 2014. Where this increased demand is not addressed by an appropriate level of additional resource, lead time will increase as incomplete orders accumulate thus forming a significant backlog.

13.180 Table 13.16 below extends Table A17.30 in Annex 17 with estimates of the volume of orders not completed each month, the additional resource in KMH required to complete the outstanding orders and the FTE equivalent of the additional resource.[320] It is estimated that between [✂] FTE is required every year over the period 2011 to 2014 to address the incomplete orders.

13.181 We have also investigated the volume of outstanding orders at the end of each year. Table 13.17 below shows two measures of backlog we obtained from Openreach using our formal powers and the FTE resources required to clear the backlog. Our estimates show that between [✂ ✂] FTE are required to address the backlogs.

13.182 Openreach informed us they have recruited [✂] staff (internally and externally) and [✂] contractors to work on fibre products, i.e. NGA and Ethernet. The staff are a mix of field engineering, planning and job control staff, while the contractors are all field engineering staff. We have also been informed by Openreach that they plan to increase staff working on Ethernet products by a further [✂] staff during Q1 and Q2 of 2015/16.[321]

13.183 The additional staff would appear to be sufficient to cover the volume of work not completed every year or alternatively the backlog of work at the end of every year except for 2014 which exhibits a significant jump in order volumes and backlog. However we note that 2014 appears to be an exceptional year for demand compared to the three previous years.[322]

13.184 We are proposing to impose quality of service minimum performance standards that aim to ensure that Openreach achieves the same standard of performance it achieved in 2011. The level of resource needed to complete each individual order in 2014 appears to be very similar to that required in 2011 but higher than in 2012 and 2013. Openreach have increased the level of resource deployed over the period 2011 to 2014 resulting in a corresponding increase in completed orders. However, demand has risen faster than the increase in resource over the same period. This has therefore produced a backlog. Our estimate for the 2014 level of likely outstanding work and the corresponding resource requirement to complete this

[320] We have assumed a conversion ratio of [✂].
[321] Email dated 1 May 2015 from Openreach to Ofcom informing us of changes to Openreach's resourcing plans further to its response 6 February 2015 to Ofcom's 9th leased line charge control section 135 notice dated 2 February 2015.
[322] We also note that eliminating cancelled orders from the demand could save between [✂] FTE in 2011 rising to [✂] FTE in 2014 and a further [✂] FTE in 2014 could be saved if a higher level of efficiency in completing each order is assumed.

outstanding work, takes these factors into account but makes no allowance for any potential efficiency improvements over the same 2011 to 2014 period. We consider that we have made reasonable estimates of the resource required to address 2014 volumes at a performance level equivalent to that achieved in 2011. However we recognise that, in not having assumed any efficiency improvements in our estimates, we may be overstating the additional resource. Clearly further demand increases beyond the levels experienced in 2014 could require additional resource to maintain performance at our proposed minimum standard (i.e. 2011) levels.

13.185 We do not know how many other staff Openreach have available to deploy on Ethernet provision and repair and we do not know how many staff Openreach have deployed on Ethernet provision and repair over the period 2011 to 2014. We have attempted to obtain such information using our formal powers but Openreach have not been able to provide such information explaining in their final response to us on 23 January 2015 (the relevant products being EAD, EAD LA, EBD and Cablelink): "*We have been unable to answer these questions. For the period covered by the questions, delivery of the Relevant Products was part of the responsibilities of the Openreach 'Network Investment' organisation. The issue has been that for the period covered by the questions the Network Investment organisation also had other significant responsibilities including, for example, delivery of BDUK and building the Openreach NGA network. Despite running different lines of enquiry it has not been possible to find a way to accurately isolate resources within the Network Investment organisation that are specific to the Relevant Products*." [323]

13.186 On the basis of the limited evidence we have been able to obtain and our related estimates, it is not clear to us that additional resource to that which we have estimated is required to achieve the minimum standard performance levels we propose to impose on Openreach.

13.187 We will set out our considerations and proposals concerning additional costs due to quality of service in the June 2015 LLCC consultation.

[323] Openreach response, included in their response dated 23 January 2015 to our 8th section 135 notice dated 13 January 2015, to questions 20 to 22 in our 5th section 135 notice dated 24 September 2014.

Table 13.16: Estimate of outstanding work and additional resource required[324]

	Volume accepted orders	Volume completed orders	Total resource expended [✂]	Ratio of resource to completed orders [✂]	Volume orders not completed	Additional KMH required to complete orders not completed	Additional FTE required to complete orders not completed
2011	62220	49941	[✂]	38	12279	[✂]	[✂]
2012	69731	56881	[✂]	35	12850	[✂]	[✂]
2013	78388	59100	[✂]	35	19288	[✂]	[✂]
2014	94716	57820	[✂]	40	36895	[✂]	[✂]

Table 13.17: Actual end of year backlogs and FTE required to clear[325]

	Actual live orders at year end	FTE to clear live orders	Actual workstack at year end	FTE to clear workstack
2011	12104	[✂]	10837	[✂]
2012	12651	[✂]	10810	[✂]
2013	18900	[✂]	15775	[✂]
2014	31372	[✂]	28478	[✂]

Implementation of our quality of service proposals

Introduction

13.188 In this sub-section we set out our proposals for the regulatory instruments and other measures which we consider are appropriate and proportionate to remedy our above concerns regarding the quality of service provided by Openreach to its customers and their end-users.

[324] Values for 2014 prorated to full year from data for January to July using an average of the ratio of the volumes for the first seven months to the volume for the whole year for the years 2011 to 2013.
[325] Values for 2014 prorated to full year from data for January to July using an average of the ratio of the volumes for the first seven months to the volume for the whole year for the years 2011 to 2013.

13.189 We set out:

- a proposed new quality of service SMP services condition (notified at Annex 6), which requires BT, in complying with our proposed network access conditions, to comply with any such quality of service requirements as we may from time to time direct;
- a proposed direction on minimum performance standards (notified at Annex 7), which imposes defined minimum performance standards on BT in the delivery of certain Ethernet services, including the level at which the minimum standards are proposed to be set over each of the three years of the forward looking period of this market review;
- a proposed direction on transparency as to quality of service (notified at Annex 7), which requires BT to provide specified performance metrics;
- a proposed direction relating to service level guarantees (notified at Annex 7), which requires that BT's terms and conditions continue to provide compensation for delays in provisioning and fault repair; and
- proposals for service level agreement and service level guarantee negotiations.

Proposals to impose a new quality of service SMP services condition

Aim and effect of the regulation

13.190 In competitive markets the quality of service of leased lines services would be based on the commercial judgement of individual companies and could be expected to meet the requirements of end-users of the services, as providers would be incentivised to meet customer requirements in order to maximise sales. However, where a provider has SMP, competition cannot be expected to be an effective constraint and the dominant provider would have the ability and incentive to offer inadequate quality of service in order to increase profits.

13.191 In addition, vertically integrated SMP operators have the ability to favour their own downstream business over third party CPs by differentiating on price or terms and conditions. This discrimination can also take the form of variations in quality of service (either in service provision and maintenance or in the quality of network service provided by the dominant provider to external providers compared to its own retail operations). This has the potential to distort competition at the retail level by placing third party CPs at a disadvantage in terms of the services they can offer consumers to compete with the downstream retail business of the vertically integrated operator.

Ofcom's proposals

13.192 Section 87(3) of the Act authorises the setting of SMP services conditions in relation to the provision of network access. Section 87(5) of the Act provides that such conditions may 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 contained in the conditions are complied with within the periods and at the times required by or under the conditions. Section 87(6)(b) further provides that such SMP conditions may also include a condition requiring the dominant provider to publish, in such manner as Ofcom may from time to time direct, all such information as they may direct for the purposes of securing transparency in

relation to such matters. We note Article 12(1) of the Access Directive, which provides that national regulatory authorities may attach to conditions relating to network access obligations covering fairness, reasonableness and timeliness. We consider that the proposed condition will assist in securing that network access is provided within a reasonable period of time.

13.193 The proposed new SMP condition (set and notified in Annex 6) provides for Ofcom to direct BT, subject to the requirements in s49 of the Act that any such directions are objectively justifiable, non-discriminatory, proportionate and transparent, to comply with any such quality of service requirements. We consider that constructing the proposed SMP condition in this manner provides Ofcom with the necessary scope to make, modify or (if appropriate) withdraw directions in relation to the quality of service provided by BT over the course of the three year period of this market review. We consider this to be potentially important, in particular, as we recognise that the practical measures to address quality of service issues which Openreach has been developing with the OTA2 and CPs are, as yet, largely untried, untested and therefore subject to some degree of risk.

13.194 We consider that in proposing this new quality of service SMP services condition, we have, for reasons set out above, had due regard to the principles of, in particular, proportionality and targeted action.

Legal tests

13.195 In proposing this new SMP services condition, we have taken into account the factors set out in section 87(4) of the Act. In particular, we consider that the imposition of a condition which provides for Ofcom to direct BT to comply with such requirements as we consider to be necessary to ensure, amongst other things, an appropriate level of quality of service in the provision of network access so as to secure effective competition in the long term.

13.196 We have considered our duties under section 3 of the Act. We consider that, by ensuring that BT provides such entitlements as we may direct as regards quality of service (in particular the minimum performance standards and transparency of performance metrics we propose below) in relation to the provisioning of Ethernet services and the repair of faults, the condition will further the interests of consumers in relevant markets by promoting competition.

13.197 We have considered the Community requirements set out in section 4 of the Act. We consider that the condition will promote competition in relation to the provision of electronic communications networks and encourage the provision of network access for the purposes of securing efficient and sustainable competition in the markets for electronic communications networks and services.

13.198 We also consider that the condition meets the criteria in section 47(2) of the Act. The condition is:

- objectively justifiable, in that its purpose is to ensure that we can intervene where appropriate to ensure that key services supporting network access are of an acceptable quality of service. The evidence available to us indicates that in the absence of other effective incentive mechanisms further regulation is necessary to secure an appropriate level of service by BT and the condition addresses this issue;

- not unduly discriminatory, as it is proposed only for BT and no other operator has been provisionally found to hold a position of SMP in these markets;

- proportionate, in that we have identified the need for further regulation and the proposed condition enables us to target specifically those areas for which regulation is required but with sufficient flexibility to address future uncertainties. We consider that the condition is the least onerous means of effectively achieving the objective we have identified of securing a minimum level of quality of service in the delivery of key aspects of network access and associated transparency measures to provide for both compliance with the standards and to compliment other interventions to address discriminatory conduct. We have demonstrated that without intervention the level of service by Openreach has fallen below what we consider to be acceptable levels; and

- transparent, in that, in relation to what it is intended to achieve, it is the clear intention of the condition to ensure that we can direct BT to provide a level of assured quality of service in relation to key factors of importance to CPs that buy these wholesale inputs and it is clear what those standards are.

13.199 For the reasons set out above, we consider that the proposed quality of services SMP services condition is appropriate to address the concerns we have about network access, in line with section 87(1) of the Act.

Consistency with the BEREC Common Position

13.200 In making these proposals we have also taken utmost account of the BEREC Common Position.[326] In relation to the objective of achieving a reasonable quality of access products (operational aspects), we have noted above that the BEREC Common Position identifies, among other things, as best practice that NRAs should require SMP operators to provide a defined level of service (BP22) to address the concern that access products may not be of reasonable quality and service levels may not be comparable between that provided to third parties and to the SMP operator's own downstream operations.

Question 13.15: Do you agree with our proposal to set a new SMP services condition which provides for Ofcom to direct BT to comply with all such quality of service requirements in relation to network access provided by BT pursuant to our proposed general and specific network access requirements? If not, please explain why.

Proposals to impose minimum performance standards

Aim and effect of regulation

13.201 In competitive markets the quality of service of leased lines services would be based on the commercial judgement of individual companies and could be expected to meet the requirements of end-users of the services, as providers would be incentivised to meet customer requirements in order to maximise sales. However, where a provider has SMP, competition cannot be expected to be an effective constraint and the

[326] BEREC Common Position onbest practice in remedies imposed as a consequence of a position of Significant Market Power in the relevant markets for wholeale leased lines, BoR (12) 126, http://berec.europa.eu/files/document_register_store/2012/11/BoR_(12)_126_Draft_WLL_CP_2012.11.26.pdf

dominant provider would have the ability and incentive to offer inadequate quality of service in order to increase profitability.

13.202 *Ex ante* regulation may therefore be desirable to specify the quality of service provided by a dominant provider.

Ofcom's proposals

13.203 Section 87(3)(a) of the Act authorises the setting of SMP services conditions which require a dominant provider to give such entitlements as Ofcom may from time direct, as respects the provision of network access to the relevant network. Section 87(5)(b) provides that such conditions may include provision for securing that the obligations contained in the conditions are complied with within the periods and at the times required by or under the conditions. Section 87(6)(b) further provides that such SMP conditions may also include a condition requiring the dominant provider to publish, in such manner as Ofcom may from time to time direct, all such information as they may direct for the purposes of securing transparency in relation to such matters.

13.204 As we have set out above, we propose that BT should be subject to a new requirement to comply with all such quality of service requirements as Ofcom may from time to time direct in relation to network access provided by it pursuant to our proposed conditions requiring BT to provide network access and/or specific forms of network access.

13.205 We further consider that this proposed new SMP services condition provides for us to direct BT, subject to legal tests set out in s45 of the Act which we consider below, to comply with minimum quality of service standards and we believe, for the reasons we have set out in this section, it is appropriate to direct BT to do so.

13.206 With regard to the analysis we have set out earlier in this section detailing how and why we have derived specific minimum standards and the draft direction notified in Annex 7, we propose to direct BT to comply with the following minimum quality of service requirements in the provision of Ethernet services:

i) the orders completed on or before the initial contractual delivery date (CDD) provided to its customers as shown in Table 13.18;

Table 13.18: Proposed minimum standards for orders achieving the initial CDD

		New minimum standard		
	Current performance (2014)	**Performance over Year 1 (2016/17)**	**Performance over Year 2 (2017/18)**	**Performance over Year 3 (2018/19)**
% of orders completed on or before initial CDD	circa 45%	80%	85%	90%

ii) the initial CDDs given by BT to its customers to comply with the proposed time to provide minimum standards in Table 13.19 below (e.g. in Year 1 the initial CDDs which Openreach provides to its customers must, on average for all orders, be no more than 46 working days from order validation etc);

iii) the time taken from order validation to order completion as shown in Table 13.19; and

Table 13.19: Proposed time to provide minimum standards for orders

			New minimum standard (Working days excludes customer caused delays)		
	2011 performance	**Current performance (2014)**	**Performance over Year 1 (2016/17)**	**Performance over Year 2 (2017/18)**	**Performance over Year 3 (2018/19)**
Mean time to provide across orders	40 working days	46 working days	No more than 46 working days	No more than 40 working days	As Year 2
Lower percentile limit	40% of provisions delivered in 29 working days	40% of provisions delivered in 30 working days	At least 40% of provisions delivered in 30 working days or less	At least 40% of provisions delivered in 29 working days or less	As Year 2
Upper percentile limit	3% of provisions delivered in more than 118 working days	3% of provisions delivered in more than 159 working days	No more than 3% of provisions delivered in more than 159 working days	No more than 3% of provisions delivered in more than 118 working days	As Year 2

iv) the faults repaired within the SLA of 5 hours as shown in Table 13.20.

Table 13.20 Proposed minimum standards for fault repair

			New minimum standard		
	2011 performance	**Current performance (2014)**	**Performance over Year 1 (2016/17)**	**Performance over Year 2 (2017/18)**	**Performance over Year 3 (2018/19)**
% faults fixed within 5 hours	93.1%	94.4% (Jan'14 to Jul'14)	At least 94% of faults fixed within 5 hours	As Year 1	As Year 1

Minimum standards should apply annually

13.207 We propose to apply these minimum standards on an annual basis. In proposing annual compliance (rather than a shorter period) we note that:

- Ethernet volumes are relatively low and therefore annual monitoring avoids errors due to small sample sizes;
- The lead times for some orders are necessarily long (e.g where there is extensive network build), and we expect average lead times of over one month, therefore more frequent monitoring may skew results due to ordering cycles and seasonality; and
- Annual measures will be less susceptible to short terms peaks and troughs in demand and resourcing.

Question 13.16: Do you agree that it is appropriate to assess compliance with the proposed minimum standards on an annual basis? If not, please explain why.

Legal tests

13.208 We have set out above our reasons as to why we consider the proposed SMP services condition regarding quality of service meets the relevant tests set out in the Act.

13.209 For the reasons set out above and summarised below, we are further satisfied that the proposed minimum standards direction (as notified and set out in Annex 7) meets the relevant tests set out in the Act.

13.210 We consider that the proposed direction we are making in the wholesale CISBO markets, meets our duties in the Act including our general duties under section 3, and all the Community requirements set out in section 4, of the Act. In particular, the proposed direction is aimed at promoting competition and securing efficient and sustainable competition for the maximum benefit of consumers by ensuring that BT provides a minimum level of performance in key areas of importance to its customers and, having regard to the opinions of consumers in the relevant markets, their end-users.

13.211 Section 49 of the Act requires that we must be satisfied that our proposed directions are objectively justifiable, non-discriminatory, proportionate and transparent. We consider that the minimum standards direction is:

- objectively justifiable, in that it aims to ensure that BT provides its customers with a minimum level of quality of service performance over the market review period which we consider, in light of our provisional review of BT's past performance, is justifiable in terms of a necessary entitlement to access seekers in relation to the provision of network access (in particular addressing Openreach's performance in the speed and certainty in its provision of wholesale Ethernet services to CPs) and also for the purposes of ensuring that Openreach's performance in fault repair remains at acceptable levels;

- not unduly discriminatory, as it is proposed only for BT and no other operator has been provisionally found to hold a position of SMP in these markets;

- proportionate, because it only directs BT to comply with the minimum measures which we consider are required to ensure that it provides at least a minimum level of provisioning and fault repair performance which we consider is reasonable and appropriate in the circumstances; and

- transparent, in that it is clear in its intention that BT is required to provide a level of quality of service above the minimum standards we propose that it is directed to provide.

13.212 For the reasons set out above, we consider that the proposed minimum performance standard direction is appropriate to address the concerns we have identified and in line with section 87 of the Act.

Consistency with the BEREC Common Position

13.213 In making these proposals we have also taken utmost account of the BEREC Common Position.[327] In relation to the objective of achieving a reasonable quality of access products (operational aspects), we have noted above that the BEREC Common Position identifies, among other things, as best practice that NRAs should require SMP operators to provide a defined level of service (BP22) to address the concern that access products may not be of reasonable quality and service levels may not be comparable between that provided to third parties and to the SMP operator's own downstream operations.

Question 13.17: Do you agree with our proposals to direct BT to comply with minimum performance standards for setting initial contractual delivery dates, delivery against initial contractual delivery dates, fault repair performance and overall mean time to provide? If not, please explain why, and set out your proposed alternative.

Proposals regarding transparency as to quality of service

Introduction

13.214 BT is currently subject to a requirement to publish such quality of service information that Ofcom may from time to time direct.[328] This SMP condition was imposed in BCMR 2013 as a general remedy to enable Ofcom to direct BT to publish quality of service information for the purposes of providing transparency of the quality of service provided by BT to its own retail divisions and that provided to other CPs.

13.215 We have set out in Section 8 that we propose not to re-impose this SMP condition.

13.216 In this sub-section, we set out our proposals to direct BT to provide quality of service information in the form of key performance indicators under our proposed new quality of service SMP services condition discussed above. Our proposed KPI Direction provides for transparency of quality of service information for reasons which are not limited to addressing concerns regarding discriminatory conduct.

Aim and effect of the regulation

13.217 In competitive markets the quality of service of leased lines services would be based on the commercial judgement of individual companies and could be expected to meet the requirements of end-users of the services, as providers would be incentivised to meet customer requirements in order to maximise sales. However, where a provider has SMP, competition cannot be expected to be an effective constraint and the dominant provider would have the ability and incentive to offer inadequate quality of service in order to increase profitability.

13.218 In addition, vertically integrated SMP operators have the ability to favour their own downstream business over third party CPs by differentiating on price or terms and conditions. This discrimination can also take the form of variations in quality of service (either in service provision and maintenance or in the quality of network

[327] BEREC Common Position onbest practice in remedies imposed as a consequence of a position of Significant Market Power in the relevant markets for wholeale leased lines, BoR (12) 126, http://berec.europa.eu/files/document_register_store/2012/11/BoR_(12)_126_Draft_WLL_CP_2012.11.26.pdf

[328] BT SMP Condition 8 in BCMR 2013.

service provided by the dominant provider to external providers compared to its own retail operations). This has the potential to distort competition at the retail level by placing third party CPs at a disadvantage in terms of the services they can offer consumers to compete with the downstream retail business of the vertically integrated operator.

13.219 Ex ante regulation may therefore be desirable to provide transparency about the quality of service provided by a dominant provider.

Our proposals

13.220 Section 87(3)(a) of the Act authorises the setting of SMP services conditions which require a dominant provider to give such entitlements as Ofcom may from time direct, as respects the provision of network access to the relevant network. Section 87(5)(b) provides that such conditions may include provision for securing that the obligations contained in the conditions are complied with within the periods and at the times required by or under the conditions. Section 87(6)(b) further provides that such SMP conditions may also include a condition requiring the dominant provider to publish, in such manner as Ofcom may from time to time direct, all such information as they may direct for the purposes of securing transparency in relation to such matters.

13.221 As we have set out above, we propose that BT should be subject to a new requirement to comply with all such quality of service requirements as Ofcom may from time to time direct in relation to network access provided by it pursuant to our proposed conditions requiring BT to provide network access and/or specific forms of network access. In relation to this proposed new condition, we have set out above our proposals to direct BT to comply with minimum quality of service standards.

13.222 We further consider that this proposed new SMP services condition provides for us to also direct BT, subject to legal tests set out in s45 of the Act which we consider below, to publish information about the quality of service of the network access it provides to access seekers.

13.223 We believe there are a number of reasons why, in this review, it is appropriate to direct BT to provide specified performance metrics.

13.224 Firstly, we are proposing to direct BT to comply with minimum performance standards over the course of this forward looking review. There is therefore a requirement for us to monitor BT's compliance with these standards and also provide for transparency of BT's compliance with these measures for both CPs and end users.

13.225 Secondly, we consider that it is also appropriate to monitor and provide visibility of BT's performance in areas which we have not proposed to intervene by imposing ex ante minimum standards but which may nevertheless be of potential concern to us, CPs and/or end users. We set these out in detail below but they include, for example, BT's performance by geographic region so that we can monitor whether BT's response to nationally applied minimum standards delivers performance improvements across all areas of the UK.

13.226 Thirdly, we consider that requiring BT to publish performance metrics by customer furthers our proposed remedies to address concerns regarding discriminatory

conduct and enable CPs to determine whether the service they receive from BT is equivalent to that provided by BT to its own retail divisions.[329]

13.227 In relation to the wholesale market for low bandwidth traditional interface symmetric broadband origination (TISBO) in the UK excluding the Hull area at bandwidths up to and including 8Mbit/s, BT already publishes a set of Key Performance Indicators (KPIs) that have been agreed with industry and the OTA. Given this agreement, we do not consider it necessary to issue a direction specifying the quality of service information that BT should publish in relation to wholesale TI products and services. The new quality of service SMP services condition will therefore function as, amongst other things, a backstop that would allow Ofcom to require BT to publish specific information if satisfactory agreements cannot be reached in future.

13.228 In relation to the wholesale CISBO markets, we are proposing to issue a direction pursuant to this new SMP services condition requiring BT to publish specific quality of service information. The details of the quality of service information we propose to require BT to publish and our reasoning is set out below.

Proposed Key Performance Indicators (KPIs)

13.229 We propose directing BT to provide a comprehensive set of quality of service performance statistics. Of these we propose that BT publish a small set of service KPIs intended to provide transparency to end-users and other interested parties as to the performance achieved by Openreach in terms of key aspects of service delivery – namely, how long it takes for Ethernet services to be installed, delivery date certainty and fault repair performance. These reflect the key service issues identified by end-users in the BDRC Quality of Service Report we commissioned as part of this review.

13.230 Whilst we recognise that Openreach KPIs will not necessarily map on to the actual experience of end-users (as Openreach operates at the wholesale level and the service end-users receive will also reflect the performance of their own retail CP or other parties in the supply chain), we nevertheless consider that they will provide a useful means of making consumers aware of Openreach's underlying performance both nationally and at a regional level. In light of Ofcom regulation which requires Openreach to provide the same product or service to all CPs (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 CPs (including BT) of the same commercial information about such products, services, systems and processes, its performance effects all downstream CPs (whether they are divisions within BT Group or not) equivalently insofar as they consume such wholesale inputs from Openreach. We also note that Openreach already publishes some statistics on its website on its performance in providing and repairing Ethernet services.[330]

13.231 Table 13.21 below, sets out the KPIs we propose are recorded, collated and made available by Openreach to (as identified in the accompanying notes to the table) the public, its customers (the CPs) and to Ofcom on a monthly basis and which we consider are reasonable and necessary in relation to, in particular, compliance monitoring and transparency to complement our proposed measures to address potential discriminatory behaviour. For the avoidance of doubt, where we propose that KPIs are broken down by CP, we propose requiring that BT makes available

[329] Our proposals to address competition concerns concerning price and non-price discrimination are set out in Section 8.
[330] See http://www.homeandwork.openreach.co.uk/Our-responsibilities/

such per CP KPIs to the relevant CP, whereas all KPIs are to be made available to Ofcom.

Table 13.21 Proposed KPIs (see also table notes (i) to (v) below)

KPI Direction	KPI requirement	All Orders (i) (iii)	KPIs split by (ii) (iv)	Num. & den. (v)
KPI (i)	**Average time to provide** Mean Time To Provide (MTTP) excluding customer caused delays of completed orders for each month	Y (P)	R (P) CP	Y*
KPI (ii)	**Fault repair performance** The percentage of registered faults in each month that were fixed within 5 hours	Y (P)	R (P) CP	Y
KPI (iii)	**Delivery date certainty** The percentage of completed orders within each month that are completed by their initial contractual delivery date excluding customer caused delays	Y (P)	R (P) CP	Y
KPI (iv)	**Time To Provide (TTP) lower percentile limit** The percentage of completed orders within each month that are completed by the lower percentile limit excluding customer caused delays	Y (P)	R (P) CP	Y
KPI (v)	**TTP upper percentile limit** The percentage of completed orders within each month that exceed the upper percentile limit excluding customer caused delays	Y (P)	R (P) CP	Y
KPI (vi)	**Initial contractual delivery date MTTP** The mean initial contractual delivery date (CDD) excluding customer caused delays of completed orders for each month	Y	R CP	Y*
KPI (vii)	**Initial CDD lower percentile** The percentage of completed orders within each month where the initial CDD issued for those orders does not exceed the TTP lower percentile limit excluding customer caused delays	Y	R CP	Y
KPI (viii)	**Initial CDD upper percentile** The percentage of completed orders within each month where the initial CDD issued for those orders exceeds the TTP upper percentile limit excluding customer caused delays	Y	R CP	Y
KPI (ix)	**Monitoring the tail** The MTTP excluding customer caused delays for completed orders within each month where the TTP of those orders exceeded the TTP upper percentile limit	Y	R CP PC	Y*

KPI (x)	**Monitoring the tail extremities** The maximum TTP excluding customer caused delays of completed orders within each month	Y	R CP PC	
KPI (xi)	**Order validation** The percentage of completed orders within each month that were validated within the applicable SLA	Y	CP	Y
KPI (xii)	**Performance in issuing initial CDDs** The percentage of completed orders within each month where the initial CDD was issued within the applicable SLA	Y	CP	Y
KPI (xiii)	**Performance against final CDD** The percentage of completed orders within each month that were completed by their final CDD	Y	CP	Y
KPI (xiv)	**Changes to CDDs** The percentage of completed orders within each month that were subject to a CDD excluding customer caused changes	Y	CP	Y
KPI (xv)	**Average number of changes to CDDs** The average number of changes to the CDD after its first issue excluding customer caused changes for completed orders within each month that were subject to a CDD change after the initial CDD was issued.	Y	CP	Y*
KPI (xvi)	**New orders** The volume of orders validated and accepted each month overall, by order category and by CP	Y	CP	
KPI (xvii)	**Orders completed** The volume of orders completed each month	Y	R CP PC	
KPI (xviii)	**Volume of faults** The volume of faults registered on BT OSS during the relevant month	Y	R CP	
KPI (xix)	**Cablelink MTTP** The MTTP excluding customer caused delays of completed Cablelink orders for each month	Y	CP	Y*

Table notes:

i) “Y” means yes, the KPI is required and must be provided. “(P)” adjacent to either Y or R means the KPI for all orders or the regional subset of orders must be published to the public on an Openreach website.

ii) "R" means the KPI must be provided for the eight current general manager field engineer regions[331] used for the delivery of Ethernet services. "CP" means the KPI must be

[331] We refer to an email from Openreach dated 22 April 2015 enclosing a map of the current Ethernet field general manager patches and identifies eight regions: (1) Northern Ireland, (2) North East &

provided for each CPs' orders.[332] "PC" means the KPI must be provided for each of the applicable provision categories.

iii) "All Orders" refers to the total of provision orders for EAD, EAD LA and Cablelink or a specifically defined subset of these for the whole of the UK (i.e. all regions).

iv) For the avoidance of doubt we require one, two or three separate series of values as appropriate when we ask for the KPI values to be split by region, CPs or provision category. We are not requesting a two or three dimensional matrix of values when we ask for the KPI values to be split by two or three of the factors identified by regions, CPs or provision category.

v) Num. and den. mean numerator and denominator respectively. For the *average* values (marked as '*'), we require for each month the numerator representing the sum of the product of the time values (or number of changes) and the quantities of product exhibiting that time values (or number of changes) while for the denominator we require the volume of products over which the average is taken.

Legal tests

13.232 We have set out above our reasons as to why we consider the proposed SMP services condition regarding quality of service meets the relevant tests set out in the Act.

13.233 For the reasons set out below, we are further satisfied that the proposed KPI Direction (as notified and set out in Annex 7) meets the relevant tests set out in the Act.

13.234 We consider that the proposed KPI Direction we are making in the wholesale CISBO market excluding the CLA and Hull area, meets our duties in the Act including our general duties under section 3, and all the Community requirements set out in section 4, of the Act. In particular, the proposed direction is aimed at promoting competition and securing efficient and sustainable competition for the maximum benefit of consumers by ensuring that providers have visibility of the quality of service that BT provides to itself and to other providers. Furthermore and, having regard to the opinions of consumers in the relevant markets, it provides visibility to consumers as regards BT's performance in the provision and maintenance of wholesale Ethernet services upon which they (and their retail providers) in many cases rely.

13.235 Section 49 of the Act requires that we must be satisfied that our proposed directions are objectively justifiable, non-discriminatory, proportionate and transparent. We consider that the KPI Direction is:

- objectively justifiable in that it aims to provide transparency as to the quality of service performance by BT which we consider, in light of our provisional review of the dominant provider's past performance, is justifiable both in terms of a necessary entitlement to access seekers in relation to the provision of network access (in particular Openreach's performance in the speed and certainty in its provision of wholesale Ethernet services to CPs) and for the purposes of ensuring compliance with the minimum standards we are proposing to impose on BT. We also consider that such transparency requirements are justified as a

Scotland, (3) Midlands & North West, (4) Wales, Marches & Northern Home Counties, (5) East of England, (6) London, (7) South East, and (8) South West.

[332] For practical purposes, each CPs' orders should be taken to mean the top nine CPs by order volume and a tenth category aggregating all remaining CPs.

necessary element in our aim of preventing undue discrimination in the provision of service and to ensure that BT offers adequate quality of service by requiring BT to publish quality of service information about the service it provides to itself and to other providers;

- not unduly discriminatory, as it is proposed only for BT and no other operator has been provisionally found to hold a position of SMP in these markets;
- proportionate because it only requires BT to publish the minimum information we consider is required to effectively monitor BT's quality of service performance and comply with the remedies we consider are necessary to impose in relation to minimum standards of performance and non-discriminatory behaviour; and
- transparent in that it is clear in its intention that BT is required to publish quality of service information.

13.236 For the reasons set out above, we consider that the proposed KPI Direction is appropriate to address the concerns we have identified and in line with section 87 of the Act.

The BEREC common position

13.237 In forming these proposals we have also taken utmost account of the BEREC Common Position, in particular the contents of BP24 in relation to the objective of achieving a reasonable quality of access products.[333]

13.238 We therefore consider that our proposals are consistent with the best practice set out in the BEREC Common Position.

Question 13.18: Do you agree with our proposals to direct BT to provide the KPIs we have specified? If not, please explain why, and set out your proposed alternative.

Proposals for a direction relating to service level guarantees (SLGs)

Introduction

13.239 As a consequence of BT's control of wholesale infrastructure in the relevant markets, CPs depend on BT for the provision of wholesale services which are able to support efficient and reliable end-user services. Whilst EOI requirements give BT some incentive to deliver efficient and reliable services to CPs (as its own downstream divisions must also use them), in previous work we have concluded that further measures are required to incentivise good performance.[334]

13.240 In particular, we consider that it is important that the contractual arrangements for the Ethernet products CPs buy from Openreach in the wholesale CISBO markets are such that:

- they incentivise the efficient provision of reliable services to BT's wholesale customers; and

[333] BoR (12) 126.
[334] Ofcom, *Service level guarantees: incentivising performance*, 20 March 2008, http://stakeholders.ofcom.org.uk/binaries/consultations/slg/statement/statement.pdf

- they set out fair and reasonable compensation payments for delays in delivery and repair of such services; and

- they allow BT and its wholesale customers to monitor effectively the performance of BT's provision and repair of wholesale regulated products.

13.241 In order to achieve these objectives, contractual arrangements need to include:

- a set of Service Level Agreements (SLAs) which reflects the commercial SLAs provided to end users of Ethernet leased lines; and

- a set of Service Level Guarantees (SLGs) which sets out fair and reasonable compensations for delays in delivery and repair of such services.

13.242 In support of these objectives, in the 2013 Review we required that BT publish a Reference Offer for its wholesale leased line products which set out its SLAs and SLGs. We also issued a direction under the general network access condition specifying the SLG compensation arrangements for the wholesale Ethernet services BT provides to its customers. The direction applied the principles established in our 2008 SLG work.

Our proposals

13.243 In Section 8 we set out proposals and reasoning for general remedies which form part of the package of measures we propose are required to address the concerns we have provisionally identified in this market review. We propose to re-impose a requirement that BT publish a Reference Offer which, amongst other things, sets out SLAs and SLGs.

13.244 We recognise the ongoing work by Openreach and CPs (facilitated by the OTA2) to make significant changes to the provisioning process for wholesale Ethernet services including future contractual negotiations in respect of associated SLAs/SLGs. We make certain proposals regarding the conduct of such negotiations below, in particular, the adoption of a principle that provision should continue according to the terms of an appropriate, pre-existing SLA/SLG regime until such time as a new SLA/SLG regime can be agreed.

13.245 The existing SLG Direction requires that BT's terms and conditions for the supply of Ethernet services in the wholesale AISBO markets, amongst other things, provide the following:

- pay compensation at 100% of one month's line rental per day up to 60 days for orders not delivered by the Contractual Delivery Date (CDD) or the Customer Requirements Date (whichever is later);

- pay compensation at 15% of one month's line rental per hour up to 200 hours for faults not repaired within 5 hours;

- pay SLG compensation payments proactively; and

- make compensation payments without prejudice to any right of CPs to claim for additional losses.

13.246 In light of the proposals we are making in relation to requirements that BT comply with minimum performance standards, the changes being made to the provisioning

process for Ethernet services, and the likelihood of future contractual negotiations between Openreach and CPs about the SLAs and SLGs which should be applied to these changed processes, we have considered the appropriateness and form of any SLG Direction.

13.247 We remain of the view that, nothwithstanding our proposed interventions to impose minimum standards on BT's quality of service, the requirement for effective contractual SLAs and SLGs remains a necessary and important element to maintaining performance incentives. We would encourage Openreach and CPs to reach agreement over future provisioning SLAs and SLGs for Ethernet services (in particular by adopting the principles and criteria for the conduct of such contractual negotiations discussed below) and, if we are notified by OTA2 that such agreement has been reached, we would consider further (at that time) what response might be necessary and appropriate as regards any SLG Direction in force at that time in accordance with the provisions and procedures detailed in s49 of the Act.

13.248 However, until such time that any new SLAs and SLGs have been agreed or are otherwise resolved by reference to Ofcom (and including any review of the extant SLG Direction as may be necessary as described above) and consistent with the principle that provision should continue according to the terms of an appropriate, pre-existing SLA/SLG until such time as a new SLA/SLG can be agreed, we consider that it remains appropriate to maintain the existing SLG Direction. We therefore propose to re-impose it in the same form as is currently in force, such that BT is required to continue to include the above provisions in its terms and conditions going forward.

Legal tests

13.249 We are satisfied that the proposed SLG Direction (as set out in Annex 7) meets the relevant tests set out in the Act.

13.250 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 conditions are aimed at promoting competition and securing efficient and sustainable competition for the maximum benefits for consumers by the implementation of an SLG regime that will incentivise BT to provide good quality of service to CPs.

13.251 Secondly, section 49 of the Act requires directions to be objectively justifiable, non-discriminatory, proportionate and transparent. The proposed conditions are:

- objectively justifiable, in that it requires BT to adopt an SLG regime that will incentivise it to deliver good quality of services to CPs;
- not unduly discriminatory, as it is proposed only for BT and no other operator has been provisionally found to hold a position of SMP in these markets;
- proportionate, since it only seeks to incentivise good quality of service that would adversely affect competition and ultimately cause detriment to end-users; and
- is transparent, in that the conditions are clear in what they are intended to achieve.

The BEREC common position

13.252 In forming these proposals we have also taken utmost account of the BEREC Common Position, in particular BP23 in relation to the objective of achieving a

reasonable quality of access products.[335] We therefore consider that our proposals are consistent with the best practice set out in the BEREC Common Position.

Question 13.19: Do you agree with our proposals to maintain the existing SLG Direction? If not, please explain why, and set out your proposed alternative.

Proposals for service level agreement (SLA) and service level guarantee (SLG) negotiations

Introduction

13.253 In the course of our last review of fixed access markets, we adopted contract negotiation principles and SLA/SLG assessment criteria to be applied to future industry negotiations in relation to SLAs/SLGs. These formed part of the package of measures we put in place to ensure that BT maintains its quality of service in the supply of Wholesale Line Rental (WLR) and Metallic Path Facility (MPF) services to a sufficiently high level to prevent material detriment to downstream competition in the fixed access markets.[336]

13.254 We believe that the same principles and criteria should also apply to future contract negotiations between Openreach and its customers in relation to SLAs/SLGs for the provision of wholesale Ethernet leased lines and form part of our proposed package of remedies to address the quality of service concerns discussed in this section.

13.255 In this sub-section we:

- Reprise the reasoning for adopting contract negotiation principles and SLA/SLG assessment criteria in our last review of fixed access markets;
- Specify the relevant principles and criteria and related matters which we are proposing should apply to future contract negotiations between Openreach and its customers in relation to SLAs/SLGs for the provision of wholesale Ethernet leased lines; and
- Set out why we consider that it is appropriate to adopt these principles and criteria as part of the package of remedies we are proposing to address our quality of service concerns in this market review.

Reasoning for the adoption of contract negotiation principles and SLA/SLG assessment criteria in our last review of fixed access markets

13.256 In response to concerns raised by CPs about the process for industry negotiations when Openreach or CPs consider that existing terms should be changed or that Openreach should provide new SLAs/SLGs for an element of a service, we recognised that Openreach, as the SMP provider for services in fixed access markets, naturally holds a more powerful negotiating position than other CPs.

[335] BoR (12) 126.
[336] Paragraph 11.394 et seq, Ofcom, *Fixed access market reviews: wholesale local access, wholesale fixed analogue exchange lines, ISDN2 and ISDN30 Volume 1: Statement on the markets, market power determinations and remedies*, 26 June 2014, http://stakeholders.ofcom.org.uk/binaries/telecoms/ga/fixed-access-market-reviews-2014/statement-june-2014/volume1.pdf

13.257 We stated our view that, where all parties are negotiating from a broadly similar position of market power, commercial negotiation without the involvement of the industry regulator is the preferred method for reaching agreement on the terms of SLAs and SLGs.

13.258 In recognition of, in particular, the likely imbalance in negotiating positions as between Openreach and its customers, we explained that we had concerns about the predictability and visibility of the process that determines critical aspects of SLA/SLG terms.

13.259 Whilst maintaining that regulatory intervention should be the last resort, we considered that there should be a defined, structured and open process for the negotiation of SLA/SLG terms which reserved a central role for the OTA2 and set a time limit for negotiations.

Proposed principles for the contract negotiation process and criteria for the assessment of SLA/SLG requests in relation to Ethernet leased line services

13.260 We propose that the principles set out in Table 13.22 and the criteria set out in Table 13.23 should apply to future contract negotiations between Openreach and its customers in relation to SLAs/SLGs for the provision of wholesale Ethernet leased lines.

13.261 These principles and criteria are the same as those set out in the 2014 FAMR Statement and which were amended following consultation with stakeholders in reaching our decisions regarding quality of service remedies in fixed access markets.

Table 13.22: Proposed principles for the contract negotiation process

	Principles
Principle 1	The OTA2 should facilitate all negotiations to create or change an SLA/SLG and that this negotiation will allow input from all affected parties.
Principle 2	The OTA2 will, using stated criteria, assess whether a request for negotiations on a new SLA/SLG or change to an existing SLA/SLG (and related contract terms) should be facilitated through this negotiation process.
Principle 3	No negotiations over the content of an SLA/SLG should extend beyond 6 months, with regular reporting to Ofcom. If, in the opinion of the OTA2, negotiations cannot be successfully concluded or have not been concluded within 6 months, then the OTA2, as part of its final report to Ofcom, will set out its view on whether and on what basis Ofcom should initiate a review.
Principle 4	Provision should continue according to the terms of an appropriate, pre-existing SLA/SLG until such time as a new SLA/SLG can be agreed.

Principles 1 and 2 - The role of the OTA2 and practical application

13.262 We envisage that the OTA2's role will be to facilitate the negotiation process, rather than to make decisions. However, we consider that there is significant scope for the OTA2 to contribute to, as well as guide and structure, the negotiation process and to assist in ensuring that parties are able to fully participate.

13.263 We would expect that the OTA2 would also have a key role in prioritising the issues to be considered in the process. This could mean that the OTA2 would decide that an issue is not appropriate for consideration in the process. This would not, of course,

prevent any stakeholder from raising this issue as a dispute directly with Ofcom, but would ensure that what would be a resource-intensive process is used effectively.

13.264 We propose that the initial criteria used by the OTA2 for making its assessment of SLA/SLG requests under Principle 2 are those set out in Table 13.23 below. While these criteria may need to be adapted over time, we propose that they form a reasonable basis for decisions as to prioritising issues for review.

Table 13.23: Criteria for the assessment of SLA/SLG requests

	Detail
Criterion 1	The request does not duplicate an existing request that is either being considered by the OTA2 or is under discussion within an existing industry forum.
Criterion 2	The request could provide an adequate material benefit for the CP or industry and that any negative impact of the request not being addressed cannot be easily mitigated without the reasonable support of Openreach.
Criterion 3	The request does not seek to address a CP deficiency that should more appropriately be addressed by the CP(s) themselves.
Criterion 4	The request has adequate scale and support across industry or from those CPs addressing a recognised end customer group to which the request relates.

13.265 These above criteria are referenced in our proposed principles.

Principle 3 - Time limits for negotiation and clarifying/amending the subsequent process

13.266 We propose that six months is an appropriate period in which to allow negotiations to take their course, where it is clear they are progressing. However, where negotiations have clearly broken down then the OTA2 need not wait for the full six month period to elapse before providing its report to Ofcom.

13.267 Principle 3 provides that: (i) the OTA2 will be actively reporting to Ofcom on the progress of the negotiations, including setting out its view on whether and on what basis Ofcom should initiate a review; and (ii) after receiving this report, we will consider the matter on its merits. We cannot commit (in the principles) to a full investigation or to invite parties to raise disputes without considering the facts of each specific case first. While we will need to take an independent view of the issues, we will take appropriate account of the OTA2's report, which we expect will include details about the contribution of all participants, including their role in any delays to negotiations.

Principle 4 - clarifying the date when new SLAs/SLGs take effect

13.268 We consider that the 'backdating' of SLAs/SLGs may risk distorting any negotiation process. It could lead to a disproportionate focus on performance in that period and may act to discourage Openreach from engaging positively with the proposed changes, as Openreach would not have an opportunity to modify its behaviour in response to the new targets and penalty payments. We also consider that our principle that "provision should continue according to the terms of an appropriate, pre-existing SLA/SLG until such time as a new SLA/SLG can be agreed" provides sufficient clarity as to the time at which the new SLA/SLG would take effect, i.e. on its agreement.

Proposals regarding negotiating behaviours and references to Ofcom under the proposed principles

13.269 We would expect all parties to any such negotiations (including Openreach) to make all reasonable efforts to exhibit the following behaviours:

- to approach negotiation of these matters with professional courtesy and an openness and willingness to consider the issues raised and any evidence presented;
- to be responsive to requests for negotiation and dialogue in a timely manner;
- to ensure that suitably empowered staff are available for meetings within a reasonable period following a request; and
- to ensure that requests for information are responded to as quickly as reasonably possible.

13.270 If Openreach does not engage in a manner we consider to be appropriate, then we may consider whether there is a need for additional regulatory conditions (to be imposed either as part of future market reviews or at another time) which impose a process for negotiation in such circumstances.

13.271 If an issue is referred to us under these proposed arrangements, we will need to consider what is appropriate, including whether an issue/range of issues warrants our intervention. In addition to considering any such issues under our dispute resolution powers[337], it may also be necessary to consider whether a broader intervention might be required through, for instance, an own initiative compliance investigation or a policy review. Any decision about intervention will be based on our assessment of the issues referred to us in light of our duties and the broader regulatory framework. In the context of any such considerations, we would also consider any advice that the OTA2 offers in its final report, as appropriate.

13.272 In relation to the proposed arrangements, where an issue is referred to us and we consider that it is appropriate to intervene, our starting point will be the respective proposals of each of the parties. In the first instance, we would expect to consider whether it would be appropriate, in light of our duties and the broader regulatory framework, to choose between these proposals, rather than seek to consider other alternative options in detail. This would be intended to create the incentive for parties to set out their most reasonable final positions, rather than taking an extreme position in order to try to distort any eventual regulatory outcome in their favour. However, such an approach remains subject to the overall requirement to adopt an outcome which overall best meets our statutory duties.

Reasoning and timing for the adoption of contract negotiation principles and SLA/SLG assessment criteria in this review

13.273 We consider that the rationale for adopting principles for contract negotiation in the fixed access markets are likely to be applicable here. Faced with the prospect of

[337] We refer to our publication, *Dispute resolution guidelines, Ofcom's guidelines for the handling of regulatory disputes, Guidelines*, 7 June 2011, http://stakeholders.ofcom.org.uk/binaries/consultations/dispute-resolution-guidelines/statement/guidelines.pdf

negotiating contractual terms and SLAs/SLGs to be applied, for example, to new provisioning processes for certain wholesale Ethernet products supplied by Openreach, a similar imbalance in negotiating positions as between Openreach and its customers is, in our view, likely to arise and/or be an issue of concern to CPs. Our findings in this forward looking review of business connectivity markets, provisionally concludes that BT has SMP in the wholesale CISBO markets and, therefore, that CPs will, for the most part, continue to be reliant on Openreach for the supply of wholesale Ethernet services to provide their products and services in downstream markets.

13.274 Furthermore, to the extent that we have received informal feedback from the OTA2, Openreach and some CPs on the conduct of industry negotiations in relation to copper access, we believe that the application of the above principles and criteria has, thus far, has worked well. However we would welcome further comments from relevant stakeholders on this point in their responses to this consultation and the specific question below.

13.275 For these reasons, we have very similar concerns about the predictability and visibility of the process that determines critical aspects of SLA/SLG terms in relation to wholesale Ethernet services as those concerning the supply of WLR and MPF. We therefore consider and propose that the same arrangements should also form part of the whole package of remedies we propose are proportionate and appropriate to ensure that BT maintains its quality of service in the supply of wholesale Ethernet services to a sufficiently high level to prevent material detriment to downstream competition in the relevant markets and, in particular, delivers the outcomes demanded by end-users.

13.276 Whereas the ex ante remedies we have proposed in this section would, subject to consultation and our final decisions, have effect (unless otherwise stated) from the publication of our final Statement in about a year from now, we recognise that contractual negotiations concerning SLAs/SLGs could, and are likely to, commence earlier than this.

13.277 We therefore consider that, in order to have best effect, the above principles for the contract negotiation process and criteria for the assessment of SLA/SLG requests in relation to Ethernet leased line services be adopted and applied in respect of contractual negotiations from this point.

Question 13.20: Do you agree with our proposals regarding the conduct of, and principles and criteria to be applied from now on, to contractual negotiations concerning SLAs/SLGs for the provision of Ethernet services? If not, please explain why, and set out your proposed alternative.

Section 14

Remedies for the Hull area

Introduction

14.1 In this section we set out the SMP remedies we propose to impose on KCOM in the following retail and wholesale markets:

- the retail market for low bandwidth traditional interface (TI) leased lines in the Hull area, at bandwidths up to and including 8Mbit/s;
- the retail market for Contemporary interface (CI) leased lines in the Hull area;
- the wholesale market for low bandwidth Traditional Interface Symmetric Broadband Origination (TISBO) in the Hull area, at bandwidths up to and including 8Mbit/s; and
- the wholesale market for Contemporary Interface Symmetric Broadband Origination (CISBO) in the Hull area.

These proposed SMP remedies are based on the nature of the competition problems we have identified in our analysis, in particular our SMP assessment (as set out in section 6), of these markets. We set out these competition problems in Section 7.

14.2 We consider that these remedies would achieve our statutory duties and would satisfy the relevant legal tests. In formulating these proposals, we have also taken account of our regulatory experience from the two previous market reviews, recent developments in these markets, views expressed by stakeholders in the CFI and expected developments over the course of the review period of three years.

Summary of proposals

14.3 Table 14.1 below summarises the remedies that we propose to impose on KCOM in each of the Hull markets.

Table 14.1: Summary of proposed remedies for KCOM by market

Markets (all in the Hull area)	Proposed remedies
Retail market for low bandwidth TI leased lines Retail market for low bandwidth CI leased lines	– Requirement to supply retail leased lines – Requirement not to discriminate unduly – Requirement to publish a reference offer, including charges, terms and conditions – Cost accounting obligations – Requirement to produce a pricing transparency report
Wholesale market for low bandwidth TISBO Wholesale market for CISBO	– Requirement to provide network access on reasonable request – Requirement not to discriminate unduly – Requirement to publish a reference offer, including charges, terms and conditions – Requirement to notify changes to charges, terms and conditions – Requirement to notify changes to technical information – Requirements for accounting separation – Requirement to produce a pricing transparency report

14.4 In summary, our proposals are to make the following changes to the current package of remedies:

- Amending the requirement to supply retail leased lines by:
  - o removing the obligation to supply new TI leased lines at bandwidths below 2Mbit/s; and
  - o adding a requirement for KCOM to give 2 years' notice to customers before withdrawing any existing services at bandwidths below 2Mbit/s.
- An amendment to the Reference Offer (RO) obligations – both retail and wholesale – to require KCOM to charge its published prices. This would remove the flexibility afforded to KCOM under the present obligation to offer bespoke discounts, but would continue to allow KCOM to offer published discounts.
- The removal of the requirements for KCOM to send Ofcom copies of notifications of changes to technical information.
- An amendment to the requirement for KCOM to publish ROs – both retail and wholesale – and notifications of changes to technical information on its website, to require the information to be publically accessible, i.e. not requiring password access.
- The removal of the requirement for KCOM to include in wholesale ROs and notifications of changes to charges, terms and conditions, the amount applied to each network component with the relevant usage factors for each network

component or combination of such components, reconciled in each case to the charge payable by a CP.

- The addition of retail cost accounting obligations, which will require KCOM to submit to Ofcom financial information on the regulated retail markets.

- The addition of the requirement for KCOM to produce a Pricing Transparency Report for both the retail markets and the wholesale markets in which we are proposing to impose regulation.

- Amending the list of network components that KCOM is required to attribute costs to in its regulated financial statements.

Developments since the 2013 Review and stakeholder comments

14.5 KCOM was the only respondent to the April 2014 CFI to comment about the markets in the Hull area. Below we consider the main points that KCOM raised and other developments since the 2013 Review.

Withdrawal of very low bandwidth TI leased lines

14.6 KCOM advised us in August 2014 that it is developing plans for the withdrawal of its retail very low bandwidth (VLB) TI leased lines (those with bandwidths below 2Mbit/s), with a view to confirming its intentions over the coming months.

Development of competition in the Hull area

14.7 We have observed the following developments since the 2013 Review:

- BT has told us that it has increased its presence in the Hull area by installing a multi-service edge node at its Anson Exchange in the centre of Hull. Once fully operational, this will provide a gateway to BT's retail business services such as IP and Ethernet VPNs and Internet access. Consequently BT will be able to more easily serve business and retail customers in the Hull area, by renting wholesale access circuits from KCOM to connect customer sites to its Anson Exchange. BT has also advised us that it would be willing to provide wholesale terminating segments from outside Hull to locations in the Hull area, using a combination of its own infrastructure and wholesale access circuits from KCOM.

- As noted in Section 6, in the last review we found that MS3 was extending its network in the Hull area. Our analysis in the course of this review suggests that MS3's network has not extended significantly since then and that MS3 supplies very few leased lines – we understand the provision of business broadband services to be MS3's primary focus, rather than leased lines.

- CityFibre has announced that it has completed the first phase of a 62km fibre access network in the Hull area to provide dark fibre to mobile base stations operated by MBNL, the network infrastructure joint venture of EE and Three. CityFibre intends to expand this network to provide services to other industry sectors.[338]

[338] CityFibre press releases 14 November 2014 and 31 March 2015.

- We are aware of a small number of CPs that are seeking to compete for business customers in the Hull area. These CPs currently operate fixed-wireless networks, and they have expressed an interest in competing in the retail leased lines markets using KCOM's wholesale products.

14.8 These developments are relevant to our consideration of remedies as they suggest that during the review period there might be some increase in competitive activity, both at the retail level by CPs using wholesale inputs purchased from KCOM, and at the wholesale level from CPs using their own infrastructure. While any increase is, in our view, unlikely to make these markets competitive in the course of this next review period, we consider these developments are important as they indicate a potential for increased competition in the longer term, something we consider would likely deliver better outcomes for consumers in the Hull area.

14.9 In light of this, we are proposing to amend aspects of the retail and wholesale remedies to ensure that they afford sufficient protection to allow competition to develop. We discuss the proposed amendments in this section.

KCOM's comments

Need for regulation of retail leased lines markets in the Hull area

14.10 KCOM noted that Ofcom had deregulated the narrowband retail market in 2013 and the fixed access retail markets in 2014.[339] In its view the circumstances of retail leased lines are not different enough to all the other retail markets in the Hull area to warrant continued retail SMP regulation.[340] KCOM also noted that:

- retail regulation had been withdrawn in the 2008 Review and in that four-year period when no retail SMP regulation was in place, Ofcom had no cause to launch enforcement action under competition law; and

- Ofcom is considering removing retail regulation for BT's VLB TI retail services, the only remaining retail market in which BT is subject to SMP regulation.

14.11 KCOM said that its own assessment of three criteria test from the EC Recommendation on Relevant markets confirmed their view that SMP regulation of retail leased lines markets in the Hull area is unnecessary.

Specific access obligations

14.12 KCOM cautioned against imposing requirements for KCOM to develop specific wholesale products without demonstrable demand as this would lead to increased retail prices with little benefit to consumers in the Hull area. KCOM supported the use of the obligation to provide network access on reasonable request. In its view this balanced the need to ensure that CPs can obtain network access from KCOM without requiring it to develop wholesale products before requests are received.

[339] Ofcom, *Fixed access market reviews: wholesale local access, wholesale fixed analogue exchange lines, ISDN2 and ISDN30 – Volume 2: LLU and WLR Charge Controls, Statement*, 26 June 2014, http://stakeholders.ofcom.org.uk/telecoms/ga-scheme/specific-conditions-entitlement/market-power/fixed-access-market-reviews-2014/statement/

[340] p5, KCOM, *Business Connectivity Market Review – Call for inputs, KCOM response*, 27 May 2014, http://stakeholders.ofcom.org.uk/binaries/consultations/business-connectivity-market-review/responses/KCOM_Group.pdf

Regulation of legacy TISBO services

14.13 KCOM said that whilst it currently has no specific plans to withdraw any TISBO services, it believed that regulatory obligations to provide all existing TISBO services throughout the next review period are unnecessary as Ethernet services offer a more cost effective option for consumers.

Passive remedies

14.14 In the April 2014 BCMR CFI we explained that we were considering the case for implementing passive remedies. KCOM commented on this by saying that there is little demand for passive access in the Hull area and that it would be disproportionate to impose passive remedies.

Ofcom's comments

Need for regulation of retail leased lines markets in the Hull area

14.15 In relation to the retail leased lines markets in the Hull area, we have set out our SMP assessment and our assessment of the three criteria test in Section 6. As we discuss there in more detail, we consider that it is appropriate to identify two retail leased lines markets in the Hull area, namely the market for TI services at bandwidths up to and including 8Mbit/s and the market for CI services, and to impose *ex ante* regulation.

14.16 As we set out above in Section 6, we propose not to define retail markets for TI services at bandwidths greater than 8Mbit/s. As a result, KCOM will no longer be required to supply these services.

Specific access obligations

14.17 We agree with KCOM that an obligation to provide a specific type of wholesale product is not currently warranted. In the absence of clear demand for a specific type of wholesale product, there is a risk that it would not be used or that it would not meet CPs' requirements. Moreover, we note that KCOM already provides wholesale services to other CPs, including BT, in accordance with its obligation to provide network access on reasonable request. This obligation allows CPs to request wholesale products (and associated interconnection and accommodation facilities) as and when required.

Regulation of legacy TISBO services and the withdrawal of legacy TI services

14.18 We acknowledge that TI services are in long term decline and that at some stage KCOM may wish to withdraw certain services.

14.19 As we have explained in Section 6, we are proposing not to identify retail markets for higher bandwidth TI services. If confirmed, our proposals would mean that *ex ante* regulation for retail TI and wholesale TISBO services at bandwidths above 8Mbit/s would be withdrawn.

14.20 In contrast, in light of our market analysis, we consider that it is appropriate to retain *ex ante* regulation for low bandwidth retail TI and wholesale TISBO services – services at bandwidths up to and including 8Mbit/s.

14.21 The network access obligation that we are proposing for the wholesale low bandwidth TISBO market would require KCOM to provide network access 'on reasonable request' and is in our view sufficiently flexible to accommodate the withdrawal of products by KCOM in response to changing patterns of demand.

14.22 In relation to the low bandwidth retail TI market, as we have discussed above, KCOM is developing plans to withdraw VLB retail services. We consider that these services should be regarded as legacy services that are approaching the end of their life. As such, we consider that it would be inappropriate for us to seek to artificially to extend the availability of these services through *ex ante* regulation. We therefore propose that KCOM should not be required to supply new very low bandwidth retail leased lines from the beginning of the next BCMR period.

14.23 As with the corresponding retail services supplied by BT, our main concern in relation to refusal to supply relates to the withdrawal arrangements, specifically the need to ensure that existing customers are provided with adequate notice of service withdrawal. This is especially important given the critical nature of some of the services that use these VLB leased lines. In light of the fact that KCOM's plans are less developed than BT's, we consider that it is appropriate to retain regulatory oversight of their withdrawal. We also consider it is appropriate to impose a minimum notice period for service withdrawal as a backstop to provide additional assurance to existing customers that sufficient notice will be given for them to migrate critical applications onto alternative services.

14.24 In the BCMR consultation on very low bandwidth leased lines[341] (May 2015 BCMR VLB Consultation) we report that critical national infrastructure (CNI) operators have addressed the technical barriers to migration from VLB services and have made good progress with their plans to migrate from the corresponding VLB retail services provided by BT. We consider that these developments will also reduce the barriers to migration for CNI operators who use KCOM VLB retail services. On balance, a two-year notice period is in our view adequate as a backstop for this purpose and would not interfere with the commercial arrangements that KCOM is developing.

14.25 We therefore propose below that with respect to VLB services, KCOM:

- would not be required to supply new VLB services; and
- would be permitted to withdraw existing VLB services provided that two years' notice is given.

14.26 In the May 2015 BCMR VLB Consultation we set out our plans to mitigate any residual risk to CNI operators by raising awareness of VLB service withdrawal amongst the wider CNI community.

Passive remedies

14.27 As with other types of specific access obligation discussed above, we do not consider it would be appropriate to impose a passive remedy given the lack of demand for passive remedies in the Hull area and the lack of demand for wholesale services more generally.

[341] Ofcom, *Business Connectivity Market Review: Very Low Bandwidth Leased Lines Consultation*, 15 May 2015, http://stakeholders.ofcom.org.uk/consultations/very-low-bandwidth/

Competition problems and approach to remedies

14.28 In Section 7 we have described the competition problems that arise in each of the wholesale leased lines markets that we propose to identify. In particular we explained that in the absence of *ex ante* regulation, the SMP operator would have the incentive, and its SMP would afford it the ability, to engage in a variety of behaviours that would favour their own downstream retail business over rivals in the relevant retail markets, or to maintain some or all prices at an excessively high level or impose a price squeeze. In Section 7 we also explained our general approach to specifying remedies to address these competition problems.

14.29 We begin below by setting out our proposed approach concerning the risk of excessive pricing.

Proposed approach concerning the risk of excessive pricing

Approach taken in the 2013 Review

14.30 In the 2013 Review, rather than impose *ex ante* controls such as a charge control or a cost orientation obligation to address the risk of excessive pricing by KCOM, we decided that a more proportionate approach, which would also have good incentive properties, would be to monitor KCOM's wholesale prices against a suitable benchmark.

14.31 We decided that BT's wholesale prices would provide a suitable initial benchmark for assessing KCOM's retail prices.

14.32 In order to facilitate monitoring of KCOM's wholesale prices we imposed a requirement (as part of the requirement for KCOM to publish a reference offer) for KCOM to publish its maximum wholesale prices.

Aim and effect of approach

14.33 In a competitive market, prices could be expected to be cost reflective. However, where a provider has SMP, competition cannot be expected to provide effective constraints and *ex ante* regulation may be desirable to prevent charges from being set at an excessive level.

14.34 In the wholesale leased lines markets, we propose to find that KCOM has SMP. Whilst there are prospects for competitive entry, we consider that competition will not be sufficiently strong to constrain KCOM in the upcoming review period and we therefore consider that KCOM would have the ability to charge excessive prices to the detriment of end-users.

14.35 The prohibition on undue discrimination and requirement to publish a reference offer only do a limited amount to address the incentive to charge excessive prices and we therefore consider that further measures are needed.

14.36 Whilst in principle a charge control is likely to be effective in controlling KCOM's prices and also would have good incentive properties, we need to consider what is the minimum necessary remedy to achieve the aim pursued, in light of available evidence. In this regard, we note that KCOM has not previously been subject to a charge control in these markets. Furthermore, we have neither received any complaints from customers and competitors, nor have we received responses to the CFI expressing concerns in this regard. We also consider that a charge control could

at this stage produce adverse effects which are disproportionate to the aim that would be pursued by any such control, in particular taking account of the significant costs to Ofcom and KCOM of formulating a charge control.

14.37 We have also considered the alternative of imposing a cost orientation obligation to address the possible risk of excessive pricing. However, we believe that a cost orientation obligation in the present circumstances would be disproportionate for similar reasons discussed above in relation to a charge control. In addition, we consider that such an obligation, if used as the primary control on KCOM's charges, would not address the lack of incentive properties that we think would be required in relation to KCOM for this remedy to be effective.

14.38 We consider that monitoring KCOM's charges against a suitable benchmark would have good incentive properties and will have a lower regulatory burden than *ex ante* controls such as a charge control or cost orientation obligation.

14.39 We consider that this approach has been effective, not least in the wholesale markets,[342] in assisting us in mitigating against the risk of excessive pricing and ensuring reasonable prices in the wholesale markets in the Hull area. We therefore propose to continue this benchmarking approach in this review.

Proposed approach

14.40 If in future we had concerns about the reasonableness of KCOM's wholesale prices, we propose to benchmark them against BT's wholesale prices. Given that the services have the same technical characteristics, we would expect KCOM's wholesale prices to be fairly closely aligned with BT's wholesale prices for broadly comparable charge-controlled products. If we found KCOM's prices to be excessive on that initial analysis, we would then consider what alternative steps might be appropriate to deal with such concerns.

14.41 We consider that BT's wholesale charges are a suitable benchmark because BT's wholesale charges are subject to RPI-X charge controls. The controls are designed amongst other things to drive BT's revenues into line with its forecast costs over the period of the control and to incentivise BT to incur its costs efficiently, with a view to producing an outcome similar to that we might expect from an efficient operator in a hypothetically competitive market. We would expect KCOM's charges in the Hull area to reflect similar outcomes and therefore consider BT's charges to be an appropriate benchmark.

14.42 We acknowledge that KCOM and BT have adopted differing pricing structures for their wholesale leased lines services and may also have differing approaches to recovering their costs (for example, the balance between connection and rental charges). However, we consider that, notwithstanding these differences, a meaningful price comparison can be produced, provided the comparison is constructed so as to assess the overall level of charges for the respective leased line services, rather than to mechanistically compare individual charges.

[342] Following the June 2012 BCMR Consultation, KCOM offered a voluntary commitment to lower its wholesale leased lines prices. Our benchmarking indicated that these reductions would bring KCOM's charges broadly into line with BT's over the next three years.

Assessment of appropriate remedies for the wholesale leased lines markets in Hull

14.43 In this subsection, we set out our proposed remedies to address the identified competition problems in the identified wholesale leased lines markets in the Hull area. Where relevant we explain how we have adapted the broad approach set out in Section 7 to the particular circumstances encountered in the wholesale leased lines markets in the Hull area.

14.44 We assess each proposed remedy in turn by setting out:

- any existing requirements;
- any relevant stakeholder input or recent market developments;
- the aim and effect of the proposed regulation;
- our proposals, including our consideration of relevant stakeholder input; and
- our consideration of the relevant legal tests for the proposed regulation.

14.45 The competition problems and the appropriate remedies are very similar for the wholesale markets for low bandwidth TISBO and CISBO in the Hull area and we therefore consider them together in our assessment below.

Requirement to provide network access on reasonable request

Current remedies

14.46 KCOM is currently required to provide network access on reasonable request and to provide such access as soon as it is reasonably practicable. KCOM must provide this network access on fair and reasonable terms, conditions and charges, or on such other terms, conditions and charges that Ofcom may from time to time direct.

Aim and effect of the regulation

14.47 As we explain in Section 6, we do not consider that CPs other than KCOM (OCPs) have the ability or incentive to duplicate KCOM's network infrastructure in Hull. The costs of developing such an extensive network infrastructure would be very significant, and with KCOM already having developed its extensive infrastructure and having largely sunk the costs of doing so, OCPs would unlikely be able to recover their investment costs. As such, in our view, an obligation requiring KCOM to make access to its network facilities available to OCPs on reasonable request is fundamental to promoting competition in downstream markets. We consider that, in the absence of such a requirement, KCOM would have both the incentive and ability to refuse access at the wholesale level, thereby favouring its own retail operations. This would hinder sustainable competition in the corresponding downstream markets, ultimately against end-users' interests.

14.48 The definition of access and the way in which we might assess reasonable demands for access are set out in our Access Guidelines.[343] We consider it is appropriate in cases where we propose a CP has SMP (such as KCOM in this case) to impose an access obligation on that provider requiring it to meet all reasonable requests for network access within the relevant wholesale market, irrespective of the technology required, on fair and reasonable terms, conditions and charges.

14.49 As we have discussed in paragraph 14.17 above, we consider that imposing requirements for KCOM to provide specific forms of access, in the absence of clear evidence of demand, to be disproportionate and inappropriate at this time. We therefore consider that opportunities for competition are best met by continuing to rely instead on a general obligation for KCOM to provide network access on reasonable request.

Our proposals

14.50 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. Section 87(9) of the Act also authorises SMP services conditions imposing on the dominant provider such rules as they may make in relation to matters connected with the provision of network access about the recovery of cost and cost orientation, subject to the conditions of Section 88 being satisfied.

14.51 We propose to impose an SMP obligation requiring KCOM to provide network access where a third party reasonably requests it in respect of each of the wholesale leased lines markets in the Hull area in which we are proposing to find that KCOM has SMP.

14.52 We consider that the general network access obligation should be supported by an obligation to provide such network access on fair and reasonable terms, conditions and charges, for the following reasons.

14.53 First, we consider that this obligation is needed to complement the non-discrimination obligation and address effectively the risk that KCOM may seek to impose a margin squeeze, or to otherwise act anti-competitively in setting its prices. In this respect, we would not consider that such prices are 'fair and reasonable'. This approach is consistent with the Access Guidelines, which note that:

> "…'fair and reasonable' [would require], amongst other things, that terms and conditions under which products are offered are consistent with those which would be offered in a competitive market, sensible, practical, and do not impose a margin squeeze on competitors."[344]

14.54 In relation to margin (or price) squeeze, the Access Guidelines note, in particular, that a vertically integrated operator may have an incentive to put pressure on competitors by reducing the margin between the wholesale and the retail price to the

[343] Imposing access obligations under the new EU directives, Oftel, 13 September 2002, available at http://www.ofcom.org.uk/static/archive/oftel/publications/ind_guidelines/acce0902.pdf
[344] See paragraph 3.39.

point where it is not sufficient to cover the relevant measure of retail costs.[345] They further note that protection against that type of behaviour may be achieved by imposing a non-discrimination obligation and that charges which created a margin squeeze would not be fair and reasonable. In the light of this, we consider that a fair and reasonable pricing obligation would address our concerns that KCOM could set charges for these wholesale leased lines services in a way that may raise doubt as to whether these charges would be unduly discriminatory, but which pricing behaviour nonetheless amounts to (or has similar effects to) margin squeeze.

14.55 Second, we consider that imposing fair and reasonable pricing obligations would also serve the purpose of providing appropriate protection for other CPs against excessive pricing by KCOM.

14.56 We propose that it is appropriate for this SMP condition to include the power for Ofcom to make directions in order that we can secure the supply of services and, where appropriate, fairness and reasonableness in the terms, conditions and charges for providing third parties with network access. The proposed condition includes a requirement for the dominant provider to comply with any such direction(s), so any contravention of a Direction would constitute a contravention of the condition itself and would therefore be subject to enforcement action under sections 94-104 of the Act.

Legal tests

14.57 For the reasons set out below, we are satisfied that that the proposed condition (as set out in Annex 6) meets the relevant tests set out in the Act.

14.58 When considering the imposition of conditions under Section 87(3) of the Act in a particular case, we must take into account six factors set out in Section 87(4) of the Act, including *inter alia*:

- the technical and economic viability of installing and using other facilities, including the viability of other network access products whether provided by the dominant provider[346] or another person[347], that would make the proposed network access unnecessary;
- the feasibility of the proposed network access;
- the investment made by the person initially providing or making available the network or other facility in respect of which an entitlement to network access is proposed (taking account of any public investment made); and
- the need to secure effective competition, including where it appears to us to be appropriate, economically efficient infrastructure based competition, in the long term.

14.59 In proposing that KCOM should be subject to a requirement to provide network access on reasonable request, we have taken all of the above six factors into account. In particular, having considered the economic viability of building access networks to achieve ubiquitous coverage that would make the provision of network

[345] See paragraph 3.34.
[346] In this instance, KCOM
[347] i.e. other CPs

access unnecessary, we consider that the SMP condition is required to secure effective competition, including economically efficient infrastructure based competition, in the long term in each of the wholesale access markets. The requirements for KCOM to meet only reasonable network access requests also ensure that due account is taken of the feasibility of providing the network access, and of the investment made by KCOM initially in providing the network.

14.60 We are also required to ensure that the condition satisfies the tests set out in section 88 of the Act as the requirement places controls on network access pricing, insofar as charges are required to be fair and reasonable. Section 88(1) of the Act requires that Ofcom must not impose pricing conditions unless it appears from the market analysis carried out for the purpose of setting that condition that there is a relevant risk of adverse effects arising from price distortion. We have discussed above that we consider that, in the absence of price regulation requiring prices to be 'fair and reasonable', KCOM may price excessively.

14.61 Section 88(1)(b) of the Act requires that the pricing condition should be appropriate for the purposes of promoting efficiency, promoting sustainable competition and conferring the greatest possible benefits on the end-users of public electronic communications services.

14.62 We consider that a fair and reasonable charges obligation will prevent KCOM from charging excessively high prices. In this way, this condition supports the aim of improved efficiency. We also consider that the provision of network access on fair and reasonable terms will promote sustainable competition by ensuring that other CPs can effectively compete at the retail level.

14.63 We consider that this proposal meets our duties under sections 3 and all the Community requirements in section 4 of the Act. In particular, in each of the wholesale access markets the condition is aimed at promoting competition and securing efficiency and sustainable competition for the maximum benefit of consumers by facilitating the development of competition in downstream markets.

14.64 Section 47(2) of the Act requires conditions to be objectively justifiable, non-discriminatory, proportionate and transparent. The proposed SMP condition is:

- objectively justifiable, in that it facilitates and encourages access to KCOM's network and therefore promotes competition to the benefit of consumers;
- not unduly discriminatory, as it is proposed only for KCOM and no other CP 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 KCOM holds in these markets and does not require it 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 KCOM provide access to its networks in order to facilitate effective competition.

14.65 For the reasons set out above, we consider that the proposed conditions are appropriate to address the competition concerns identified, in line with section 87(1) of the Act.

The BEREC Common Position

14.66 We have also taken utmost account of the BEREC Common Position,[348] including BP5 and BP36 which appear to us to be particularly relevant in this case.

14.67 We consider that our proposals are consistent with the best practice set out in the BEREC Common Position.

Requirement not to discriminate unduly

Current remedies

14.68 KCOM is currently prohibited from discriminating unduly in relation to the provision of network access.

Aim and effect of the regulation

14.69 Article 8(1) of the 2002 EC Directive on access to, and interconnection of, electronic communications networks and associated facilities (the Access Directive)[349] requires Member States to ensure that national regulatory authorities are empowered to impose certain obligations where an operator is designated as having SMP. These include, under Article 10 of the Access Directive, obligations of non-discrimination. Article 10(1) provides that a national regulatory authority may: "*impose obligations of non-discrimination, in relation to interconnection and/or access*". Article 10(2) further provides:

> "[o]bligations of non-discrimination shall ensure, in particular, that the operator applies equivalent conditions in equivalent circumstances to other undertakings providing equivalent services, and provides services and information to others under the same conditions and of the same quality as it provides for its own services, or those of its subsidiaries or partners".

14.70 Article 10 of the Access Directive is implemented into UK law by section 87(6)(a) of the Act which gives us a power to impose "a condition requiring the dominant provider not to discriminate unduly against particular persons, or against a particular description of persons, in relation to matters connected with network access to the relevant network or with the availability of the relevant facilities". We consider any conditions imposed pursuant to this power require equivalence as per Article 10(2).

14.71 A non-discrimination obligation is intended as a complementary remedy to the network access obligation, principally to prevent the dominant provider from discriminating in favour of its own downstream divisions and to ensure that competing providers are placed in an equivalent position. Without such an obligation, the dominant provider is incentivised to provide the requested wholesale network access service on terms and conditions that discriminate in favour of its own

[348] BoR (12) 126, *BEREC common position on best practice in remedies imposed as a consequence of a position of significant market power in the relevant markets for wholesale leased lines*, 26 November 2012, http://berec.europa.eu/files/document_register_store/2012/11/BoR_(12)_126_Draft_WLL_CP_2012.11.26.pdf.

[349] EC, Directive 2002/19/EC of the European Parliament and of the Council of 7 March 2002 on access to, and interconnection of, electronic communications networks and associated facilities, www.eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2002:108:0007:0020:EN:PDF.

downstream divisions. For example, KCOM may decide to charge its competing providers more than the amount charged to its own downstream units or it might strategically provide the same services but within different delivery timescales. Both these behaviours could have an adverse effect on competition.

14.72 Non-discrimination can have different forms of implementation. A strict form of non-discrimination – i.e. 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 CPs' own downstream divisions) would be provided on a truly equivalent basis, an arrangement which has become known as 'Equivalence of Inputs', or EOI. An EOI obligation removes any degree of discretion accorded to the nature of the conduct. The concept of EOI was first identified in the Strategic Review of Telecoms in 2004/05 as one of our key policy principles to ensure that regulation of the telecommunication markets is effective. Following on from this review, a specific form of EOI was implemented in 2005 by means of the BT Undertakings.

14.73 On the other hand, a less strict implementation of non-discrimination – a no undue discrimination obligation – may allow for flexibility and result in a more practical and cost-effective implementation of wholesale inputs, in cases where it is economically justified. As part of this review, we have considered what form of non-discrimination obligation would be appropriate in each of the wholesale leased lines markets in the Hull area, and our proposal is set out below.

Our proposals

14.74 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.

14.75 We consider that imposing an EOI obligation on KCOM would be disproportionate and unjustified in respect of the scale and competitive conditions in the wholesale leased lines markets in the Hull area. We are therefore proposing to impose an SMP condition prohibiting undue discrimination. This will ensure that there is appropriate non-discrimination protection to remedy the incentive and ability for KCOM to engage in discriminatory pricing and/or non-pricing practices.

Legal tests

14.76 We are satisfied that the proposed conditions (as set out in Annex 6) meet the relevant tests set out in the Act.

14.77 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 preventing KCOM from leveraging its SMP through discriminatory behaviour into downstream markets.

14.78 Section 47 of the Act requires conditions to be objectively justifiable, non-discriminatory, proportionate and transparent. The proposed SMP conditions are:

- objectively justifiable, in that they provide safeguards to ensure that competitors, and hence consumers, are not disadvantaged by KCOM discriminating unduly in favour of its own downstream activities or between different competing providers;
- not unduly discriminatory, in that it is proposed only for KCOM and no other operator has been found to hold a position of SMP in these markets;
- proportionate, in that it only seeks to prevent undue discrimination; and
- transparent, in that the condition is clear in what it is intended to achieve.

14.79 For the reasons set out above, we consider that the proposed conditions are appropriate to address the competition concerns identified, in line with section 87(1) of the Act.

The BEREC Common Position

14.80 We have taken utmost account of the BEREC Common Position,[350] including BP8, BP10 and BP10a which appear to us to be particularly relevant in this case.

14.81 We consider that our proposals are consistent with the best practice set out in the BEREC Common Position.

Transparency and notification obligations

14.82 We propose that KCOM should be subject to a set of obligations designed to promote transparency, reduce the risk of undue discrimination and ensure that CPs are able to make effective use of the dominant providers' network access. The obligations which are discussed in more detail below are:

- a requirement to publish a Reference Offer;
- a requirement to notify of changes to charges, terms and conditions in advance; and
- a requirement to notify of changes to technical information in advance.

Requirement to publish a reference offer

Current remedies

14.83 KCOM is currently required to publish an RO in relation to the provision of network access. The RO must set out (as a minimum) such matters as the terms and conditions for provisioning, technical information, Service Level Agreements (SLAs) and Service Level Guarantees (SLGs), and availability of co-location. This obligation also prohibits KCOM from departing from the terms and conditions set out in the RO, or exceeding the charges set out in the RO. It also requires KCOM to comply with any directions Ofcom may make from time to time under the condition.

Aim and effect of the regulation

14.84 A requirement to publish an RO has three main purposes:

[350] BoR (12) 126, see footnote 348 above.

- to assist transparency for the monitoring of potential anti-competitive behaviour;
- to give visibility to the terms and conditions on which other providers purchase wholesale services; and
- to enable Ofcom to monitor KCOM's wholesale prices (as discussed below).

14.85 This helps to ensure stability in markets as, without it, incentives to invest might be undermined and market entry less likely.

14.86 The publication of an RO would potentially allow for quicker 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.

14.87 Moreover, in conjunction with the non-discrimination obligation, the effect of this obligation is to prevent KCOM from:

- bundling leased lines together with other non-SMP products or services i.e. making the sale of a retail leased line conditional on the sale of another product or service, including as part of a package incorporating another product or service; and
- offering bespoke prices in order to secure business contracts against competition from other CPs. KCOM would still be permitted to offer discounts, but the terms of any such discounts would have to be published in the RO and available to all customers.

Our proposals

14.88 Section 87(6)(c) of the Act authorises the setting of SMP services conditions requiring the dominant provider to publish, in such a manner as Ofcom may direct, the terms and conditions on which it is willing to enter into an access contract. Section 87(6)(d) also permits the setting of SMP services conditions requiring the dominant provider to include specified terms and conditions in 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 form time to time.

14.89 We propose that KCOM should be required to publish an RO for wholesale network access products in each of the wholesale leased lines markets in the Hull area.

14.90 We consider that the requirement to publish ROs imposed in previous markets reviews has been largely effective in meeting the aims of the regulation detailed above. Therefore we consider it appropriate to impose similar obligations on KCOM in this market review.

14.91 The proposed condition requires the publication of an 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.

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

- a clear description of the services on offer, including technical characteristics and operational processes for service establishment, ordering and repair;
- the locations of points of network access and the technical standards for network access;
- conditions for access to ancillary and supplementary services associated with the network access, including operational support systems and databases, etc.;
- contractual terms and conditions, including dispute resolution and contract negotiation/renegotiation arrangements;
- charges, terms and payment procedures;
- SLAs and SLGs; and
- to the extent that KCOM uses the service in a different manner to CPs or uses similar services, KCOM is required to publish an RO in relation to those services.

14.93 We consider that imposing a requirement to publish an RO is necessary to achieve these aims and effects in each of these wholesale markets where we provisionally find KCOM to hold SMP. This remedy complements our proposals to impose network access and non-discrimination requirements on KCOM to address the competition concerns arising from their SMP in each of the wholesale leased lines markets in the Hull area.

14.94 The proposed condition differs from the current condition in the following respects:

14.95 Firstly, in relation to pricing transparency and pricing flexibility, in the 2013 Review we observed that there was relatively little wholesale competition to KCOM. Given this, our view was that the main impact of requiring KCOM not to deviate from published prices would be to restrict its ability to offer discounts to large CPs, and this might lead to higher prices for them. We therefore concluded that KCOM should have some flexibility to price discriminate and offer discounts where it is efficient to do so. We allowed KCOM to offer these bespoke discounts by requiring it to publish only its maximum prices in its reference offer. This was in order to provide some transparency about its wholesale pricing and to allow us to monitor wholesale prices.

14.96 We consider it appropriate to improve pricing transparency and to remove KCOM's flexibility to offer bespoke discounts. This would support the development of competition and minimise the risk of discriminatory conduct by KCOM. We therefore propose to remove the flexibility for KCOM to offer bespoke discounts by requiring it to publish its wholesale charges in its reference offer and not to depart from those charges. KCOM would continue to be allowed to offer discounts, but the terms of these discounts would have to be published in the RO and available to all customers. The proposed condition also includes the following amendments to the condition currently in force:

- We propose removing the requirement on KCOM to include in its RO an amount applied to each network component with the relevant usage factors for each network component or combination of such components, reconciled in each case to the charge payable by a CP. We no longer consider that this information is required in order to assist CPs in monitoring potential discriminatory behaviour by KCOM, or to provide transparency that would allow CPs to make better informed purchasing decisions. This is a change we have already made in other markets,

namely the fixed narrowband services markets[351] and the fixed access markets.[352]

- We propose specifying that KCOM must publish its ROs on *publically available* websites, i.e. those that do not require password access, to ensure full transparency for other CPs and ourselves.

Legal tests

14.97 For the reasons set out below, we are satisfied that the proposed condition (as set out in Annex 6) meets the relevant tests set out in the Act.

14.98 We consider that the proposed condition satisfies our duties under section 3, and all the Community requirements set out in section 4, of the Act.

14.99 The requirement to publish a Reference Offer will, in combination with a requirement not to discriminate unduly, facilitate service interoperability and allow CPs to make informed decisions about future entry into the relevant market. Further, the obligation will enable buyers to adjust their downstream offerings in competition with KCOM in response to changes in KCOM's terms and conditions. Finally, the obligation will make it easier for Ofcom and other CPs in the relevant market to monitor any instances of discrimination. Therefore, we consider that the condition in particular furthers the interests of consumers in relevant markets by the promotion of competition in line with section 3 of the Act.

14.100 We also consider that the condition meets the Community requirements set out in section 4 of the Act. In particular, the condition promotes competition, and encourages the provision of network access and service interoperability for the purpose of securing efficiency and sustainable competition for the maximum benefit for consumers. The publication of an RO will mean that other CPs will have the necessary information readily available.

14.101 Section 47 of the Act 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, provide stability in markets and allow monitoring of anti-competitive behaviour;

- not unduly discriminatory, in that it is proposed only for KCOM and no other operator has been found to hold a position of SMP in these markets;

- proportionate, in that only information that is considered necessary to allow providers to make informed decisions about competing in downstream markets is required to be provided; and

[351] Ofcom, *Review of the fixed narrowband services markets: Statement on the markets, market power determinations and remedies*, 26 September 2013, http://stakeholders.ofcom.org.uk/binaries/consultations/nmr-2013/statement/Final_Statement.pdf, paragraphs 5.480 and 10.229.

[352] Ofcom, *Fixed access market reviews: wholesale local access, wholesale fixed analogue exchange lines, ISDN2 and ISDN30: Volume 1: Statement on the markets, market power determinations and remedies*, 26June 2014, http://stakeholders.ofcom.org.uk/binaries/telecoms/ga/fixed-access-market-reviews-2014/statement-june-2014/volume1.pdf, paragraph 10.250

- transparent, in that it is clear in its intention to ensure that KCOM publishes details of its service offerings.

14.102 Article 9(4) of the Access Directive requires that where network access obligations are imposed, national regulatory authorities shall ensure the publication of an RO containing at least the elements set out in Annex II to that Directive – we are satisfied that this requirement is met.

14.103 For the reasons set out above, we consider that the proposed conditions are appropriate to address the competition concerns identified, in line with section 87(1) of the Act.

The BEREC Common Position

14.104 In forming these proposals we have also taken utmost account of the BEREC Common Position,[353] including BP16, BP16b to BP16d, and BP22 to 23d which appear to us to be particularly relevant in this case.

14.105 We consider that our proposals are consistent with the best practice set out in the BEREC Common Position.

Requirement to notify changes to charges, terms and conditions

Current remedies

14.106 KCOM is currently required to give advanced notice before making changes to their charges or terms and conditions for the provision of existing or new network access in each of the wholesale leased lines markets in the Hull area.

Aim and effect of the regulation

14.107 Notification of changes to charges at the wholesale level has the joint purpose of assisting transparency for the monitoring of potential anti-competitive behaviour, and giving advance warning of charge changes to competing providers who buy wholesale access services. The latter purpose ensures 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. Notification of changes therefore helps to ensure stability in markets, without which incentives to invest might be undermined and market entry made more difficult.

14.108 There may be some disadvantages to notifications, particularly in markets where there is some competition. It can lead to a ‘chilling’ effect where other CPs follow KCOM’s prices rather than act dynamically to set competitive prices. We do not consider, on balance, that this consideration undermines the rationale for imposing a notification of charges condition.

14.109 Each of the wholesale leased lines markets in the Hull area is characterised by a high level of reliance by competitors on the provision of wholesale access products and services to enable them to compete in downstream markets. We therefore consider that the advantages of notifying charges are likely to outweigh any potential disadvantages.

[353] BoR (12) 126, see footnote 348 above.

14.110 In certain circumstances it may also be appropriate to require the notification of changes to terms and conditions, where this will also ensure transparency and provide advanced warning of changes, in order to allow competing providers sufficient time to plan for them. Again, this assists in providing stability in markets, without which incentives to invest might be undermined and market entry made more difficult.

14.111 This remedy complements the network access and non-discrimination requirements on dominant providers to address the competition concerns arising from a position of SMP in the wholesale leased lines markets.

Our proposals

14.112 Section 87(6)(b) of the Act authorises the setting of SMP services conditions which require a dominant provider to publish, in such manner as Ofcom may direct, all such information, for the purpose of securing transparency. Section 87(6)(d) also permits the setting of SMP services conditions requiring the dominant provider to include specified terms and conditions in change notices.

14.113 We propose to impose the obligation on KCOM to notify of changes to its charges, terms and conditions. We refer to these notifications as ‘change notices’. We propose that the following notification periods should apply:

- 28 days’ notice for charges, terms and conditions relating to new service introductions;
- 28 days’ notice for price reductions; and
- 90 days’ notice for all other changes to prices, terms and conditions.

14.114 In deciding to retain these notifications periods, we have considered the following relevant factors:

i) In relation to the 90-day period for changes to existing services, the investment required to use wholesale leased line services is significantly greater and requires CPs to build more complex networks than for most of the services in other markets to which we have applied the same notification requirement with a 28-day notice period.

ii) Wholesale leased line services support multiple downstream services. This means that changes to wholesale leased line services are likely to have a greater impact on CPs than changes to downstream services and will also be more complex to assess. Typically this might involve modelling the impact of the new charges on the cost of providing downstream services, securing internal approval for a pricing revision and notifying end-users (which may be subject to a minimum notice period, typically 28 days).

iii) Too short a notification period would risk that CPs would have insufficient time to react to changes to wholesale terms and could, for instance, be left financially exposed by changes to wholesale prices.

iv) There should be no risk of financial exposure for CPs when prices are reduced, so a 28-day notification period is appropriate.

14.115 In addition, we propose removing the requirement on KCOM to include in its change notices an amount applied to each network component with the relevant usage factors for each network component or combination of such components, reconciled in each case to the charge payable by a CP. We no longer consider that this information is required in order to assist CPs in monitoring potential discriminatory behaviour by KCOM, or to provide transparency that would allow CPs to make better informed purchasing decisions. This is a change we have already made in other markets, namely the fixed narrowband services markets[354] and the fixed access markets.[355]

Legal tests

14.116 For the reasons set out below, we are satisfied that the proposed condition (as set out in Annex 6) meets the relevant tests set out in the Act.

14.117 We considered that the proposed condition satisfies 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. This is achieved by ensuring that CPs are notified in advance about changes to terms, conditions and charges sufficiently in advance to allow them to make informed decisions about competing in downstream markets.

14.118 Section 47 of the Act 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;
- not unduly discriminatory, as it is proposed only for KCOM and no other operator has been found to hold a position of SMP in these 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 would be sufficient for new network access and price reductions; and
- transparent in that it is clear in its intention to ensure that KCOM provides notification of changes to its terms, conditions and charges.

14.119 For the reasons set out above, we consider that the proposed conditions are appropriate to address the competition concerns identified, in line with section 87(1) of the Act.

[354] Ofcom, *Review of the fixed narrowband services markets: Statement on the markets, market power determinations and remedies*, 26 September 2013, http://stakeholders.ofcom.org.uk/binaries/consultations/nmr-2013/statement/Final_Statement.pdf, paragraphs 5.480 and 10.229.

[355] Ofcom, *Fixed access market reviews: wholesale local access, wholesale fixed analogue exchange lines, ISDN2 and ISDN30: Volume 1: Statement on the markets, market power determinations and remedies*, 26June 2014, http://stakeholders.ofcom.org.uk/binaries/telecoms/ga/fixed-access-market-reviews-2014/statement-june-2014/volume1.pdf

Requirement to notify of changes to technical information

Current remedies

14.120 KCOM is currently subject to a requirement to publish, in advance, changes to technical information in each of the wholesale leased lines markets in the Hull area.

Aim and effect of the regulation

14.121 Complementary to the requirement to publish an RO, which includes technical information, the aim of this regulation is to provide advanced notification of changes to technical characteristics. This is to ensure that CPs have sufficient time to respond to changes that may affect them. For example, a CP may need to introduce new equipment, or modify existing equipment or systems, to support a new or changed technical interface. Similarly, a CP may need to make changes to their network in order to support changes in the points of network access or configuration.

14.122 We consider this remedy is important in each of the wholesale leased lines markets to ensure that CPs who compete in downstream markets are able to make effective use of existing or, where applicable, new wholesale services provided by KCOM. Technical information therefore 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).

14.123 The existing condition requires the notification of new technical information within a reasonable period of time, but not less than 90 days in advance of providing new wholesale services or amending existing technical terms and conditions.

14.124 The requirement to give notification within a reasonable time period may mean that a period of notification in excess of 90 days may be appropriate in certain circumstances. For example, if KCOM was to make a major change to its technical terms and conditions, a period of more than the 90-day minimum notification period may be necessary in order to enable competing providers, who purchase affected wholesale services, sufficient time to prepare and support such changes without disruption and detriment to their businesses and customers.

Our proposals

14.125 Section 87(6)(b) of the Act authorises the setting of SMP services conditions which require a dominant provider to publish, in such manner as Ofcom may direct, all such information, for the purpose of securing transparency. Section 87(6)(d) also permits the setting of SMP services conditions requiring the dominant provider to include specified terms and conditions in a notice of changes to technical information.

14.126 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. We consider 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. As noted above, longer periods of notification may also be appropriate in certain circumstances.

14.127 The proposed condition includes two amendments to the condition currently in force. We have removed the requirement for KCOM to additionally send copies of the

notices to Ofcom. We have also added a requirement for KCOM to publish any technical change notice on *publically available* websites, i.e. those that do not require password access, to ensure full transparency for other CPs and ourselves.

Legal tests

14.128 For the reasons set out below, we are satisfied that the proposed condition (as set out in Annex 6) meets the relevant tests set out in the Act.

14.129 We consider that the proposed conditions satisfy 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 ensuring that providers have sufficient notification of technical changes to TISBO and CISBO services to enable them to compete in downstream markets.

14.130 Secondly, section 47 of the Act requires conditions to be objectively justifiable, non-discriminatory, proportionate and transparent. The proposed condition 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 only for KCOM and no other operator has been found to hold a position of 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 KCOM notify changes to technical information in advance.

14.131 For the reasons set out above, we consider that the proposed condition is appropriate to address the competition concerns identified, in line with section 87(1) of the Act.

Requirements for accounting separation

Current remedies

14.132 KCOM is currently subject to accounting separation obligations. These obligations are SMP Conditions OB1 to OB27 and OB31 to OB33, but excluding subparagraphs (a) to (c) and (f) of SMP condition OB23, set out in the July 2004 (KCOM) Notification,[356] but as read in light of the modifications to that Notification set out in paragraph 27 of the 2013 Notification.[357]

Aim and effect of the regulation

14.133 The accounting separation obligations require KCOM to report separately for each of the relevant markets and services, and account separately for internal and external

[356] http://stakeholders.ofcom.org.uk/binaries/consultations/fin_reporting/statement/finance_report.pdf
[357] See Annex 7 of the BCMR 2013 Statement - http://stakeholders.ofcom.org.uk/binaries/consultations/business-connectivity/statement/annexes1-7.pdf

sales, which allows Ofcom and CPs to monitor the activities of KCOM to ensure that it does not discriminate unduly in favour of its own downstream businesses. In practice, this obligation requires KCOM to produce financial statements that reflect the performance of the regulated wholesale markets as though they were separate businesses.

Our proposals

14.134 Sections 87(7) and 87(8) of the Act, authorises Ofcom to impose appropriate accounting separation obligations on a 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.

14.135 We consider that these obligations are necessary to monitor KCOM's activities with regard to its non-discrimination obligations. We therefore propose to impose the same accounting separation obligations that are currently imposed on KCOM in each of the wholesale leased lines markets in which we propose that it has SMP.

14.136 In addition, we propose to amend the list of wholesale network components that KCOM must attribute costs to within its financial reports for each of the wholesale leased lines markets. The current list is included in one of the Directions issued pursuant to these SMP conditions and we propose to add the following list of components to the current list:

- local loop infrastructure;
- exchange to exchange infrastructure;
- electronics;
- field provision;
- field maintenance;
- back-office provision;
- back-office maintenance;
- sales and product management;
- other; and
- net current assets.

Legal tests

14.137 For the reasons set out below, we are satisfied that the proposed condition and the modified direction relating to the network components (as set out in Annexes 6 and 7) meet the various tests set out in the Act.

14.138 We consider that this proposal meets our duties under sections 3 and 4 of the Act. We consider that the imposition of accounting separation obligations promotes competition in relation to the provision of electronic communications networks and

services, ensuring the provision of network access and service interoperability for the purposes of securing efficient and sustainable competition and the maximum benefit for the persons who are customers of CPs. This is because the imposition of the obligation would ensure that other obligations designed to curb potentially damaging leveraging of market power, in particular the requirement not to unduly discriminate, can be effectively monitored and enforced.

14.139 With regard to the Community requirements set out in section 4 of the Act, we believe that the proposed condition meets the requirements. Specifically, we believe section 4(8) is met, where the obligation has the purpose of securing efficient and sustainable competition in the markets for electronic communications networks and services, by helping to ensure that dominant providers comply with other obligations in particular non-discrimination requirements.

14.140 We also consider that this proposal meets Section 47(2) of the Act which requires conditions to be objectively justifiable, non-discriminatory, proportionate and transparent. We consider the proposed condition is:

- objectively justifiable, as it relates to the need to ensure competition develops fairly to the benefit of consumers;
- not unduly discriminatory, as it is only imposed on KCOM, which is the only CP which we propose to find has SMP in the relevant markets in the Hull area;
- proportionate, in that it is the least onerous obligation necessary as a mechanism to allow us and third parties to monitor potentially discriminatory behaviour by KCOM; and
- transparent, in that it is clear that the intention is to monitor compliance with specific remedies and the particular accounting separation requirements of KCOM are clearly documented within the SMP Conditions.

14.141 For the reasons set out above, we consider that the proposed condition is appropriate to address the competition concerns identified, in line with section 87(1) of the Act.

Requirement to produce a pricing transparency report

Aim and effect of the regulation

14.142 In a competitive market, prices could be expected to be cost reflective. However, where a provider has SMP, competition cannot be expected to provide effective constraints and *ex ante* regulation may be desirable to prevent charges from being set at an excessive level. This requirement to produce a Pricing Transparency Report (PTR) and submit it to Ofcom will provide us with transparency in relation to the actual prices that are being paid by customers for wholesale leased lines. This information will enable us to monitor prices against a suitable benchmark and determine whether prices are in excess of reasonable levels (as set out above at paragraphs 14.30 – 14.32).

14.143 Moreover, this PTR would enable us to monitor KCOM's compliance with its other SMP Conditions, such as the obligation to publish a RO and not depart from the charges, terms and conditions set out within it, and the obligation not to discriminate unduly.

Our proposals

14.144 Section 87(6)(b) of the Act authorises the setting of SMP services conditions requiring the dominant provider to publish information for the purpose of securing transparency in relation to matters connected with network access to the relevant network.

14.145 We are proposing to impose an SMP obligation on KCOM requiring it to produce a PTR that would be sent to Ofcom on an annual basis. The PTR would list all the wholesale leased lines that are provided by KCOM (both internal and external sales) that fall within any of the regulated wholesale leased lines markets in the Hull area, accompanied with the following information about each leased line:

a) the product type, interface, bandwidth and circuit orientation;

b) the connection charge paid by the customer;

c) the date on which the current rental charge was agreed; and

d) the amount and frequency of the rental charge paid by the customer.

14.146 We consider that imposing this requirement is necessary to achieve the aim and effect of the regulation in each of the wholesale leased lines markets where we provisionally find KCOM to hold SMP.

Legal tests

14.147 We are satisfied that the proposed SMP condition (as set out in Annex 6) meets the various tests set out in the Act.

14.148 We have had regard for to our duties under section 3, and all the Community requirements set out in section 4, of the Act. We note that the SMP condition is aimed at providing transparency about the prices that KCOM charges to enable us to monitor wholesale charges.

14.149 Section 47 of the Act requires conditions to be objectively justifiable, not unduly discriminatory, proportionate and transparent. The proposed SMP condition is:

- objectively justifiable, in that it enables the monitoring of KCOM's wholesale charges, as well as monitoring KCOM's compliance with the other obligations, specifically the obligation to publish a RO and not to depart from the charges, terms and conditions set out within it, and the obligation not to unduly discriminate;

- not unduly discriminatory, as only KCOM, and no other operator, has been found to hold a position of SMP in these markets and would therefore have the ability and incentive to exploit customers by withholding or misusing information;

- proportionate, since it is targeted at addressing the SMP that we have found KCOM holds in these markets. This obligation supports the other SMP conditions imposed to address KCOM's SMP in this market by providing transparency on retail pricing as a safeguard against excessive pricing, and ensure compliance KCOM's compliance with its other SMP Conditions; and

- transparent, in that the SMP condition is clear in its intention and because the purpose and meaning of the obligation and the reasons for imposing it are clearly explained in this document.

14.150 For the reasons set out above, we consider that the proposed conditions are appropriate to address the competition concerns identified, in line with section 87(1) of the Act.

Interconnection and accommodation remedies

14.151 As noted in Section 6, we do not expect large scale wholesale entry in these markets. Nor has there been any such demand since the commencement of wholesale obligations in the wholesale TISBO market since the 2003/04 Review. Where competition has materialised, we understand that it has done so by relying on KCOM's retail products. Thus the evidence suggests that there is very limited demand, if any, for investments in interconnection facilities and services in the Hull area.

14.152 Interconnection and accommodation services fall within the scope of the network access obligations that we propose for KCOM in these markets.[358] KCOM would be required to meet reasonable requests for interconnection and accommodation services in relation to wholesale services in these markets. We consider this is sufficient to address the identified competition problems identified. Given the lack of demand for interconnection and accommodation services, we do not propose to oblige KCOM to provide specific interconnection or accommodation products at this time.

Approach to retail remedies and competition problems

14.153 We apply regulation at the wholesale level with the aim of addressing our competition concerns both at the wholesale level and at the retail level. However, in circumstances where we consider our wholesale regulation to be insufficient to address our competition concerns in the downstream markets, we also impose retail regulation. Indeed, under section 91(2) of the Act, we may only impose retail remedies where wholesale regulation is insufficient to fully to perform our duties in relation to the market situation in the relevant retail market. Under section 91 of the Act, where wholesale regulation in the upstream market would not suffice to achieve our duties and objectives with regard to the relevant retail market, the sorts of SMP conditions authorised or required by sections 87 to 89 of the Act may be set in that retail market.

14.154 As explained in Section 6, we consider that the remedies imposed in the relevant upstream markets in the Hull area would not fully address the identified competition problems over the period of the review. The effect of this would be that, absent *ex ante* regulation, the SMP provider – in this case KCOM – would have the power to behave to an appreciable extent independently of competitors, customers and ultimately consumers. Moreover, this would be combined with the incentive to

[358] 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.

engage in a variety of behaviours that would distort competition in the relevant retail market or harm consumers, including:

- To unreasonably refuse to supply certain types of service if such a strategy would serve to further its commercial interests.
- To discriminate unduly against particular retail customers or groups of customers by, for instance, varying its prices, terms or quality of service to serve its own commercial interests.
- To charge excessive prices for retail services.

14.155 We therefore consider that KCOM should be subject to a package of measures to prevent it engaging in these behaviours and to assist us in monitoring KCOM's behaviour over the review period.

14.156 We begin below by setting out our proposed approach concerning the risk of excessive pricing.

Proposed approach concerning the risk of excessive pricing

Current approach

14.157 In the 2013 Review, rather than impose *ex ante* controls such as a charge control or a cost orientation obligation to address the risk of excessive pricing by KCOM, we decided that a more proportionate approach, which would also have good incentive properties, would be to monitor KCOM's retail prices against a suitable benchmark.

14.158 We decided that KCOM's wholesale prices (which we also decided to monitor using a benchmark) plus a reasonable allowance for KCOM's gross retail margin (to cover retail costs, including a reasonable rate of return) would provide a suitable initial benchmark for assessing KCOM's retail prices.

14.159 In order to facilitate monitoring of KCOM's retail prices we imposed a requirement (as part of the requirement for KCOM to publish a reference offer) for KCOM to publish its maximum retail prices.

Aim and effect of approach

14.160 In a competitive market, prices could be expected to be cost reflective. However, where a provider has SMP, competition cannot be expected to provide effective constraints and *ex ante* regulation may be desirable to prevent charges from being set at an excessive level.

14.161 In the retail leased lines markets, we propose to find that KCOM has SMP. Whilst there are prospects for competitive entry, we consider that competition will not be sufficiently strong to constrain KCOM in the review period and we therefore consider that KCOM would have the ability to charge excessive prices to the detriment of end-users.

14.162 The prohibition of undue discrimination and requirement to publish a reference offer only do a limited amount to address the incentive to charge excessive prices and we therefore consider that further measures are needed.

14.163 Whilst in principle a charge control is likely to be effective in controlling KCOM's prices, and would also have good incentive properties, we need to consider what is the minimum necessary remedy to achieve the aim pursued, in light of available evidence. In this regard, we note that KCOM has not previously been subject to a charge control in these markets. Furthermore, we have neither received any complaints from customers and competitors, nor have we received responses to the CFI expressing concerns in this regard. We also consider that a charge control could at this stage produce adverse effects which are disproportionate to the aim that would be pursued by any such control, in particular taking account of the significant costs to Ofcom and KCOM of formulating a charge control.

14.164 We have also considered the alternative of imposing a cost orientation obligation to address the possible risk of excessive pricing. However, we believe that a cost orientation obligation in the present circumstances would be disproportionate for similar reasons discussed above in relation to a charge control. In addition, we consider that such an obligation, if used as the primary control on KCOM's charges, would not address the lack of incentive properties that we think would be required in relation to KCOM for this remedy to be effective.

14.165 We consider that monitoring KCOM's charges against a suitable benchmark would have good incentive properties and will have a lower regulatory burden than *ex ante* controls, such as a charge control or cost orientation obligation.

Proposed approach

14.166 As discussed earlier in this section, we consider that BT's wholesale prices provide an initial suitable benchmark against which to assess KCOM's wholesale charges. If we had concerns over retail pricing, we propose that KCOM's wholesale charges plus a reasonable allowance for KCOM's gross retail margin (to cover retail costs, including a reasonable rate of return) would be a suitable benchmark for assessing KCOM's retail prices.[359] If any concerns were raised from this initial analysis, we would then consider what alternative steps might be appropriate to deal with such concerns.

14.167 In order for us to monitor KCOM's retail prices effectively it is important that there is transparency about KCOM's retail prices. In this respect, we consider that the current arrangement, under which KCOM is required to publish only its maximum retail prices, has not been fully effective. KCOM has published very high retail prices and we therefore have insufficient visibility as to the prices actually paid by end-users. In view of this, we consider there is a need for further measures to provide additional transparency about retail pricing, in particular:

- As we discuss in paragraph 14.203 below, we are proposing to remove the flexibility for KCOM to offer bespoke discounts by requiring it to publish its retail charges in its reference offer and not to depart from those charges.

- As we discuss in more detail in paragraphs 14.209 – 14.218 below, we are proposing to require KCOM to provide us with a pricing transparency report annually.

[359] In order to preserve incentives, we may also use BT's retail costs as a benchmark for a reasonable level of retail costs.

Assessment of appropriate remedies for the retail leased lines markets in the Hull area

14.168 In this subsection, we set out our proposed remedies to address the identified competition problems in the retail leased lines markets in the Hull area. In Section 7 we explained our general approach to specifying remedies to address these competition problems. Where relevant we explain below how we have adapted the broad approach set out in Section 7.

14.169 We assess each proposed remedy in turn by setting out:

- any existing requirements;
- any relevant stakeholder input or recent market developments;
- the aim and effect of the proposed regulation;
- our proposals, including our consideration of relevant stakeholder input; and
- our consideration of the relevant legal tests for the proposed regulation.

14.170 The competition problems and the appropriate remedies are very similar in each of the two identified retail markets, and we therefore consider the retail low bandwidth TI market and the retail CI market together in our assessment below.

Requirement to supply retail leased lines

Current remedies

14.171 KCOM is currently required to supply retail leased lines on reasonable request. These leased lines must be provided on fair and reasonable terms, conditions and charges, or such other terms, conditions and charges that Ofcom may from time to time direct. KCOM is also required to comply with any directions Ofcom may make from time to time under the condition.

Aim and effect of the regulation

14.172 In competitive markets retail customers have a choice of suppliers and, if refused service from one provider, would have other suppliers from which they could obtain the same or a similar service. In a market where a provider has SMP, the lack of alternative suppliers creates a risk that the SMP provider could unreasonably refuse to supply certain types of service or customer groups if such a strategy served its commercial interests. An obligation to supply retail leased lines on reasonable request addresses this risk by requiring all services presently offered, as well as all new services, to be supplied upon reasonable request, regardless of any commercial interests.

14.173 Additionally, the obligation requires for services to be provided on fair and reasonable terms, conditions and charges and hence addresses the risk of an SMP provider charging excessive prices.

Our proposals

14.174 Section 91 of the Act authorises the setting of SMP conditions on a dominant provider in a retail market in circumstances where it appears that the imposition of SMP conditions in the upstream wholesale market would not enable us to perform, or fully perform, our duties under section 4 of the Act – in relation to the situation in the retail market as revealed by our analysis of that market. In particular, these duties include: to promote competition in relation to the provision of […] electronic communications services;[360] and to secure efficiency and sustainable competition;[361] and to secure the maximum benefit for the persons who are customers of CPs.[362] As set out above, we consider this test for imposing retail regulation to be satisfied in relation to the retail markets in the Hull area.

14.175 We note that section 87(3) of the Act authorises the setting of an SMP services condition requiring the dominant provider to provide such 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.

14.176 In both of the retail markets in which we have provisionally found that KCOM has SMP, we propose to impose an obligation on KCOM to supply retail leased lines on reasonable request, and to supply them on fair and reasonable terms, conditions and charges, or on terms, conditions or charges that Ofcom may from time to time direct.

14.177 As discussed in paragraph 14.6 above, in view of KCOM's plans to withdraw VLB TI services, we propose that the condition should facilitate the withdrawal of VLB services. In particular we propose:

- not to require KCOM to supply new VLB TI services;
- to require KCOM to supply existing VLB TI services until it gives end-users and Ofcom notice of at least two years' of their withdrawal; and
- require KCOM to comply with directions given by Ofcom in relation to the condition.

Legal tests

14.178 We are satisfied that the proposed conditions (as set out in Annex 6) meet the various tests set out in the Act.

14.179 We have had regard for our duties under section 3, and all the Community requirements set out in section 4, of the Act. We note, in particular, that the proposed condition furthers the interests of citizens and consumers in relation to communications matters by ensuring the availability of retail leased lines services in these markets and by ensuring that VLB services are not withdrawn without sufficient notice.

[360] Communications Act 2003, s4(3)(a)
[361] Communications Act 2003, s4(8)(a)
[362] Communications Act 2003, s4(8)(b)

14.180 Section 47 of the Act requires conditions to be objectively justifiable, not unduly discriminatory, proportionate and transparent. The proposed condition is:

- objectively justifiable, in that, absent this obligation, there is a risk KCOM might unreasonably not supply retail leased lines to some or all end-users;
- not unduly discriminatory, as only KCOM and no other operator has been found to hold a position of SMP in these markets and would therefore have the ability and incentive to exploit customers by not supplying end-users and/or by withdrawing very low bandwidth services without sufficient notice;
- proportionate, since it is the least onerous obligation which addresses these particular risks of harm to end-users and citizens. In particular, wholesale remedies alone would be insufficient because there is little prospect that alternative suppliers would step in using wholesale inputs if such services were withdrawn by KCOM;
- transparent, in that the condition is clear in its intention and because the purpose and meaning of the obligation and the reasons for imposing it are clearly explained in this document.

14.181 For the reasons set out above, we consider that the proposed conditions are appropriate to address the competition concerns identified and ensure end-users derive maximum benefit in terms of choice, price and quality. In this respect, we have also taken into account the extent of investment of KCOM in the matters to which the scope of the fair and reasonable obligation would relate..

Requirement not to discriminate unduly

Current remedies

14.182 KCOM is currently prohibited from discriminating unduly in relation to the provision of retail leased lines.

Aim and effect of the regulation

14.183 In markets where there is an SMP provider and retail competition is weak, the SMP provider has an incentive to distort competition by discriminating against particular groups of retail customers, for example, through charging higher prices where competition is weaker and lower prices where it is stronger. This discrimination can take a number of forms, including price discrimination, imposing unfair terms or offering inadequate quality of service to particular groups of customers. An obligation not to discriminate unduly addresses this risk by prohibiting such conduct to the extent that the discrimination is undue.

Our proposals

14.184 Section 91 of the Act authorises the setting of SMP conditions on a dominant provider in a retail market in circumstances where it appears that the imposition of SMP conditions in the upstream wholesale market would not enable us to perform, or fully perform, our duties under section 4 of the Act – in relation to the situation in the retail market as revealed by our analysis of that market. In particular, these duties include: to promote competition in relation to the provision of […] electronic

communications services;[363] and to secure efficiency and sustainable competition;[364] and to secure the maximum benefit for the persons who are customers of CPs.[365] As set out above, we consider this test for imposing retail regulation to be satisfied in relation to the retail markets in the Hull area.

14.185 We note that 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.

14.186 In light of our analysis in Section 6, particularly in relation to the strength of retail competition in these markets, we propose that KCOM should be subject to a requirement not to discriminate unduly against particular persons or against a particular description of persons in relation to matters connected with the supply of retail leased lines.

Legal tests

14.187 We are satisfied that the proposed SMP condition (as set out in Annex 6) meets the various tests set out in the Act.

14.188 We have had regard to our duties under section 3, and all the Community requirements set out in section 4, of the Act. We note, in particular, that the proposed SMP condition is aimed at preventing the distortion of competition and harm to particular groups of end-users in the form of high prices, unfair terms or inadequate service, which might occur if KCOM had the freedom to unduly discriminate in the provision of services in these markets.

14.189 Section 47 of the Act requires conditions to be objectively justifiable, not unduly discriminatory, proportionate and transparent. The proposed SMP condition is:

- objectively justifiable, in that KCOM would otherwise be able to distort competition by discriminating against particular groups of retail customers – e.g. through charging high prices where competition is weak and lower prices where it is stronger and/or engaging in unduly discriminatory non-pricing practices (such as imposing unfair terms or offering inadequate quality of service to particular groups of customers). The requirement therefore promotes competition and furthers the interests of consumers;

- not unduly discriminatory, as only KCOM, and no other operator, has been found to hold a position of SMP in these markets and would therefore have the ability and incentive to exploit customers by engaging in unduly discriminatory pricing and non-pricing practices;

- proportionate, because it is the least onerous obligation which addresses this particular risk of harm to competition. As noted in relation to the obligation to supply, we do not consider wholesale remedies would be sufficient, because there is little prospect that alternative suppliers would step in using wholesale inputs were KCOM to charge excessive prices, impose unfair terms or offer inadequate quality of service; and

[363] Communications Act 2003, s4(3)(a)
[364] Communications Act 2003, s4(8)(a)
[365] Communications Act 2003, s4(8)(b)

- transparent, in that the SMP condition is clear in its intention and because the purpose and meaning of the obligation and the reasons for imposing it are clearly explained in this document.

14.190 For the reasons set out above, we consider that the proposed conditions are appropriate to address the competition concerns identified and ensure end-users derive maximum benefit in terms of choice, price and quality.

Requirement to publish a reference offer

Current remedies

14.191 KCOM is currently required to publish an RO in relation to the provision of retail leased lines. The RO must set out (at a minimum) such matters as the maximum charges, the terms and conditions of supply and the technical characteristics of the service. This obligation also prohibits KCOM from departing from the charges, terms and conditions set out in the RO. It also requires KCOM to comply with any directions Ofcom may make from time to time under the condition.

Aim and effect of the regulation

14.192 A requirement to publish an RO has three main purposes:

- to assist transparency for the monitoring of potential anti-competitive behaviour;
- to give visibility to the terms and conditions on which other customers will purchase retail services; and
- to enable Ofcom to monitor KCOM's retail prices (as discussed above).

14.193 This helps ensure stability in markets, and without it incentives to invest might be undermined and market entry less likely

14.194 The publication of an RO would potentially allow for quicker negotiations, avoid possible disputes and give confidence to those purchasing retail services that they are being provided on non-discriminatory terms. Without this obligation, KCOM would have an incentive not to publish this information, with the result that discriminatory conduct or excessive pricing would be less visible.

14.195 Moreover, in conjunction with the non-discrimination obligation, the effect of this obligation is to prevent KCOM from:

i) bundling retail leased lines together with other non-SMP products or services i.e. making the sale of a retail leased line conditional on the sale of another product or service including as part of a package incorporating another product or service; and

ii) offering bespoke prices in order to secure business contracts against competition from other CPs. KCOM would still be permitted to offer discounts, but the terms of any such discounts would have to be published in the RO and available to all customers.

Our proposals

14.196 Section 91 of the Act authorises the setting of SMP conditions on a dominant provider in a retail market in circumstances where it appears that the imposition of SMP conditions in the upstream wholesale market would not enable us to perform, or fully perform, our duties under section 4 of the Act – in relation to the situation in the retail market as revealed by our analysis of that market. In particular, these duties include: to promote competition in relation to the provision of […] electronic communications services;[366] and to secure efficiency and sustainable competition;[367] and to secure the maximum benefit for the persons who are customers of CPs.[368] As set out above, we consider this test for imposing retail regulation to be satisfied in relation to the retail markets in the Hull area.

14.197 We note that Section 87(6)(c) of the Act authorises the setting of SMP services conditions requiring the dominant provider to publish, in such a manner as Ofcom may direct, the terms and conditions on which it is willing to enter into an access contract. Section 87(6)(d) also permits the setting of SMP services conditions requiring the dominant provider to include specified terms and conditions in the RO. Finally, section 87(6)(e) permits the setting of SMP services conditions requiring the dominant provider to make such modifications to the reference offer as may be directed form time to time.

14.198 We propose that KCOM should be required to publish an RO for the supply of retail leased lines in each of the retail markets in the Hull area.

14.199 We consider that the current reference offer obligation has been largely effective in meeting the aims of the regulation detailed above, and consider it appropriate to impose a similar obligation on KCOM in this market review.

14.200 The proposed condition requires the publication of an RO, and specifies the information to be included in that RO (set out below) and how the RO should be published. It prohibits KCOM 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 published RO must include as a minimum:

- technical characteristics of the services, including the physical and electrical characteristics, as well as the detailed technical and performance specifications which apply at the network termination point;
- charges, including the initial connection charges, the periodic rental charges and other charges;
- information concerning the ordering procedure;
- contractual details; and
- any refund procedure.

14.201 The proposed condition differs from the current condition in three respects.

[366] Communications Act 2003, s4(3)(a)
[367] Communications Act 2003, s4(8)(a)
[368] Communications Act 2003, s4(8)(b)

14.202 Firstly, in relation to pricing transparency and pricing flexibility, in the 2013 Review we noted there was relatively little competition to KCOM, particularly for large local institutions whose connectivity requirements are mostly within the Hull area. Given this, our view was that the main impact of requiring KCOM not to deviate from published prices would be to restrict its ability to offer discounts to large local users, and this might have led to higher prices for them. We therefore concluded that KCOM should have some flexibility to price discriminate and offer discounts where it is efficient to do so. We allowed KCOM to offer these bespoke discounts by requiring it to publish only its maximum prices in its reference offer. This was in order to provide some transparency of retail pricing and to allow us to monitor retail prices.

14.203 In our view, this arrangement has not been fully effective. KCOM has published very high retail prices and we understand often offers bespoke discounts, consequently providing little transparency about the retail prices that are typically paid by end-users. In light of this, we consider there is a need to improve pricing transparency to enable us to monitor KCOM's retail prices effectively. Also, in view of the better long-term prospects for competition in the Hull area (as discussed in paragraphs 14.7 – 14.8), we consider it appropriate to improve pricing transparency and to remove KCOM's flexibility to offer bespoke discounts. This would support the development of competition and minimise the risk of discriminatory conduct by KCOM. We therefore propose to remove the flexibility for KCOM to offer bespoke discounts by requiring it to publish its retail charges, including any discounts offered, in its reference offer and not to depart from those charges.

14.204 The proposed obligation includes an amendment requiring that KCOM must publish its ROs on *publically available* websites, i.e. those that do not require password access, to ensure full transparency for other CPs and ourselves.

Legal tests

14.205 We are satisfied that the proposed SMP condition (as set out in Annex 6) meets the various tests set out in the Act.

14.206 We have had regard to our duties under section 3, and all the Community requirements set out in section 4, of the Act. We note that the SMP condition is aimed at preventing KCOM from varying terms and conditions in a way which would harm citizens and consumers, and at providing transparency about the prices that KCOM charges to enable us to monitor retail prices.

14.207 Section 47 of the Act requires conditions to be objectively justifiable, not unduly discriminatory, proportionate and transparent. The proposed SMP condition is:

- objectively justifiable, in that it provides certainty to operators and prevents KCOM from withholding information from customers and competitors, or misusing information in a way which could harm competition, which would be a real risk in the absence of the conditions. In addition, the SMP condition facilitates monitoring of KCOM's retail prices and monitoring compliance with the other obligations, notably the obligation not to discriminate unduly;

- not unduly discriminatory, as only KCOM, and no other operator, has been found to hold a position of SMP in these markets and would therefore have the ability and incentive to exploit customers by withholding or misusing information;

- proportionate, since it is targeted at addressing the SMP that we have found KCOM holds in these markets. This obligation supports the other SMP conditions

imposed to address KCOM's SMP in this market. It provides transparency on retail pricing as a safeguard against excessive pricing and it ensures that CPs have access to information they need to compete fairly with KCOM. Additionally, a wholesale remedy would not be capable of supporting the other obligations at the retail level referred to above; and

- transparent, in that the SMP condition is clear in its intention and because the purpose and meaning of the obligation and the reasons for imposing it are clearly explained in this document.

14.208 For the reasons set out above, we consider that the proposed conditions are appropriate to address the competition concerns identified and ensure end-users derive maximum benefit in terms of choice, price and quality.

Requirement to produce a pricing transparency report

Aim and effect of the regulation

14.209 In a competitive market, prices could be expected to be cost reflective. However, where a provider has SMP, competition cannot be expected to provide effective constraints and *ex ante* regulation may be desirable to prevent charges from being set at an excessive level. This requirement to produce a Pricing Transparency Report (PTR) and submit it to Ofcom will provide us with transparency in relation to the actual prices that are being paid by customers for retail leased lines. This information will enable us to monitor prices against a suitable benchmark and determine whether prices are in excess of reasonable levels (as set out above at paragraphs 14.157 – 14.167).

14.210 Moreover, this PTR would enable us to monitor KCOM's compliance with its other SMP Conditions, such as the obligation to publish a RO and not depart from the charges, terms and conditions set out within it, and the obligation not to discriminate unduly.

Our proposals

14.211 Section 91 of the Act authorises the setting of SMP conditions on a dominant provider in a retail market in circumstances where it appears that the imposition of SMP conditions in the upstream wholesale market would not enable us to perform, or fully perform, our duties under section 4 of the Act – in relation to the situation in the retail market as revealed by our analysis of that market. In particular, these duties include: to promote competition in relation to the provision of […] electronic communications services;[369] and to secure efficiency and sustainable competition;[370] and to secure the maximum benefit for the persons who are customers of CPs.[371] As set out above, we consider this test for imposing retail regulation to be satisfied in relation to the retail markets in the Hull area.

14.212 We note that Section 87(6)(b) of the Act authorises the setting of SMP services conditions requiring the dominant provider to publish information for the purpose of securing transparency in relation to matters connected with network access to the relevant network.

[369] Communications Act 2003, s4(3)(a)
[370] Communications Act 2003, s4(8)(a)
[371] Communications Act 2003, s4(8)(b)

14.213 We are proposing to impose an SMP obligation on KCOM requiring it to produce a PTR that would be sent to Ofcom on an annual basis. The PTR would list all the retail leased lines that are provided by KCOM (both internal and external sales) that fall within any of the regulated retail leased lines markets in the Hull area, accompanied with the following information about each leased line:

a) the product type, interface, bandwidth and circuit orientation;

b) the connection charge paid by the customer;

c) the date on which the current rental price was agreed; and

d) the annual rental price paid by the customer.

14.214 We consider that imposing this requirement is necessary to achieve the aim and effect of the regulation in each of the retail leased lines markets where we provisionally find KCOM to hold SMP.

Legal tests

14.215 We are satisfied that the proposed SMP condition (as set out in Annex 6) meets the various tests set out in the Act.

14.216 We have had regard to our duties under section 3, and all the Community requirements set out in section 4, of the Act. We note that the SMP condition is aimed at providing transparency about the prices that KCOM charges to enable us to monitor retail prices.

14.217 Section 47 of the Act requires conditions to be objectively justifiable, not unduly discriminatory, proportionate and transparent. The proposed SMP condition is:

- objectively justifiable, in that it enables the monitoring of KCOM's retail prices, as well as monitoring KCOM's compliance with the other obligations, specifically the obligation to publish an RO and not to depart from the charges, terms and conditions set out within it, and the obligation not to duly discriminate;

- not unduly discriminatory, as only KCOM, and no other operator, has been found to hold a position of SMP in these markets and would therefore have the ability and incentive to exploit customers by withholding or misusing information;

- proportionate, since it is targeted at addressing the SMP that we have found KCOM holds in these markets. This obligation supports the other SMP conditions imposed to address KCOM's SMP in this market by providing transparency on retail pricing as a safeguard against excessive pricing, and ensure KCOM's compliance with its other SMP Conditions; and

- transparent, in that the SMP condition is clear in its intention and because the purpose and meaning of the obligation and the reasons for imposing it are clearly explained in this document.

14.218 For the reasons set out above, we consider that the proposed conditions are appropriate to address the competition concerns identified and ensure end-users derive maximum benefit in terms of choice, price and quality.

Cost accounting obligations

Current remedies

14.219 KCOM is not currently subject to cost accounting obligations in the retail leased lines markets.

Aim and effect of the regulation

14.220 Cost accounting obligations require the dominant provider to maintain a cost accounting system (a set of processes and systems) to capture the costs, revenues, assets and liabilities associated with the provision of services and to attribute them in a fair, objective and transparent manner to individual services in order that the costs of individual services may be determined. Cost accounting obligations perform several important functions. In particular:

- Cost accounting obligations ensure that we have the information necessary to carry out our work, pursuant to our statutory duties, including the following:
  - Information to support the monitoring of compliance with and of effectiveness of remedies. Given the nature of a market review, any SMP findings apply prospectively. In this respect, cost accounting obligations provide important information to us so that we may ensure that remedies we have applied in our market reviews in general, and those SMP conditions we are imposing as a result of this review, continue to address the competition problems identified.
  - Information to support our market reviews. Our market reviews involve a forward-looking, structural evaluation of the relevant markets, based on existing market conditions. The information deriving from cost accounting obligations assists us in this evaluation, in particular, at the remedies stage in determining whether a form of price control[372] (if any) should be imposed and, if so, what the appropriate price control should be.
  - Information to support investigations of potential breaches of SMP obligations and anti-competitive practices. It may also be used in resolving disputes.
- Cost accounting obligations ensure that the dominant provider records all information necessary for the purposes listed above at the time those relevant transactions occur on an ongoing basis. Absent such a requirement, there is a strong possibility that the necessary information would not be available when it is required, and in the necessary form and manner.

Our proposals

14.221 Section 91 of the Act authorises the setting of SMP conditions on a dominant provider in a retail market in circumstances where it appears that the imposition of SMP conditions in the upstream wholesale market would not enable us to perform, or fully perform, our duties under section 4 of the Act – in relation to the situation in the retail market as revealed by our analysis of that market. In particular, these duties include: to promote competition in relation to the provision of […] electronic communications services;[373] and to secure efficiency and sustainable competition;[374]

[372] Within the meaning of section 87(9) of the Act.
[373] Communications Act 2003, s4(3)(a)

and to secure the maximum benefit for the persons who are customers of CPs.[375] As set out above, we consider this test for imposing retail regulation to be satisfied in relation to the retail markets in the Hull area. Furthermore, section 91(6) provides that where Ofcom imposes a condition under section 91 which controls tariffs, or other matters to which costs are relevant, Ofcom may also require the use of a cost accounting system.

14.222 We note that section 87(9) to (11) (subject to section 88) of the Act authorises 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.

14.223 We propose to impose cost accounting requirements on KCOM in both the retail leased lines markets in which we propose that it has SMP. Under this obligation, we would require KCOM to confidentially provide information to Ofcom on an annual basis, showing revenues, wholesale charges and retail costs at a market level for each of the regulated retail markets. Retail costs should be split to show operating expenditure as well as depreciation.

14.224 We consider this additional information is necessary to support our decision-making, including market reviews. In particular, we require the information concerning KCOM's profitability in these retail markets to allow us to monitor the effectiveness of the remedies which we propose to impose on KCOM in both retail leased lines markets where we provisionally find KCOM to hold SMP, including the obligation to provide network access on fair and reasonable terms, conditions and charges.

Legal tests

14.225 We are satisfied that the proposed conditions (as set out in Annex 6) meets the various tests set out in the Act.

14.226 We have had regard to our duties under section 3, and all the Community requirements set out in section 4, of the Act. In accordance with section 3 we consider the proposed conditions would further the interests of citizens and further the interests of consumers in relevant markets by requiring KCOM to provide Ofcom with financial information that would enable us to monitor the effectiveness of the retail remedies we impose and support our decision-making in relation to these markets. Further, for these reasons, in accordance with section 4, we also consider the proposed conditions would help secure the maximum benefit for the persons who are customers of communications providers.

14.227 We consider that the proposed conditions meet the criteria set out in section 47(2) of the Act because they are:

- objectively justifiable, for the reasons set out above;
- non-discriminatory, as they are to be imposed only for KCOM and no other operator has been found to hold a position of SMP in the relevant markets in which we are imposing cost accounting obligations;

[374] Communications Act 2003, s4(8)(a)
[375] Communications Act 2003, s4(8)(b)

- proportionate, in that we propose to require KCOM to provide the minimum amount of information necessary to discharge our duties; and

- transparent, in that these SMP conditions are clear in their intention and because the purpose and meaning of the conditions, and the reasons for imposing them are clearly explained in this document.

14.228 For the reasons set out above, we consider that the proposed conditions are appropriate to address the competition concerns identified and ensure end-users derive maximum benefit in terms of choice, price and quality.

Question 14.1: Do you agree with the remedies that we propose for KCOM in the retail TI and AI markets? If not, what alternative remedies would you propose and why?

Question 14.2: Do you agree with the remedies that we propose for KCOM in the wholesale TISBO and CISBO markets? If not, what alternative remedies would you propose and why?