

# Ofcom's Business Connectivity Market Review Consultation

A DotEcon report for BT

Non-confidential

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# Executive Summary

*Ofcom proposes a dark fibre remedy with 'active minus' pricing.*

Ofcom is proposing to introduce dark fibre remedies in the Contemporary Interface Broadband Origination (CISBO) market in the London Periphery (LP) and in the Rest of UK (RoUK), excluding Hull. Ofcom has chosen to set an 'active-minus' price for dark fibre, based on the prices for a reference product (Ethernet Access Direct (EAD) and EAD Local Access (EAD LA) at 1Gbit/s) minus the "incremental costs attributable to the active service".<sup>1</sup>

We have been asked to consider, at a high-level, the structure of Ofcom's arguments and the analysis provided to support its proposals for the introduction of Dark Fibre (DF) remedies. In this report we consider:

- Ofcom's approach to product and geographic market definition and the assessment of SMP. In particular the failure to identify clusters of competitive supply and the consequences for the introduction of DF access;
- Ofcom's assessment of the risks associated with the introduction of passive remedies and its presumption that they will be limited. In particular, we demonstrate that Ofcom cannot assume that setting the price of DF on an 'active minus' basis relative to a particular benchmark active product (EAD 1Gb/s) is sufficient to mitigate most of the risks.
- Ofcom's assessment of the benefits, and the lack of adequate evidence to support its view that DF will provide benefits over an active only regime; and
- the lack of a clear overall balancing framework to trade-off the risks identified against any benefits and the need for Ofcom to demonstrate that the package of remedies proposed is net-beneficial and presents the best form of intervention to address the competition issues identified.

Ofcom's decision to introduce DF remedies relies strongly on its implicit assumption that, through its approach to pricing for DF, it can mitigate the large majority of the risks associated with introducing such a remedy. It assumes this approach would allow competition on the merits between BT and operators using their own terminal electronics and fault monitoring on BT's fibre.

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<sup>1</sup> For example see paragraph 7.74 of the consultation document.

Ultimately this assumption is critical to Ofcom's conclusions. In essence, Ofcom argues that because the costs and risks of a DF remedy are controllable through EAD-minus pricing, it is sufficient to demonstrate that there *might* be benefits, which primarily arise from innovation possibilities in Ofcom's view. This approach to evaluating the DF remedy falls far short of a careful balancing of costs and benefits.

## Ofcom's pricing approach does not eliminate the risks

*Ofcom assumes that 'EAD-minus' will mitigate costs. However, this oversimplifies the reality*

Ofcom is greatly oversimplifying the extent to which EAD-minus pricing could mitigate risks. There are important differences in this case from the 'textbook' retail-minus pricing rule where appropriate access pricing can open up downstream activities to competition. The capabilities of DF are greater than those provided by the EAD active service used as a reference active product. CPs using DF could provide services at higher bandwidths than the reference active product can provide; they could also provide multiple active services aggregated over a single fibre. This gives rise to larger risks to BT's downstream revenues that are not accounted for in the proposed active-minus pricing approach for which Ofcom has assumed substitution between active and passive services will be one-for-one.

*Ofcom has underestimated the risks of margin erosion*

Margin erosion could arise from aggregation at both higher bandwidths (due to the inherent capability of DF being greater than the reference active product) and lower bandwidths (due to aggregation of active services provided over a DF).

The margin erosion arising from aggregation is more of an issue in those areas where Ofcom has failed to identify high-value clusters of competitively supplied business. Further, the introduction of passive remedies in competitive or prospectively competitive areas could potentially distort the build-buy decisions of OCPs in these areas, undermining investment incentives and the case for full infrastructure competition.

*Costs will be greater the larger the 'minus' and will increase if the reference product remains unchanged in the long-run*

Taking all this into account, there are good reasons why the price for DF access should actually be greater than would be the case under Ofcom's current proposals. The risks will be greater the larger the minus applied by Ofcom in the 'EAD-minus' approach and the lower the resulting price for passive access.

Although Ofcom has made some adjustments to the active pricing regime in the LLCC consultation to allow for circuit cannibalisation, these are also based on an assumption of one-for-one substitution and may not fully account for the lost margins and common cost contributions BT will likely face if DF remedies were introduced.

Further, Ofcom's proposed active-minus approach with a reference product of EAD 1Gbit/s it not future-proof if the specification of active services changes over time or underlying growth in data

shifts demand up to even higher bandwidths. Although Ofcom recognise that it may need to update this in future market reviews, this is unsatisfactory in terms of regulatory certainty, which could dampen the investment incentives of CPs who expect the price to change for better or worse, and limit the benefits on which the introduction of dark fibre has been justified.

## Ofcom needs stronger evidence to demonstrate the benefits

*If risks cannot be reduced to zero, there must be sufficiently certain benefits to justify the introduction of dark fibre*

Ofcom has oversimplified its assessment of the likely scale and scope of the risks and there remains a genuine possibility that many of the risks identified by Ofcom in this and previous consultations will be realised following the introduction of passives. Therefore, in line with its Regulatory Principles Ofcom needs to present sufficient evidence of the benefits to demonstrate that the introduction of passives (or the package of fully specified passive remedies and revised active remedies) would offer the most advantageous solution to the competition problems it has identified.<sup>2</sup>

*Ofcom's assessment of the benefits is based on insufficient evidence of new investments...*

Whereas Ofcom previously required strong evidence of exactly how CPs would use the services and on what and where they would make their investments,<sup>3</sup> in this BCMR, Ofcom seems to accept the 'potential' for innovation possibilities with little concrete evidence,<sup>4</sup> relying on consideration of Openreach's SOR (Statement of Requirement) process and possible innovation on other networks that *might* be provided using the Openreach network if passive remedies were made available.

<sup>2</sup> According to Ofcom's Regulatory principles, "*..interventions will be evidence-based, proportionate, consistent, accountable and transparent in both deliberation and outcome*" <http://www.ofcom.org.uk/about/what-is-ofcom/statutory-duties-and-regulatory-principles/>

<sup>3</sup> For example, in 2013 Ofcom rejected the need to take further regulatory intervention in the form of introducing passive remedies on the basis that, "*... the case for doing so would depend on there being concrete evidence that the transition would lead to a better overall outcome for competition in the market along with evidence that CPs would invest substantially in competition using passive remedies.*" See paragraph 8.131 of Ofcom's 2013 BCMR Statement.

<sup>4</sup> For example at paragraph A23.87 of the consultation document, Ofcom state: "*We do not seek to take a view as to the specific innovations that would occur with passive remedies. Rather, we recognise that in principle access to passive inputs would give CPs the flexibility to differentiate, innovate and upgrade without being dependent on BT... We recognise that a wide range of future innovations may emerge and that passive remedies would allow CPs greater flexibility to develop these faster.*"

*...an assessment of cost savings...*

Whilst Ofcom has attempted to quantify the benefits associated with productive efficiency savings arising from reduced duplication of equipment, it has not adjusted its calculations to account for other costs that may arise such as the costs of alternative methods for monitoring circuits.

*...and uncertain benefit of reduced regulation in future...*

Ofcom has also placed emphasis on benefits associated with being able to reduce or withdraw downstream regulation in future. However, this is undoubtedly a long-term possibility that will only be achieved well beyond the current period of review. It is revealing that Ofcom has included this as a benefit, yet has chosen not to include in its assessment framework the costs of regulating concurrently at multiple levels of the value chain for a long period.

*...but it has not off-set the costs against these benefits*

Ofcom has chosen to propose dark fibre remedies on the basis that there might be some additional benefits over the existing regulatory regime for active services, alongside the chosen pricing approach mitigating the risks associated with introducing actives. However, this does not amount to a clear and transparent framework for considering cost-benefits trade-offs. Ofcom has not shown with any confidence that passives will necessarily be net-beneficial and present the best available form of regulatory intervention for this market.

## Ofcom must present a transparent trade-off framework

The only explicit assessment of the costs and benefits takes place in Ofcom's assessment of the relevant pricing regime for passives in Annex 26 of the consultation document. However, the assessment is entirely qualitative and simply amounts to a comparison of a range of alternative policies with little or no direct assessment of suitability. Ofcom's qualitative assessment simply provides a notional 'score' against each of the possible issues (see tables A26.2 – A26.7) and the summary in Table A26.8 does not show that any particular option is clearly superior from any other.

*Ofcom must demonstrate that the benefits associated with the introduction of dark fibre outweigh the costs*

Choosing to impose dark fibre remedies with active-minus pricing on the basis that from amongst the different options for pricing of passive remedies this provides the best balance of costs and benefits is not sufficient. Suggesting that option X is best overall because there is some option Y that is worse is not enough to demonstrate an optimal, proportionate choice of policy. In line with its Regulatory Principles, Ofcom must also demonstrate that the preferred passives option will necessarily lead to better outcomes than a regime of regulating actives only and is the least intrusive regulatory mechanisms to achieve its policy objectives. The relevant counterfactual when considering the introduction of dark fibre should be a well-designed system of regulation for an appropriate range of active access products, and many of the arguments advanced in favour of passives could be addressed

through less intrusive modifications of the current regulatory structure for active services.

*Ofcom must show the package of remedies is net-beneficial*

For Ofcom to validate the introduction of passive remedies, a sufficiently certain net benefit is required to justify their adoption. It is important that Ofcom quantify the costs and benefits where possible and provide sufficient transparency in argumentation as possible to show that, were it to decide to introduce passive remedies, doing so would be net-welfare enhancing.

## A precautionary approach may be justified

If passives were introduced, they would be difficult to unwind, and there remains some uncertainty about the exact scale and scope of the costs and benefits and the time period over which they will be realised. Given the potentially significant costs, the uncertainty of the benefits and the irreversibility of any decision to introduce passive remedies, precaution and proportionality are very important. It would be entirely appropriate for Ofcom to adopt a precautionary principle in that expected benefits would need to exceed expected costs to a sufficient extent for introduction of passives to be justified.<sup>5</sup>

This reflects the lost option value associated with crystallising a decision to introduce passives, in that the possibility of waiting and making a decision at a later time with better information is then foregone. Furthermore, measures to de-risk any decision need to be considered, in terms of phasing change and considering staging posts along the way, rather than directly facing the unmitigated risk of a possibly dislocating change that is difficult to reverse.

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<sup>5</sup> There has been significant debate about the implications of irreversible decisions in the context of public policy towards technological developments (e.g. introducing genetically modified crops). See for example UNESCO, "The Precautionary Principle", 2005 available at <http://unesdoc.unesco.org/images/0013/001395/139578e.pdf>

## Ofcom must demonstrate that passive remedies will solve specific competition issues it has identified in a clearly defined market

*Remedies should be assessed in the context of a well-defined market and clear competition issues*

Ultimately, any need for passive remedies must derive from a demonstrated lack of effective competition within a properly defined relevant market. The analysis of passive remedies should start not with the question of ‘what could passives do?’ but rather with that of ‘what problem is being solved?’. Ofcom must justify the need for the introduction of passive remedies by defining the product and geographic scope of the business connectivity market, identifying SMP and then demonstrating that passive remedies are proportionate and present the most appropriate form of regulatory intervention.

Ofcom’s approach to market definition provides an inaccurate view of the level of competition in the market and, as a result, has major consequences for its decision to impose dark fibre remedies in all areas other than the Central London Area.

*However, Ofcom’s market definition is flawed...*

The approach Ofcom has taken to defining both the product and the geographic market does not fully account for the interaction between product characteristics and location and its assessment leads to a number of cumulating biases against the higher bandwidth services.

*...and this has consequences for its assessment of competition*

As a consequence of its approach Ofcom has failed to identify clusters of demand in areas where there is a strong probability of prospective competition from other infrastructure providers, and the introduction of DF in these areas could undermine incentives for full infrastructure competition. Further, given the ability to aggregate service over one fibre (multiplexing and aggregation), it is entirely likely that should dark fibre become available in these areas OCPs will use DF to provide multiple services over a single fibre (even at bandwidths below 1Gbit/s). This demonstrates the consequences of failing to consider the full scope for variation of competition conditions with both product characteristics and location. This has further implications for the assessment of BT’s lost margins and circuit cannibalisation calculations, and the proposed pricing regime does not take this into account, thus undermining the validity of Ofcom’s decision to impose passive remedies.

# 1 Introduction and terms of reference

We have been asked by BT to consider Ofcom's Business Connectivity Market Review ("BCMR") consultation of 15 May 2015 with a focus on the proposals to introduce passive remedies in the form of dark fibre.<sup>6</sup>

We have been asked to consider, at a high-level, the structure of Ofcom's arguments and the evidence provided to support its proposals to introduce a dark fibre (DF) remedy with active minus pricing. In particular, we have been asked to review the arguments and evidence presented by Ofcom in terms of the risks and benefits associated with the introduction of DF. This includes a consideration of any balancing framework Ofcom has used to demonstrate that the introduction of DF remedies would be net beneficial and proportionate. We have also been asked to comment on the consequences of Ofcom's approach to market definition for its decision to impose DF in those areas it identifies BT as having Significant Market Power.

In the context of our terms of reference, this report is structured as follows:

- In section 2, we evaluate Ofcom's approach to product and geographic market definition and its consequences for the introduction of DF remedies;
- In section 3 we outline the structure of Ofcom's arguments and its approach to assessing the likely impact of introducing passive remedies and evaluate this in section 4.
- Section 4.1 focuses on Ofcom's assessment of the risks associated with the introduction of passive remedies and its presumption that they will be limited. In particular we assess the validity of Ofcom's implicit assumption that setting the price of DF on an 'active minus' basis relative to a particular benchmark active product (EAD 1Gb/s) is able to mitigate many of the risks;
- In section 4.2 we consider Ofcom's assessment of the benefits, and the lack of sufficient evidence to support its view that DF will provide benefits over an active only regime.
- in section 4.3 we build the case that Ofcom's analysis is lacking a clear overall balancing framework to demonstrate that the package of remedies proposed is net-beneficial and

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<sup>6</sup> We refer to this hereafter as the 'consultation document'

presents the best form of intervention to address the competition issues identified.

- In section 5 we conclude that Ofcom's approach is not sufficient to justify the introduction of DF and provide suggestions for particular aspects of its approach that need to be re-evaluated.

Whilst the focus of this report is a high level assessment of the proposals put forward in the consultation document we recognise that for completeness, an understanding of the proposals outlined in the Leased Lines Charge Control (LLCC) consultation of 12 June 2015 is important.<sup>7</sup> In this regard, in writing this report we have considered the proposals outlined in the LLCC consultation with a particular focus on Ofcom's guidance for the 'active-minus' pricing structure for DF and the adjustments made to the active-access pricing regime relative to the 2013 BCMR.

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<sup>7</sup> We refer to this hereafter as the LLCC consultation.

## 2 Market Definition

Ultimately any need for passive remedies must derive from a demonstrated lack of effective competition within a properly defined relevant market. The analysis of passive remedies should start not with the question of ‘what could passives do?’ but rather with that of ‘what problem is being solved?’ Ofcom must justify the need for the introduction of passive remedies by defining the product and geographic scope of the business connectivity market, identifying SMP and then demonstrating that intervention in the form of passive remedies is evidence-based, proportionate and present the most appropriate form of regulatory intervention in line with its Regulatory Principles.

*Competition varies by location*

The market definition and competition assessments are significantly more complex here than most typical exercises undertaken by competition authorities, as both actual and potential competition vary with location, there is great heterogeneity of customers and the market involves an evolutionary set of products subject to technical progress. Ofcom recognises that conditions of competition may vary by location depending on the extent of infrastructure provision by other CPs.<sup>8</sup> However, it considers that competitive conditions across services of different bandwidths within a particular geographical area are homogeneous because “[t]he ability of CPs to compete using this infrastructure will be similar across the product range”.<sup>9</sup> Therefore, Ofcom concludes that “...the intensity of competition varies primarily by geography...rather than by service within a given geographic area.”<sup>10</sup>

*Changed market definitions*

Ofcom has changed its product and geographic market definition in a number of ways since the 2013 BCMR. In addition to the market for legacy services (Traditional Interface Symmetric Broadband Origination - TISBO), Ofcom is now defining a single product market for leased lines services that combines the previous MISBO (Multiple Interface Symmetric Broadband Origination) and AISBO (Alternative Interface Symmetric Broadband Origination) services into a single CISBO market (Contemporary Interface Symmetric Broadband Origination), which includes Ethernet and WDM leased line services at all bandwidths. Further, Ofcom has again changed its geographical market definition relative to the 2013 findings,

<sup>8</sup> “the intensity of competition in a given area is likely to depend primarily on the number of competing networks in that area.” See paragraph 4.7 of the consultation document.

<sup>9</sup> See paragraph 4.8 of the consultation document.

<sup>10</sup> See paragraph 4.9 of the consultation document.

narrowing from WECLA (West, Eastern and Central London Area) to CLA (Central London Area), differentiating this from the LP (London Periphery) and RoUK (Rest of UK excluding Hull).

Ofcom's approach is reminiscent of that adopted for residential broadband, where geographical markets have been distinguished based on the number of distinct potential suppliers in a local exchange area (i.e. Markets A and B).<sup>11</sup> However, unlike residential broadband, leased lines and their customers are highly heterogeneous. Therefore, we cannot simply assume that competitive conditions at a location are similar for very different services.

*Geographic and product market interaction*

In reality, actual and potential competition will vary greatly between and within locations. One particular issue is that demand for services may tend to be clustered at particular locations, which can enhance motivations for competitive supply. This will also vary across different product types, but is particularly true for high bandwidth services. For example Central Business Districts may have 'clusters' of business with high bandwidth demand.

Ofcom is clearly alert to the importance of these geographical issues and considers how competition varies between different locations. In this respect, Ofcom as part of its market definition exercise considers geographical aspects of competition, defining geographic market boundaries based on a range of metrics that indicate actual or potential presence of competition.

*Ofcom's analysis of product and geographic markets*

However, one must also consider the interaction between the service characteristics and location when considering both current competition and potential entry. Having first defined the product market and then separately defined the geographic market, Ofcom does, as part of the competitive assessment consider competitive conditions in very high CISBO to see if this supports the proposals for a single product market. However, there are several implications for product market definition as a result of Ofcom's geographic market definition exercise, that are not satisfactorily considered.

Ofcom's approach falls short of taking into account the important interactions between product and geographic aspects of these services that will have an effect on the level of competition. For example, there will undoubtedly be differences in competition where there is geographical clustering of high bandwidth services, yet the way in which Ofcom has defined geographic market boundaries, clustering is overlooked. As a consequence of its approach, Ofcom incorrectly characterises competitive conditions

<sup>11</sup> See Ofcom, 26 June 2014, 'Review of the wholesale broadband access markets – Statement on market definition, market power determinations and remedies'.

as homogeneous across different product bandwidths within each geographic market.

*Market shares and high bandwidth services*

Where Ofcom considers market shares as part of the geographic market definition and competition assessment, the assessment is flawed. Ofcom's decision to define a single product market for all Ethernet services at all bandwidths (CISBO) including very high CISBO services, leads Ofcom to conclude (incorrectly) that the very high CISBO services are not facing sufficient competition anywhere outside of the Central London Areas (CLA). This follows from Ofcom's reliance on 'chain of substitution' arguments to justify the definition of a single product market, yet there is insufficient evidence to support its arguments.

Overall, we consider that Ofcom's market definition exercise results in a set of accumulating biases against high bandwidth services, leading it to consider that there is still insufficient competition in the provision of these services. These biases have consequences for the decision to impose passive remedies in the form of DF, given that such high bandwidth services will likely be substitutable for DF.

*Structure of this section*

In this section we set out our understanding of the approach adopted by Ofcom in delineating markets (as set out in Section 4 and in Annexes 8 and 21 of Ofcom's consultation for the product market and geographic market definition respectively). This includes the product market definition exercise, its "modified greenfield" assumptions and its approach to setting the geographic boundaries of CLA, LP and RoUK. Whilst we do not aim to provide a full critique of Ofcom's market definition exercise, we consider that it is necessary to understand Ofcom's approach insofar as its conclusions can have significant implications for the impact of the remedies it proposes to introduce, in particular DF.

## 2.1 Product market definition

*Brief overview of Ofcom's approach*

Annex 8 of the consultation document outlines Ofcom's approach to product market definition, which follows a 'modified greenfield approach' as was the case in the 2013 review.<sup>12</sup>

Ofcom state that the delineation of market boundaries requires consideration of the likely strength of competitive constraints from demand and supply-side substitution. It considers that "[d]emand for wholesale products derives from demand for retail services"<sup>13</sup> and

<sup>12</sup> This means that Ofcom conducts the market definition exercise under the assumption that there are no ex ante SMP remedies in the reference market, but ex ante SMP remedies in other markets continue to apply.

<sup>13</sup> See paragraph A8.8 of the consultation document.

that demand-side substitution at the retail level is relevant for wholesale product definition as it imposes indirect constraints on the wholesaler's behaviour.<sup>14</sup> Therefore, Ofcom begin by focussing on substitutability between products at the retail level. Where two products are close substitutes at the retail level, it considers this to mean that the wholesale market should also include both products.

*Lack of SSNIP test*

Although Ofcom refer to demand side substitution and mention HMT and SSNIP test<sup>15</sup>, it has not performed an actual SSNIP test for its definition of a single CISBO market. The survey evidence that it presents does not consider responses to relevant price changes and there is no consideration of a thought experiment to consider the proportions of particular customer groups that could switch. The possibility of customers switching in response to a SSNIP is briefly discussed only in relation to the TI market<sup>16</sup> and in considering the demands of MNOs.<sup>17</sup>

Whilst placing an emphasis on demand-side substitution, as specified in Annex 8 of the Consultation, there are four main components to Ofcom's product market definition approach adapted to business connectivity markets:

*Consideration of services other than leased lines in the product market*

First, Ofcom consider "*whether asymmetric broadband services might impose a sufficient constraint on leased lines prices to be included in the same market,*"<sup>18</sup> and also consider whether Ethernet first Mile (EFM) should be included.

*Consideration of demand and supply side substitution*

Second, demand and supply side substitution possibilities are taken into account, including:

- Technical or qualitative characteristics – including differences in product characteristics between services;
- Pricing information – assuming that "*if two products perform a similar function and have similar prices it is more likely that they are substitutes than if prices are very different*";
- Consumer survey evidence – to get consumer views on which services are good substitutes (BDRC conducted a

<sup>14</sup> "*If such retail substitution would be sufficient to limit the ability of a wholesale operator to profitably raise wholesale prices by any significant amount then an indirect constraint exists. Such indirect constraints might lead to wholesale products being included in the same relevant market even if those products do not constrain each other directly at the wholesale level.*" See paragraph A8.9 of the consultation document.

<sup>15</sup> See paragraph A8.4 of the consultation document.

<sup>16</sup> See for example paragraph A10.24 of the consultation document.

<sup>17</sup> See for example paragraphs A11.57 & A11.58 of the consultation document.

<sup>18</sup> See paragraph A8.11 of the consultation document.

consumer survey to determine consumer preferences and to gather views on likely switching intention in future);

- CPs' approaches to marketing different business connectivity services and their views on market definition; and
- Barriers to switching.<sup>19</sup>

*Chain of substitution analysis*

Third, Ofcom acknowledge that it is possible that some access services could fall within a single market if they are linked by a chain of substitution by an intermediate product. However, where there is evidence to suggest clear breaks in the chain of substitution, separate product markets may be appropriate.<sup>20</sup>

*Homogeneity of competitive conditions*

Fourth, Ofcom also consider that, "[e]ven if services are not demand or supply-side substitutes, it can sometimes be appropriate to analyse them as constituting part of the same market if competitive conditions in the supply of the two services are sufficiently homogenous."<sup>21</sup>

Ofcom's analysis (presented in Section 4 of the consultation document) largely follows this approach, considering elements of all four aspects outlined above; although it does not necessarily consider each of these points in turn.

*EFM included but asymmetric broadband excluded*

Ofcom first considers whether EFM and asymmetric broadband (including NGA) should be in the market. It chooses to exclude asymmetric broadband on the basis that "...the evidence indicates that substitutability is insufficiently strong...and this will remain so over the course of the three year review period"<sup>22</sup>, and include EFM on the basis that "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."<sup>23</sup>

*No 'clear breaks' in the chain of substitution*

Ofcom then focuses on chain of substitution arguments to establish the bandwidths that should be included in the CISBO market, including whether there are any 'clear breaks' in the chain. In doing so, rather than assessing demand-side substitutability in terms of interdependence of prices and consumer switching behaviour, Ofcom assesses whether there are any breaks in the chain by considering whether there are large discontinuities in the: technical characteristics, price and cost of products at different bandwidths.<sup>24</sup>

<sup>19</sup> See paragraph A8.13 of the consultation document.

<sup>20</sup> See paragraph A8.15 of the consultation document.

<sup>21</sup> See paragraph A8.21 of the consultation document.

<sup>22</sup> See paragraph 4.20 of the consultation document.

<sup>23</sup> See paragraph 4.24 of the consultation document.

<sup>24</sup> See paragraph 4.33 of the consultation document.

On the supply-side Ofcom assumes there is substitutability because a CP can supply any bandwidth it wishes over its existing infrastructure i.e. it assumes there is homogeneity of competitive conditions.<sup>25</sup>

Ofcom has put considerable weight on the chain of substitution analysis that leads it to consolidate the AISBO and MISBO markets (as defined in the 2013 BCMR) into a single CISBO market, including services and all bandwidths and interface types. Ofcom justifies its choice on the basis that there are no 'clear breaks' in the chains of substitution between low and high bandwidth leased line services.

Furthermore, Ofcom does not consider the much lower service shares for higher bandwidth CISBO services to be sufficient to justify a separate product market. However, by including these high bandwidth services in the same product market as all other CISBO services, this will have implications for the SMP assessment and is therefore particularly relevant to the imposition of DF remedies, as we discuss in section 2.3 below.

### 2.1.1 Ofcom's chain of substitution analysis

Ofcom's decision to define a single product market for CISBO services relies on its chain of substitution analysis, so we consider this analysis in more detail. Ofcom begins by considering the demand- and supply-side substitution possibilities, stating that:

- *"On the demand side, the main difference between CISBO users is their bandwidth requirements... whilst customers may have varied demands for bandwidth, these demands could in principle be satisfied by using a single high capacity line or multiple low capacity lines, so in terms of satisfying customer requirements there is very close demand side substitutability across the range."<sup>26</sup>*
- *"On the supply side... 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 services themselves differ only in the equipment at the circuit*

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<sup>25</sup> *"This is because CISBO 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."* See paragraph 4.34 of the consultation document.

<sup>26</sup> See paragraph 4.32 of the consultation document.

*ends, and where circuits use the same interface but offer different bandwidths the equipment is virtually identical.*<sup>27</sup>

Taking this as its starting point, Ofcom considers the evidence for breaks in the chain of substitution for lower bandwidth CISBO services and then considers whether there is a separate market for very high CISBO.

*Chain of substitution for lower bandwidth CISBO services*

For the chain of substitution for lower bandwidth CISBO services, Ofcom looks at price and cost differences and considers that, *“we know from our analysis of equipment costs that these differences in BT’s charges are not driven by bandwidth-related cost differences... 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 of circuits of different bandwidths.”* Ofcom then concludes, *“we consider that the price and cost differences are consistent with low, medium and high CISBO being part of a single product market.”*<sup>28</sup>

*A separate market for very high CISBO*

To assess whether there is a separate market for very high CISBO, Ofcom considers that *“[e]vidence 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.”*<sup>29</sup> In coming to this conclusion they consider:

- the differences in service features and quality between WDM services and Ethernet services (finding them to be less significant than in 2013);
- price and cost evidence (finding that this no longer points to a clear “break” in the chain of substitution); and
- analysis of competitive conditions and BT’s service shares in very high CISBO.

*Ofcom combines WDM and Ethernet in the same market due to scalability*

Ofcom’s arguments provided alongside its presentation of pricing evidence (for example at paragraphs 4.63 and 4.64) are only likely to be significant in dense business areas like CLA. For example, Ofcom considers that WDM equipment allows scalability and the ability to recover cost from multiple connections in the case that additional users are connected or additional service connections are provided to the same end user at very low incremental cost. Ofcom considers

<sup>27</sup> See paragraph 4.34 of the consultation document.

<sup>28</sup> See paragraphs 4.37-4.42 of the consultation document.

<sup>29</sup> See paragraph 4.46 of the consultation document.

that this may be a signal of price convergence or reductions in the price of WDM services bringing them closer in price to Ethernet services.

*No clear break in the chain*

In section 4.3.5 of the consultation document, Ofcom provides further explanation for its decision not to separate very high CISBO into a separate market. Re-emphasising that its evidence on the chain of substitution 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). Further, Ofcom argues, *“the fundamental homogeneity of competitive conditions across services provided over a common infrastructure also supports definition of a single market.”*<sup>30</sup>

*Ofcom dismisses low market shares for high bandwidth services*

Ofcom’s characterisation of the competitive conditions is at odds with its findings that market shares are in fact significantly different at different bandwidths. BT’s service shares in the very high bandwidth segment are lower than in other segments, and below the threshold *“normally associated with concerns for single firm dominance (40%)”*.<sup>31</sup> Ofcom disregards this evidence based on its presumption that competitive conditions are homogenous and its belief that the market share data does not imply *“a fundamental and sustainable difference in competitive conditions... that supports a separate product market for very high CISBO.”*<sup>32</sup> Ofcom considers that service shares in very high CISBO do not provide a good indication of competitive conditions and that other conditions are consistent with the lack of effective competition for very high CISBO services.

## 2.1.2 Our assessment of Ofcom’s chain of substitution arguments

*There should be no presumption that there is a single product market*

On the chain of substitution, in Annex 8 of the consultation document, Ofcom makes reference to the Explanatory note to the EC Recommendation. Ofcom considers that in the absence of evidence of clear breaks in the chain of substitution, there may be reasons to include differentiated products in the same product

<sup>30</sup> See paragraph 4.129 of the consultation document.

<sup>31</sup> See paragraph 4.131 of the consultation document.

<sup>32</sup> See paragraph 4.132 of the consultation document.

market.<sup>33</sup> However, the European Commission's recommendation on relevant product markets supports the view that even where clear breaks are not evident in some markets *"close attention should be paid to the nature of the access products when conducting the substitutability analysis."*<sup>34</sup> A careful and considered substitutability analysis is important and NRA's cannot simply rely on the finding that there are no clear breaks to conclude that products are in the same market.

We recognise that in practice, it could be that bandwidth breaks are highly uncertain and there may be much ambiguity over the levels at which they might fall. However, Ofcom appears to take uncertainty over the position of bandwidth breaks as a justification for not having any breaks at all.<sup>35</sup> This is conceptually wrong. Clearly it is possible to know that there need to be bandwidth breaks at the same time as being uncertain about where they fall (and indeed how many breaks there might be).

In respect of the leased lines market, the European Commission also recognises that high-bandwidth services are typically separated from lower bandwidths and are found to be competitive in a number of Member States.<sup>36</sup> Furthermore, *"competitive conditions in the high-bandwidth segment may vary depending on the geographical area – more precisely, the density of business or other*

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<sup>33</sup> Ofcom refers to the EC Explanatory Memorandum, explaining that this *"...observes that superficially distinct high quality access services could fall within a single market if they are linked by a chain of substitution via an intermediate product(s). The Explanatory Memorandum explains that, if so, "both ends of the chain belong to the same market as they are both constrained by the same product(s)."*

<sup>34</sup> Full quote: *"NRAs' analyses so far have not shown significant breaks in the chain of substitution when comparing current copper-based broadband services to those provided over optical fibre.... However, close attention should be paid to the nature of the access products when conducting the substitutability analysis."* See, European Commission, 9 October 2014, "Commission Staff Working Document Explanatory Note, Accompanying the document 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", p 40 (referred to hereafter as "EC explanatory note on relevant markets").

<sup>35</sup> At paragraph 4.66 of the consultation document, Ofcom conclude that there is differentiation across the product range (in terms of price and cost evidence), but no clear "break" in the chain.

<sup>36</sup> *"Following the 2007 Recommendation, a large number of NRAs has segmented the regulated leased lines market according to bandwidth. This division was warranted in order to take into account the fact that lower-bandwidth leased lines are no longer attractive to new entrants who prefer to focus their infrastructure investments on the more profitable, high-speed leased lines. Consequently, the market for high-speed leased lines was found competitive in a number of Member States."* EC explanatory note on relevant markets, p 51

*large customers.*<sup>37</sup> Hence, the European Commission's view (based on the findings from a number of NRAs) is that competitive conditions across bandwidths are not always homogenous within or across geographical areas.

*Ofcom has not conducted any analysis of switching between low and high bandwidth services*

In its analysis, Ofcom has not performed a formal HMT or SSNIP test when considering the definition of the CISBO market and the chain of substitution between services at different bandwidths. The survey evidence that it presents does not consider responses to relevant price changes and there is no consideration of a thought experiment to assess the proportions of particular customer groups that could switch in response to price changes. For example, although Ofcom does present some results of consumer research in which it asked consumers about switching behaviour, Ofcom itself notes that: "*these answers do not tell us how users would respond to changes in the relative prices of NGA and leased lines, which is the relevant question for market definition purposes*".<sup>38</sup>

We would expect that given bandwidth growth and the fact that business consumers will regularly review their requirements and re-specify them, it is reasonable to assume that the predominant pricing interaction between services at different bandwidths is through the potential for customers at lower bandwidths to upgrade to services at higher bandwidths. Therefore, to reach the conclusion of a single market Ofcom must be implicitly assuming that there are a sufficient number of customers at lower bandwidths who might switch to higher bandwidths such that the pricing of higher bandwidth services is constrained relative to lower bandwidth ones, assuming all are supplied by a hypothetical monopolist. However, Ofcom provides no evidence of this; it strains credibility to believe that this condition would be satisfied for low bandwidth services.

*Trends in price and costs do not provide adequate evidence of a single market*

It is not the case that considering trends of prices and costs *alone* (stating that price differentials between low and high bandwidth services have narrowed, as have the cost differentials between services<sup>39</sup>) is the correct evidential basis on which to consider whether the products should be included in the same market.

*What evidence would be sufficient?*

There is a requirement to provide sufficient evidence to justify a single product market definition on the basis of chains of substitution, which Ofcom has failed to provide. As demonstrated in the Austrian Leased Lines case (see Box below) the European Commission and BEREC require a high standard of evidence to

<sup>37</sup> EC explanatory note on relevant markets, p 51

<sup>38</sup> See paragraph A9.37 of the consultation document.

<sup>39</sup> See paragraph 4.66 of the consultation document

justify a single market, including an assessment of cross-price elasticities in addition to other product features such as product functionalities, intended use and price evolution. This example shows that Ofcom has not advanced sufficient evidence to show that there is a single chain of substitution, as Ofcom has failed to conduct any cross-price elasticity analysis as part of its product market definition. Similarity of price and cost at one point in time does not show that prices are interlinked by constraints arising from substitution.

### Case precedent – Austrian Leased Lines Case

In 2013, following a phase II investigation the European Commission vetoed the Austrian telecoms regulator RTR's draft measure concerning the terminating segments of leased lines. The European Commission's Decision to reject RTR's proposals was "*mainly on the basis that RTR did not provide sufficient evidence justifying (i) the alleged homogeneity of market conditions, which could justify the proposal to define a single wholesale product and geographic market for terminating segments of leased lines and (ii) finding of SMP of A1 TA at least in the high capacity segment of the market.*"<sup>40</sup>

RTR's original decision to propose a single wholesale product market – including all bandwidth categories – was based on chains of substitution arguments. In particular, "*RTR found that the differences between bandwidths of e.g., 64 kbit/s, nx64 kbit/s, 2 Mbit/s, 34 Mbit/s, and 150 Mbit/s are sufficiently small that the price of any given bandwidth is influenced by the price of the neighbouring one.*"<sup>41</sup>

However, RTR's chain of substitution argument was not supported, in BEREC's view, with evidence that "*there is a high degree of demand side substitution between low and high bandwidth on the market in Austria.*"<sup>42</sup> Furthermore, the European Commission expressed serious doubts that RTR's homogenous product market definition complied with Article 8 (5) (a) to (c) of the Framework Directives given the circumstances and "*in the absence of a sound substitutability analysis based on more detailed data.*"<sup>43</sup> Indeed the European Commission explained that "*the boundaries of a particular market must be established on the basis of substitutability test that analyses product functionalities, intended use, price evolution, and cross price elasticity.*"<sup>44</sup>

<sup>40</sup> (Emphasis added) European Commission, 6 June 2014, 'Commission Decision concerning Case AT/2014/1599: Wholesale terminating segments of leased lines in Austria, Comments pursuant to Article 7(3) of Directive 2002/21/EC', C(2014) 3966 final, p 3. Available at: [http://www.mlex.com/EU/Attachments/2014-06-18\\_BEY5T7SV245DJJ67/AT-2014-1599%20ADOPTED\\_EN.pdf](http://www.mlex.com/EU/Attachments/2014-06-18_BEY5T7SV245DJJ67/AT-2014-1599%20ADOPTED_EN.pdf)

<sup>41</sup> European Commission, 3 May 2013, "Commission decision concerning Case AT/2013/1442: Wholesale terminating segments of leased lines in Austria, Opening of Phase II investigation pursuant to Article 7 of Directive 2002/21/EC as amended by Directive 2009/140/EC, Comment pursuant to Article 7(3) of Directive 2002/21/EC, footnote 17, p 4. Referred to as "Commission decision concerning Case AT/2013/1442"

<sup>42</sup> BEREC, 3 June 2013, 'BEREC Opinion on Phase II investigation pursuant to Article 7 (3) of Directive 2002/21/EC as amended by Directive 2009/140/EC: Case AT/2013/1442 Wholesale terminating segments of leased lines (Market 6) in Austria', footnote 3, p 7. Available at: [http://berec.europa.eu/eng/document\\_register/subject\\_matter/berec/opinions/12-93-berec-opinion-on-phase-ii-investigation-pursuant-to-article-7-3-of-directive-200221ec-as-amended-by-directive-2009140ec-case-at20131442-wholesale-terminating-segments-of-leased-lines-market-6-in-austria](http://berec.europa.eu/eng/document_register/subject_matter/berec/opinions/12-93-berec-opinion-on-phase-ii-investigation-pursuant-to-article-7-3-of-directive-200221ec-as-amended-by-directive-2009140ec-case-at20131442-wholesale-terminating-segments-of-leased-lines-market-6-in-austria)

<sup>43</sup> Commission decision concerning Case AT/2013/1442, p 8.

<sup>44</sup> (Emphasis added) Commission decision concerning Case AT/2013/1442, p 7.

Hence both the European Commission and BEREC did not believe that the regulator could rely on its chains of substitution arguments to conclude that all bandwidths could be included in a single product market. In this case both the European Commission and BEREC required further evidence to show that there is a high degree of substitution between low and high bandwidths – evidence which was missing in RTR’s analysis and is also absent in Ofcom’s analysis.

Following the European Commission’s Decision and further analysis of the market conditions in Austria RTR submitted a revised draft measure in April 2014. RTR did a complete U-turn on its single product market definition by instead proposing to split the product market according to low bandwidth services (up to and including 2 Mbit/s speeds) and high bandwidth services (speeds higher than 2 Mbit/s). Furthermore, RTR found that for the higher bandwidth services this could be split further into two markets because competition for higher bandwidth services was not homogenous across the national geographic market.

*“1) Market 1: the wholesale market for terminating segments of leased lines with speeds higher than 2 Mbit/s (including dark fibre ends) within the 359 communes set out in Annex 1 of its notification; and*

*2) Market 2: the wholesale market for terminating segments of leased lines with speeds higher than 2 Mbit/s (including dark fibre ends) outside these 359 communes and with speeds of up to and including 2 Mbit/s (excluding dark fibre ends) in the entire territory of Austria.”<sup>45</sup>*

Furthermore, RTR concluded that despite there continuing to be high barriers to entry in market 1 *“this market is characterised with a tendency towards effective competition, which led it to conclude that ex ante regulation is no longer warranted for this market.”<sup>46</sup>*

*Need for sufficiently strong substitution to form a chain*

Although chains of substitution arguments suggest that products at one end of the chain can impose indirect constraints on products at the other end of the chain, it is the strength of these constraints that is important for the market definition. There must be sufficient evidence to demonstrate the strength of indirect constraints. Simple chain of substitution arguments cannot be a substitute for the hypothetical monopolist test when defining a market. The OFT and the European Commission guidelines on market definition support this view. For example, the OFT market definition guidelines state, *“even though all products in the chain are substitutes,*

<sup>45</sup> European Commission, 6 June 2014, ‘Commission Decision concerning Case AT/2014/1599: Wholesale terminating segments of leased lines in Austria, Comments pursuant to Article 7(3) of Directive 2002/21/EC’, C(2014) 3966 final, pp 4-5.

<sup>46</sup> European Commission, 6 June 2014, “Commission Decision concerning Case AT/2014/1599: Wholesale terminating segments of leased lines in Austria, Comments pursuant to Article 7(3) of Directive 2002/21/EC”, C(2014) 3966 final, p 5.

*this does not mean the whole chain is the relevant market*<sup>47</sup> and the EU commission acknowledges, *“the concept of chains of substitution has to be corroborated by actual evidence, for instance related to price interdependence at the extremes of the chains of substitution, in order to lead to an extension of the relevant market in an individual case”*.<sup>48</sup>

The European Commission in its guidelines for electronic communications networks and services reiterates this requirement for substantiated evidence of substitutability: *“Evidence should show clear price interdependence at the extremes of the chain and the degree of substitutability between the relevant products or geographical areas should be sufficiently strong.”*<sup>49</sup> For example, in *Pirelli/BICC* the Commission disagreed with the arguments for a single market for energy power cables based on chains of substitution logic used to link low, medium and high voltage cables. The Commission considered that there was no definite evidence that one extreme of the chain was constrained by the other i.e. there was insufficient evidence to demonstrate that cable prices in high voltage ranges constrain prices in low voltage ranges. As a result, the Commission split the market between low/medium voltage cables and high voltage power cables.<sup>50</sup>

*The longer the chain, the more likely there are to be breaks*

There are often breaks in the chains of substitution and as a chain increases in length it becomes more likely that a SSNIP would be profitable for only some part of that chain. For example the Australian Competition & Consumer Commission (ACCC) merger guidelines states that *“as a chain of substitution expands, the proportion of customers that can switch to neighbouring links in the chain (marginal customers) will tend to decrease and at some point a hypothetical monopolist controlling the chain would find a SSNIP profitable regardless of those switching customers”*.<sup>51</sup> The proportion

<sup>47</sup> OFT, December 2004, “Market definition, Understanding Competition Law”, paragraph 3.11, p 12. Available at: [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/284423/oft403.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/284423/oft403.pdf)

<sup>48</sup> European Commission, 9 December 1997, “Notice on the definition of relevant market for the purposes of Community competition law” (97/C 372/03), paragraph 58. Available at: [http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:31997Y1209\(01\)&from=EN](http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:31997Y1209(01)&from=EN)

<sup>49</sup> European Commission, 11 July 2002, “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), footnote 50.

<sup>50</sup> Case COMP/M.188 - *Pirelli/BICC* of the European Commission. Available at <http://old.eu-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2003:070:0035:0049:EN:PDF>

<sup>51</sup> ACCC, November 2008, “Merger Guidelines”, p 22. Available at: <https://www.accc.gov.au/system/files/Merger%20guidelines.pdf>

of customers that can switch to neighbouring links is likely to decrease because the longer the chain of products the more important factors that prohibit customers from switching such as transport costs become and therefore the less likely that customers will switch.<sup>52</sup> Aproskie and Lynch (2012)<sup>53</sup> provide a simple model to demonstrate the level of switching needed for products to be included in a single market through chains of substitution. They show that even where there are very high margins on the products, the proportion of customers switching due to a 5% SSNIP has to be very large for the price increase to be unprofitable and therefore for long chains of substitutes to be included in a single market.

*Uncertainty about the location of breaks does not mean they do not exist*

We recognise that in practice, it could be that bandwidth breaks are highly uncertain and there may be much ambiguity over the levels at which they might fall. However, Ofcom appears to take uncertainty over the position of bandwidth breaks as a justification for not having any breaks at all.<sup>54</sup> This is conceptually wrong. Clearly it is possible to know that there need to be bandwidth breaks at the same time as being uncertain about where they fall (and indeed how many breaks there might be). As is demonstrated from the guidance, case precedent and literature, a wide range of further evidence must be considered to determine whether a single product market is justified. Ofcom has not provided sufficient evidence to clearly justify a single product market for all CISBO services at all bandwidths on the basis of chain of substitution arguments, in particular the absence of an assessment of cross-price elasticities and demonstration that prices are interlinked by constraints arising from substitution.

*Scalability depends on demand which may vary by geography*

Additionally, Ofcom's choice to combine WDM and Ethernet in the same market due to scalability relies on an implicit assumption that there is a sufficient concentration of businesses and sufficient demand such that connecting more customers from a 'single service' is viable. Where there is a clustering of demand, this is likely to be an issue, but may not necessarily be the case for the whole of the UK.

<sup>52</sup> Cooper T.E. 1986 "Indirect Competition with Spatial Product Differentiation", The Journal of Industrial Economics Vol. 37, No 3. (Mar.,1989) pp.241-257.

<sup>53</sup> Aproskie J and Lynch S, 30 August 2012, "The chain of substitution in market definition: pitfalls in application". Available at: <http://www.compcom.co.za/wp-content/uploads/2014/09/Aproskie-and-Lynch-Chain-of-substitution-in-market-definition-Competition-Conference-2012.pdf>

<sup>54</sup> At paragraph 4.66 of the consultation document, Ofcom conclude that there is differentiation across the product range (in terms of price and cost evidence), but no clear "break" in the chain.

## 2.1.3 Service shares for high bandwidth services

*Despite very low market shares for very high CISBO, Ofcom discounts the relevance of this*

When considering the high bandwidth leased line services, in addition to differences in service features, quality, price and cost evidence, Ofcom considers the competitive conditions and service shares in very high CISBO. Ofcom recognise, “BT’s share of 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”<sup>55</sup> however, they discount the relevance of this when considering whether a separate market is required.

Ofcom do not consider there to be sufficient evidence to demonstrate a “fundamental and sustainable difference in competitive conditions to the rest of the CISBO market”<sup>56</sup> because it considers there to be limitations of service share analysis in very high CISBO and there is ‘other evidence’ pointing to a lack of effective competition. Ofcom considers therefore, “competitive conditions should be similar across bandwidth segments within the same area”<sup>57</sup>.

*According to Ofcom there are a number of factors that limit the validity of service shares for very high CISBO*

Ofcom considers the following limitations of service share analysis at very high CISBO<sup>58</sup>

- **Missing information on net provision** – Ofcom argues “some operators, including [redacted for confidentiality] could not provide information on the mode of provision (on-net, off-net) for a large proportion of very high CISBO services.” Given this limitation, Ofcom assumes that a service is supplied as on-net where the operator has a flexibility point within 200m of the site to which the service is supplied. While Ofcom considers this an appropriate assumption it recognises that this raises uncertainty regarding estimates.
- **Limited volumes** – volumes are limited and within narrow geographic areas therefore Ofcom states that this implies that “estimates likely provide less reliable indication of current and future competitive conditions” and that “[t]his problem is further exacerbated by the presence of large contracts and by the high growth in volumes.”
- **Migration** – migration from medium/high CISBO to very high CISBO can have a big impact on future shares because

<sup>55</sup> See paragraph 4.67 of the consultation document.

<sup>56</sup> See paragraph 4.67 of the consultation document.

<sup>57</sup> See paragraph 4.136 of the consultation document. See sections 4.3.5.1 and 4.3.5.2 of the consultation document for more on Ofcom’s reasoning.

<sup>58</sup> See paragraph A13.26 of the consultation document.

volumes of medium/high CISBO are significantly greater than those of very high CISBO and CPs may manage to retain customers upgrading bandwidth. Ofcom considers that *“migration would likely increase the shares of CPs with significant sales in mid/very high CISBO (BT, most prominently).”*

- **Pricing and positioning** – according to Ofcom, current market shares are a result of BT’s pricing and product position decisions: the bandwidth gradient and fixed costs create incentives for CPs to enter the market at higher bandwidths. Further, Ofcom note that another supplier of high bandwidth services uses WDM-based services to meet requirements for which BT offers its standard Ethernet 1Gbit/s services.

The data shows significantly lower shares for very high bandwidth shares,<sup>59</sup> so Ofcom’s decision to discount entirely the relevance of these figures is an extreme response. The arguments put forward by Ofcom above do not appear to justify the complete dismissal of the service share data for these services.

*Uncertainties are likely to be insignificant*

For example, in relation to the uncertainty regarding estimates arising from Ofcom’s assumption of off-net services, there is a contradiction with the analysis presented by Ofcom in Annex 15.<sup>60</sup> Ofcom found that there is not a significant difference between its estimate of the number of off-net services and the number of purchases reported. If this is the case, then Ofcom cannot dismiss the use of service share data when assessing SMP for very high CISBO services on the basis of uncertainty.

*Very high bandwidth services are disproportionately provided in areas where there are alternative suppliers*

Ofcom’s points about limited volumes and migration possibilities are closely linked to its concern that despite low market shares at present, BT may ‘reassert’ itself in the market. However, it is unlikely that the areas in which very high bandwidth services are competitively provided will see any reduction in the level of competition over time. Currently, these services are disproportionately provided in areas where there are alternative suppliers (hence the low market shares), so it is likely that competition for these services in such areas will continue. We acknowledge that if BT chooses to provide these very high bandwidth services in new areas (where it is the sole supplier), then

<sup>59</sup> See table 4.4 of the consultation document.

<sup>60</sup> In Annex 15 Ofcom describes its methodology for estimating on-net services. Ofcom states that it checked its analysis by comparing *“the number of off-net sales for the relevant CPs (after we have used postcode information to fill any on-net information gaps) with the number of purchases they report and have not found them to be significantly different.”* (See paragraphs A15.109-A15.110 of the consultation document).

its average (national) share may increase, but this will not affect the level of competition in the areas where there is already competitive supply.

*Competitively supplied areas are likely to remain competitive*

Ofcom's conclusion that BT may re-assert itself and see increased shares, is purely speculative and Ofcom has not provided any evidence to demonstrate why it is reasonable to expect this to be the case going forward. Ofcom's assessment ignores the possibility of regional variations where areas where high bandwidth services are competitively supplied are likely to remain competitive. This demonstrates another important consequence of Ofcom's failure to differentiate competitive conditions between geographies.

Finally, Ofcom's assumption that the difference in market share at the higher bandwidths is a result of BT's pricing and product decisions is far too simplistic and ignores the fact that those sites which demand higher bandwidths are inherently of higher value. We understand from BT, "[t]he reason that there is higher competition at higher bandwidths is because OCPs can spread the high fixed costs of customer marketing and sales across a high value of the site itself which is set at the downstream level of a multi-site contract and de-risk the sunk investments."<sup>61</sup> Furthermore, this trend (i.e. entrants preferring to invest in high bandwidth services) is evident across many European states where BT does not operate.<sup>62</sup>

*Ofcom considers there is a lack of effective competition*

Ofcom's, other evidence pointing to lack of effective competition includes:

- only one large rival to BT in RoUK (Virgin Media) which is unlikely to offer an effective constraint on BT as the segment evolves;
- profits and prices in this segment remain high (ROCE on MISBO increased to 32% outside WECLA in 2013/14); and
- BT's strong position across the CISBO range is likely to reassert itself over time as prices change and users move between bandwidth segments.<sup>63</sup>

<sup>61</sup> See section 12 of BT's response to the consultation document.

<sup>62</sup> "Following the 2007 Recommendation, a large number of NRAs has segmented the regulated leased lines market according to bandwidth. This division was warranted in order to take into account the fact that lower-bandwidth leased lines are no longer attractive to new entrants who prefer to focus their infrastructure investments on the more profitable, high-speed leased lines. Consequently, the market for high-speed leased lines was found competitive in a number of Member States." EC explanatory note on relevant markets, p 51

<sup>63</sup> See paragraphs 4.134 – 4.137 of the consultation document.

*Significantly lower shares are indicative of competitive constraints on BT*

We disagree with Ofcom's conclusions and its analysis of market shares because despite there being only one large rival to BT in the RoUK there are quite significant differences in market shares which must demonstrate that Virgin Media is able to provide significant competitive constraints on BT and that there are different competitive conditions at different bandwidths. BT is not the dominant provider in this market and is in no sense the price leader.

Furthermore, BT's service shares in the very high bandwidth market would be even lower in the scenario where we include MNO backhaul but not LLU backhaul in the service share calculation (which Ofcom has failed to provide) – BT estimates that its service share would be approximately 22%, whilst Virgin Media's would be approximately 63%. BT's service shares would also be considerably lower if Ofcom included all DF circuit ends in its market share analysis.<sup>64</sup>

*ROCE figures do not consider the dynamic nature of the market*

Using ROCE above BT's cost of capital as evidence that "*Virgin Media isn't currently constraining BT's prices and profits*"<sup>65</sup> demonstrates problems with a snapshot analysis. To ensure that the analysis is representative of actual competitive conditions Ofcom needs to consider a longer time period, particularly given the highly dynamic nature of the market. Furthermore, Ofcom needs to conduct a detailed analysis of prices for higher bandwidth services in areas where Virgin Media has significant market share.

It is not sufficient for Ofcom to argue that BT may reassert itself in this market because this is pure speculation by Ofcom and cannot be considered as reliable evidence on which to justify regulation. As we outlined above, it is highly unlikely that there will be large changes in the level of competition in areas where very high bandwidth services are currently competitively supplied. Whilst BT might be able to provide very high bandwidth services in a small number of alternative areas and see an increase in its national market share, there will still be competitive supply in some geographic areas.

Ofcom does acknowledge that "*...in the short run OCPs appear to be winning a large share of very high CISBO*", and it states that it "*take[s] this into account when deciding on which remedies are appropriate*."<sup>66</sup> Whilst Ofcom makes this statement there does not appear to be any evidence that it has actually taken this into account when deciding which remedies are appropriate. In actual fact the imposition of the DF remedy has significant implications for competition in high

<sup>64</sup> See section 12 of BT's response to the consultation document.

<sup>65</sup> See paragraph 4.135 of the consultation document.

<sup>66</sup> See paragraph 4.137 of the consultation document.

bandwidth services and it is likely to remove incentives for full infrastructure competition in these areas. As we discuss further in section 2.3 below, the way Ofcom has defined the market, and its apparent dismissal of the low service shares of BT in the very high bandwidth CISBO services, has implications for the designation of SMP and imposition of the DF remedy.

## 2.2 Geographic market

*Ofcom's approach to geographic market analysis is not robust*

The geographic element to understanding competitive conditions for high bandwidth services is particularly important, as the provision of these services tends to be more clustered than lower bandwidth services (for example, around data centres and in central business districts). The approach taken by Ofcom to defining geographic aspects of the market raises many of the same issues that we flagged in 2012 about lack of robustness and arbitrariness in Ofcom's approach to market definition. For example, we demonstrated numerous sources of bias that tended to tip Ofcom's analysis away from finding competitive conditions in the supply of specific services in specific locations:

- Ofcom's use of businesses with over 250 employees as a proxy for demand was not representative of demand from businesses with fewer employees but significant communication demand;
- Ofcom tended to miss clusters of competitive supply due to geographical averaging. This was a bias, as it created a tendency to misidentify competitively supplied areas as uncompetitive, but did not make the countervailing error of misidentifying uncompetitive areas as competitive;
- This bias was further compounded by the requirement of geographical contiguity that Ofcom imposed on areas of competitive supply;
- This bias was more significant for higher bandwidth products where customers are fewer in number and so tend to be more geographically isolated.<sup>67</sup>

In this section we consider the steps Ofcom has taken when determining the geographic market and provide an assessment of the robustness of its findings. We first set out our understanding of

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<sup>67</sup> We covered these issues in a report provided to BT on the 'Economic aspects of Ofcom's proposals in the BCMR', DotEcon, 13 September 2012. Available in Part 2 of BT's response to the June 2012 BCMR Consultation. Available at: [http://stakeholders.ofcom.org.uk/binaries/consultations/business-connectivity/responses/BT\\_part\\_2.pdf](http://stakeholders.ofcom.org.uk/binaries/consultations/business-connectivity/responses/BT_part_2.pdf)

those aspects of Ofcom’s approach to geographic market definition and data analysis that appear to be pivotal to the conclusions it ultimately reaches (as set out in Section 4 and Annex 15, 18 and 21 of the consultation document). We note that the approach to market definition in this case is particularly complex given the great heterogeneity of customers and a large variety of products at different bandwidths for which there may be different levels of competition - actual and potential competition may vary significantly with location.

## 2.2.1 Ofcom’s approach

### *Modified greenfield approach*

As with the product market definition, Ofcom has decided to follow a modified greenfield approach. In this case, Ofcom assumes the absence of any wholesale SMP remedy in the leased lines market. Under these conditions, Ofcom considers that without the ability to source terminating segments from another CP, operators would have to be vertically integrated and there would be no ‘merchant market’ such that retail provision would be met by CPs with their own infrastructure. Therefore, competition at the retail level will only occur where there are multiple CPs with infrastructure in that area. Ofcom considers that only CPs with an existing network in the proximity of customer sites would be able to compete.<sup>68</sup> It is on this assumption that Ofcom establishes its approach to defining market boundaries.

### *Local competition dependent on number of suppliers*

Ofcom first considers what factors promote local competition. It identifies “*the number of suppliers which have a network in that area and are active in the supply of leased lines*” as the ‘key factor’ determining the intensity of competition.<sup>69</sup> Another factor it considers important is the number of businesses demanding leased lines and how concentrated they are.<sup>70</sup>

Ofcom’s approach to market definition is based on local determination of competitive conditions and places “*great weight*” on the presence and density of rival infrastructure. Ofcom also notes that it will only define separate markets where there are “*clear and sustainable*” differences in competitive conditions in that area.<sup>71</sup>

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<sup>68</sup> See paragraphs A21.7 – A21.9

<sup>69</sup> See paragraph A21.12 of the consultation document.

<sup>70</sup> See paragraph A21.14 of the consultation document.

<sup>71</sup> See paragraph A21.36 of the consultation document.

## Setting geographic market boundaries

Ofcom sets geographic market boundaries through a procedure that assesses the distribution of 'flexibility points'<sup>72</sup> of CPs and their proximity to businesses.

*Market boundaries set with reference to postcode sectors*

Using data on UK business locations and postcodes from 'Market Location' data<sup>73</sup> Ofcom assumes that a CP with a flexibility point within a certain 'buffer distance' of that business site was a potential supplier. That buffer distance is determined by Ofcom to be 200m as a basis for determining areas that have potential to be more competitive than the UK overall, and 50-100m to identify areas where competition in the CISBO market is effective.<sup>74</sup>

Ofcom identifies potentially competitive areas in the UK, by considering 'postcode sectors' and determining the network reach in each area.<sup>75</sup> That is the average number of potential suppliers excluding BT for the site within each postcode sector. Areas with on average more than two more OCPs (in addition to BT) are defined as a high network reach areas. Ofcom then considers contiguous high network reach areas in more detail.

*Focus on areas of 'material scale'*

As in the 2013 BCMR, Ofcom focuses on contiguous geographic areas of "material scale" rather than a more fragmented assessment. Ofcom does recognise that the choice of geographic unit involves a trade off between granularity and practicality: "*[a]n assessment of competitive conditions at the level of individual sites would be impractical and disproportionate in terms of data collection and analysis, whereas wider geographic units risk masking large variations in competitive conditions.*"<sup>76</sup> However, it considers that the use of postcode sectors remains appropriate. As competitive conditions will likely be determined over an area larger than a single postcode. Ofcom also places weight on (near) contiguity when defining

<sup>72</sup> Defined by Ofcom as, "...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". See Text box 4.1 of the consultation document.

<sup>73</sup> Ofcom no longer uses Experian data. See paragraph A15.44 of the consultation document.

<sup>74</sup> See Annex 18 of the consultation document.

<sup>75</sup> Ofcom defines 'network reach' as, "...the average number of OCPs with a flexibility point within 200m of the large business sites in a postcode sector. Sectors with network reach value of two or more are then considered "high network reach" sectors." See footnote 265 at Annex 15 of the consultation document.

<sup>76</sup> See paragraph A21.38 of the consultation document.

geographic scope of the market.<sup>77</sup> We note that it is not simply a consideration of granularity and practicality here, but that the answer Ofcom will obtain will depend on the size of the regions it uses. This is because of the averaging and the thresholds it sets. This can make the analysis rather difficult to interpret. Informed by the network reach analysis, Ofcom identified the areas it considered display *potentially* significant differences in the degree of presence and depth of rival infrastructure:

- **“Central London Area (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)**, where in most places there is not any or only one OCP, typically Virgin Media, present.
- Within the RoUK are the **Central Business Districts (CBDs)** of other urban centres, 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.”<sup>78</sup>

Ofcom then proceeds to consider the boundaries of each of these areas by applying a “boundary test” (see Box below).

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<sup>77</sup> Ofcom requires contiguity because, “...investment decisions in leased line markets are often incremental to current network build and because, for an operator to be able to compete across the geographic scope of an unregulated market it must have, or be able to obtain wholesale access to, infrastructure at both ends of the leased line and also any segments in between the two ends. We therefore considered that competitive market areas would tend to be contiguous.” See paragraph 15.173 of the consultation document.

<sup>78</sup> See paragraph 4.87 of the consultation document.

**The boundary test**

Beginning with the CLA, Ofcom considers that the boundary will be formed by:

- *“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.”<sup>79</sup>*

Ofcom justifies its choice of a requirement for average network reach of five OCPs (i.e BT plus 5 others), or BT plus 4 OCPs in the 90% case, on the basis that this allows for at least two competing offers on average even if the customer needs to contract with two CPs for resilience purposes, increases the likelihood that BT is constrained by competition, and minimises the risk of tacit collusion.

Ofcom’s requirement that 90% of business sites be located within the buffer distance of at least 2 OCPs (the 90% test) *“[a]llows for the possibility that an average measure may not be representative of competitive conditions at all business sites” and “[a]s 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).”<sup>80</sup>*

Ofcom’s approach is not dissimilar to that applied in the 2014 WBA-Statement, however, the conditions here appear to be stricter. For example in the WBA, Ofcom’s geographic market definition is based on a consideration of exchanges where there is BT plus a set number of other ‘Principle Operators’ (PO) are present. Exchanges where there are BT plus three or more POs are grouped together, exchanges where BT+2 exchanges are found to have similar competitive conditions to BT+3 or more PO exchanges and are also included in the same relevant geographic market.<sup>81</sup> The thresholds for the WBA market are more consistent with looking for SMP (i.e. BT+1 is likely to lead to >50% market share, so presumption of dominance). However, in the BCMR, a requirement for 5 or more CPs within a buffer distance of 100m seems like a very high threshold. It is really not clear why this is the correct test for determining if there is SMP.

<sup>79</sup> See paragraph 4.91 of the consultation document.

<sup>80</sup> See paragraph 4.94 of the consultation document.

<sup>81</sup> Note that Ofcom no longer distinguish between BT-only and BT+1 exchanges and these are in the same geographic market as each other. See Ofcom, 26 June 2014, Review of the wholesale broadband access markets Final Statement.

*Central London Area*

For **CLA**, Ofcom finds that *“Postcode sectors passing either one of the conditions of the boundary test represent the area in central London where market conditions are likely to be the most competitive. As a result, these sectors form the basis for the relevant geographic market called the Central London Area”*<sup>82</sup> We note that for this geographic area, Ofcom also performed a sensitivity analysis by considering a less strict version of the boundary test and a stricter version of the test, concluding that this did not alter its choice of boundary.<sup>83</sup>

Ofcom also includes within the CLA boundary, postcode sectors that do not meet the above criteria themselves, but are largely surrounded by postcode areas that do. Ofcom identifies 11 postcode sectors that did not pass the two conditions, but considered that they came very close to satisfying at least one of the conditions and they are contiguous with (and mostly surrounded by) sectors that pass the boundary test.<sup>84</sup>

This includes non-contiguous areas in Kensington and Docklands as they have *“strong economic and physical links to the main block of CLA sectors”*.<sup>85</sup> Ofcom note that contiguity is important and refer back to their 2013 statement: *“We required contiguity because investment decisions in leased line markets are often incremental to current network build and because, for an operator to be able to compete across the geographic scope of an unregulated market it must have, or be able to obtain wholesale access to, infrastructure at both ends of the leased line and also any segments in between the two ends.”*<sup>86</sup> Within the CLA boundary, Ofcom identifies one large and two smaller contiguous blocks. In each case, the two small blocks are separated from the large block by a single postcode sector. Ofcom considers that: *“...economic linkages between the three contiguous blocks are likely to be strong... we think it reasonable to include these three blocks in the CLA market.”*<sup>87</sup>

*London Periphery*

For the **LP**, the inner boundary is defined as the boundary of CLA and the outer boundary correspond to that of the 2013 WECLA.<sup>88</sup>

<sup>82</sup> See paragraph A15.167 of the consultation document.

<sup>83</sup> See paragraphs A15.176-A15.179 of the consultation document.

<sup>84</sup> See paragraph A15.169 consultation document.

<sup>85</sup> See paragraph 4.95 consultation document.

<sup>86</sup> See paragraph A15.173 consultation document.

<sup>87</sup> See paragraph A15.175 consultation document.

<sup>88</sup> See paragraph 4.98 of the consultation document: *“...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.”*

### Central Business Districts

For each of the **Central Business Districts** (i.e. blocks of contiguous postcode sectors with a network reach of two or greater in the five metro areas of Birmingham, Bristol, Glasgow, Leeds and Manchester), Ofcom applies the same boundary test. Ofcom finds only very few sectors that passed either one of the conditions defined by the boundary test.<sup>89</sup>

## Assessment of competition in these areas

Ofcom then proceeds to conduct its assessment of competition in and across these geographic areas. Whilst Ofcom considers that rival infrastructure is the main determinant of competition locally, it considers a wider set of evidence to determine competitive conditions:

- **Presence of rival infrastructure** – based on proximity of rival networks (identifying postcode sectors where on average businesses have two network (in addition to BT) located within 200m as a way to identify sectors and areas with potential for competition, and the number of OCPs within 50m-100m in order to identify geographic area where the CISBO market at all bandwidths is effectively competitive); and the number of rival networks and their coverage (measuring “the average number of OCPs available to businesses in a postcode sector” but recognising that “...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.”<sup>90</sup>);
- **Distribution of service shares** - “Service shares provide a potential indication of the extent to which presence of rival infrastructure has translated into competition for supply of CISBO services.” However, Ofcom do acknowledge that “...although service shares for CISBO segments vary by geographic location, in particular for cities outside London, variations need to be interpreted cautiously as the number of circuits can be very small.”<sup>91</sup>

<sup>89</sup> See paragraph A15.181-A5.181 and table A15.17 of the consultation document.

<sup>90</sup> See paragraph 4.103 of the consultation document. Note that Ofcom also considers, “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.” (paragraph 4.105)

<sup>91</sup> See paragraph 4.108 of the consultation document

- **Pricing and profits** – on the assumption that differences in prices and profitability between different areas may reflect differences in the intensity of competition.
- **Other structural indicators of competition** – “...such as the overall size and density of demand and the nature of businesses within a particular geographic area...[and] the economic and physical interactions between one area and neighbouring areas.”<sup>92</sup>

A summary of the evidence for each of these items and in each of the potential areas is provided in Table 4.4 of the consultation document. In short, Ofcom finds the following:

- **Presence of rival infrastructure** – for CLA: “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.” For RoUK: “rival infrastructure is very limited” and in LP and CBDs: “the extent of rival infrastructure, whilst considerably greater than in the RoUK, is significantly lower than in the CLA”. Ofcom conclude that the CLA is clearly different in terms of presence of rival infrastructure and that presence of rival infrastructure in LP and CBDs “points to different competitive conditions in these areas, with density of rival infrastructure significantly greater than in most of the RoUK.”<sup>93</sup>
- **Distribution of service shares** – Ofcom considers shares in each area for Total CISBO, CISBO up to and including 1Gbit/s, Very high CISBO, and Low bandwidth CISBO. Ofcom finds that “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.”<sup>94</sup>
- **Pricing and profits** - Prices for CISBO up to 1Gbit/s are uniform (however, caution is necessary when considering competitive conditions given that these services are subject to regulation). However, “pricing of very high CISBO services points to competitive conditions in the CLA and possibly the LP being different from those in other geographic areas.”<sup>95</sup>
- **Other structural indicators** – “The number of businesses and the demand for leased lines and, in particular, very high value

<sup>92</sup> See paragraph 4.111 of the consultation document.

<sup>93</sup> See paragraphs 4.114 – 4.116 of the consultation document.

<sup>94</sup> See paragraphs 4.117 – 4.118 of the consultation document.

<sup>95</sup> See paragraphs 4.119 – 4.120 of the consultation document.

*services are much greater in the CLA than in other areas, and we consider that this is likely to continue to have a positive effect on the extent to which CPs have been and will continue to compete for supply of CISBO in the CLA.” For LP and CBDs Ofcom considers that “...LP differs from the CBDs in that business density is greater in the LP”<sup>96</sup>*

*Competition is strong in CLA*

Following its review of the competitive conditions, Ofcom considers that there are sufficient differences in the presence and density of rival infrastructure to indicate different competitive conditions between the CLA, the LP, CBDs and the RoUK. It finds the competitive conditions for the supply of CISBO to be most favourable in CLA.

*CBDs not a separate market*

However, despite finding many conditions similar to the CLA (in some cases) and the LP (in most cases), Ofcom does not consider the need to define the CBDs as a different market. The main reasons for this, as stated by Ofcom, include:

- *“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 of (potential) demand being greater in the LP.*
- *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...*
- *... 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.”<sup>97</sup>*

Note that Ofcom’s reasoning for not defining CBDs as a separate market here is not particularly robust. Whilst we acknowledge that there may be variation between the CBDs and that not all CBDs may be competitive, it strains credibility to believe that there are no areas of these CBDs where businesses are competitively supplied, and thus one cannot ignore all CBDs completely.

*Ofcom’s market definition*

Nevertheless, following its assessment, Ofcom defines the following distinct markets:

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

<sup>96</sup> See paragraphs 4.121 – 4.122 of the consultation document.

<sup>97</sup> See paragraph 4.124-4.125 of the consultation document.

- A single product market for Contemporary Interface Symmetric Broadband Origination services in the London Periphery (LP);
- A single product market for Contemporary Interface Symmetric Broadband Origination services in the Rest of UK (RoUK).

*Ofcom's position on market power*

Having taken this approach to market definition, Ofcom assesses market power in the relevant markets and Ofcom proposes the following SMP findings in the relevant markets:

- Market for CISBO services in CLA (finding no CP to have SMP);
- Market for CISBO services in the LP (finding BT to have SMP); and
- Market for CISBO services in RoUK excluding Hull (finding BT to have SMP).

Based on its competitive assessment, Ofcom proposes to impose DF remedies (DF) in all non-competitive areas, which includes LP and RoUK (including CBDs).<sup>98</sup>

## 2.2.2 Our assessment of Ofcom's approach to geographic market definition

*There will be interactions between the product market and geographic market assessment*

Before considering some of the specific assumptions imposed by Ofcom in its analysis, we first stress that the question of geography changes at higher bandwidths such that product market definition and geographic market definition cannot be assessed independently. Incentives to build to a customer become stronger for higher bandwidth services. Furthermore, customers with high bandwidth requirements may be clustered within business districts therefore it is highly probable that competitive supply of high bandwidth services will also vary by geography i.e. be clustered in particular regions.

There are examples of NRAs defining separate geographic markets on the basis of the different competitive conditions faced in the provision of high and low bandwidth services. For example, when the Austrian regulator RTR submitted a revised draft measure, (see box below) it split the market between high and low bandwidth services. In contrast to the low bandwidth market, which was deemed to be national, RTR found that for the higher bandwidth services the market could be split further into two geographic

<sup>98</sup> See paragraph 9.1 of the consultation document.

markets because competition for higher bandwidth services was not heterogeneous across the national market (see Box below for further detail).

Defining a wholesale market for terminating segments of leased lines with speeds higher than 2 Mbit/s (including dark fibre ends) within 359 communes (market 1), RTR concluded that despite there continuing to be high barriers to entry *“this market is characterised with a tendency towards effective competition, which led it to conclude that ex ante regulation is no longer warranted for this market.”*<sup>99</sup>

Unlike Ofcom, RTR did not require communes to be contiguous but rather that both ends of the leased line had to be within the commune for it to be included in market 1.<sup>100</sup> Furthermore, it did not require homogenous competitive conditions across the communes included in market 1 as long as they met the minimum criteria for inclusion. The conditions for aggregating individual communes together are also much less restrictive than those set out in Ofcom’s ‘boundary test’. RTR’s geographic market definition was adopted in its Final Decision and it deregulated market 1.<sup>101</sup>

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<sup>99</sup> European Commission, 6 June 2014, “Commission Decision concerning Case AT/2014/1599: Wholesale terminating segments of leased lines in Austria, Comments pursuant to Article 7(3) of Directive 2002/21/EC”, C(2014) 3966 final, p 5.

<sup>100</sup> “According to TKK/RTR only those leased lines where both ends are sold in the same commune can be attributed to Market 1.” European Commission, 6 June 2014, “Commission Decision concerning Case AT/2014/1599: Wholesale terminating segments of leased lines in Austria, Comments pursuant to Article 7(3) of Directive 2002/21/EC”, C(2014) 3966 final, p 4.

<sup>101</sup> See sections 1.3, 1.4 and 2.3 of RTR, 28 July 2014, Decision, M 1.5/2012-135. Available at: [https://www.rtr.at/de/tk/M\\_1\\_5\\_12](https://www.rtr.at/de/tk/M_1_5_12)

**Austrian regulator's (RTR's) analysis of geographic market definition in high bandwidth services in revised draft measure and Final Decision**

*"For the lower speed segment TKK/RTR concluded that competitive conditions are homogeneous across the national territory of Austria. With regards to the higher speed segment, however, TKK/RTR now conducted an improved geographic market analysis assessing the competitive conditions in approximately 2350 local communes ("Gemeinden"). In doing so TKK/RTR applied the following criteria when aggregating individual communes together for its geographic market definition (for bandwidths above 2 Mbit/s):*

- (i) At least 2 terminating segments/ends (based on own infrastructure) are leased;*
- (ii) At least two operators (incl. A1 Telekom Austria) offer Ethernet services and leased lines based on their own infrastructure; and*
- (iii) the market share of A1 Telekom Austria (based on the number of ends in the commune) is below 40%.*

*If all three criteria above are met, a commune will be in Market 1. All other communes will be part of Market 2. TKK/RTR concluded that for a set of 359 communes the competitive conditions were sufficiently heterogeneous from the rest of the country to justify the definition of a distinct geographic market."<sup>102</sup>*

In its Final Decision RTR also considered entry barriers and potential competition in markets 1 and 2.<sup>103</sup> Whilst acknowledging that some barriers to entry were evident in market 1, RTR concluded that the presence of at least one operator with its own infrastructure, which several large buyers deemed as a credible alternative to A1 Telekom, meant that there was effective competition in market 1. It therefore concluded that market 1 did not meet the criteria laid out in "three criteria tests" and decided to withdraw ex-ante regulation in market 1.<sup>104</sup>

There are a number of issues with Ofcom's approach to market definition and competitive assessment. Ofcom's method for measuring local competition and identifying an area of alleged competitive supply – based on an average count of nearby suppliers in a geographical area – is not reliable and is potentially biased. We outline some of our concerns below.

<sup>102</sup> European Commission, 6 June 2014, "Commission Decision concerning Case AT/2014/1599: Wholesale terminating segments of leased lines in Austria, Comments pursuant to Article 7(3) of Directive 2002/21/EC", C(2014) 3966 final, p 4.

<sup>103</sup> See section 2.2 of RTR, 28 July 2014, Decision, M 1.5/2012-135. Available at: [https://www.rtr.at/de/tk/M\\_1\\_5\\_12](https://www.rtr.at/de/tk/M_1_5_12)

<sup>104</sup> See section 2.3 of RTR, 28 July 2014, Decision, M 1.5/2012-135. Available at: [https://www.rtr.at/de/tk/M\\_1\\_5\\_12](https://www.rtr.at/de/tk/M_1_5_12)

*Modified greenfield approach*

We acknowledge that Ofcom's choice to adopt a modified greenfield approach is consistent with the BEREC common position on geographic aspects of competition.<sup>105</sup> BEREC comment that *"wholesale markets positioned higher in the vertical value chain should be analysed first, and only once the regulation (if any) imposed (or to be imposed) on these markets has been taken into account should the SMP analysis be performed in markets lower down the value chain"*. Furthermore, it states that the two markets can be reviewed together provided the outcome of the analysis of *"the higher market"* is factored into the market operating downstream<sup>106</sup> - *"Following this logic, it can also be concluded that if, in the absence of regulation, there are no problems identified at the retail level, there is, in principle, no need to intervene in the related wholesale market(s)"*<sup>107</sup>

*Circular nature of Ofcom's 'no merchant market' assumption*

Whilst the assumptions imposed by Ofcom are in line with the guidance, it has not fully captured the likelihood of competition in the absence of regulation. As part of Ofcom's 'modified greenfield' approach, it assumes that there will be no 'merchant market' such that retail provision would only be met by CPs using their own infrastructure and hence this is why it focuses on the number of CPs with their own infrastructure for its geographic market definition. However, in areas where BT faces infrastructure competition, the 'no merchant market' assumption may not hold true, and in the hypothetical case, BT, or other CPs, may offer wholesale access as a further way to compete against each other.<sup>108</sup> Therefore, the extent to which the 'no merchant market' assumption holds true will vary by geography and as such, Ofcom's approach is circular in nature.

*Considering only current network footprints will understate likely competition*

Furthermore, an analysis based on current network footprints will tend to understate competition in a greenfield scenario. In the absence of regulation in this market (i.e. imposing the greenfield market assumptions), incentives for network rollout are likely to be stronger than under a scenario where regulated wholesale products are available to extend network reach. Therefore, not only is the

<sup>105</sup> BEREC Common Position on geographic aspects of market analysis (definition and remedies), BoR(14)73, 5 June 2014. Available at: [http://berec.europa.eu/eng/document\\_register/subject\\_matter/berec/regulatory\\_best\\_practices/common\\_approaches\\_positions/4439-berec-common-position-on-geographic-aspects-of-market-analysis-definition-and-remedies](http://berec.europa.eu/eng/document_register/subject_matter/berec/regulatory_best_practices/common_approaches_positions/4439-berec-common-position-on-geographic-aspects-of-market-analysis-definition-and-remedies)

<sup>106</sup> See paragraph 71 of the BEREC Common Position on geographic aspects of market analysis (definition and remedies), BoR(14)73, 5 June 2014.

<sup>107</sup> See paragraph 72 of BEREC Common Position on geographic aspects of market analysis (definition and remedies), BoR(14)73, 5 June 2014.

<sup>108</sup> In the 2013 BCMR Statement Ofcom provided evidence of actual merchant market transactions and showed that *"insurmountable barriers to an OCP merchant market do not exist."* For example see Table 5.28, Figure 5.32, Table 5.39 and Figure 5.45 showing (OCPs merchant market transactions in the MB TISBO, HB TISBO, AISBO and MISBO market respectively.

actual, existing level of competition (as considered by Ofcom through its network reach analysis and the presence of rival infrastructure at present) important, but one must also consider the likely emergence of competition between network providers building out their own infrastructure and the extension of footprints that might result if BT made a hypothetical, significant and nontransitory increase in wholesale prices. This is not captured in Ofcom's analysis.

Indeed, BEREC outlines the need to examine the retail market in detail, including a detailed consideration of the importance and scope of self-supply for these markets including competitive analysis, strength of indirect constraints and the decision to incorporate self-supplied services.<sup>109</sup>

*Endogenous location decisions*

Ofcom has failed to take into account the fact that the location decisions of businesses seeking high bandwidth services is endogenous to the supply of competitive services. Businesses and data centres are highly likely to make their location choice based on the presence of a number of suppliers of high bandwidth services. Whilst Ofcom do mention bandwidth influencing the choice of site selection – *“There may be some retail customers – for example, data centres or small media companies – for whom the availability of multiple network providers is of greater importance, up to the point of it being an important criterion of site selection”*<sup>110</sup> - it is not clear that they have actually factored this in to their approach to market definition. The reason for not doing so seems to be because Ofcom considers that once these customers *“have invested in a particular location they will be unlikely to relocate to another area”*.<sup>111</sup> However, this does not change the fact that the initial decision to locate was endogenous to the supply of competitive services, whether or not they are likely to move after locating does not alter that decision.

*Choice of geographical unit of analysis*

Ofcom's approach counts CPs (in addition to BT) with flexibility points within 200m (or 100m for CLA) of a customer site and then averages this count across the postcode sector. Where there are on average two or more operators in addition to BT, the postcode sector is characterised as having “high network reach”. However, the use of postcode-sectors and an arbitrary buffer distance may not provide an accurate view of competition in each area.

<sup>109</sup> See paragraph 74 of the BEREC Common Position on geographic aspects of market analysis (definition and remedies), BoR(14)73, 5 June 2014.

<sup>110</sup> See paragraph A21.18 of the consultation document.

<sup>111</sup> See paragraph A21.18 of the consultation document.

*Use of postcode sectors*

A primary issue is that Ofcom's findings are heavily dependent on the geographical scaling used in its underlying analysis. Ofcom has noted a trade-off between granularity and practicality,<sup>112</sup> but this understates the importance of the choice of geographical unit on the conclusions. Ofcom has used postcode sectors for its analysis, but postcodes are highly variable in size. If a postcode is particularly large, then any view of competition based on averaging of users over the area will provide distorted results.

By changing the scale of the areas there could be distinctly different outcomes (due to the non-convexities inherent in the approach that is applied). To see why, consider the nature of this market in which competitively supplied customers are necessarily clustered. Given one competitively supplied customer, any other sufficiently nearby customer must necessarily also be competitively supplied. If competitively supplied customers are clustered, the geographical areas over which an average of the nearby supplier count is computed is critical. The average of numbers of suppliers within a given build distance is a poor metric unless the geographical area over which averaging occurs is sufficiently small. There is no guarantee that relying on postcode sectors that vary in size is sensible or reliable without conducting any sensitivity analysis.

*Dig distance*

Relying too heavily on a fixed 'dig distance' assumption may be unreliable as this does not take into account differing incentives to dig. Whilst Ofcom acknowledge that in some cases a 100m dig distance may overstate the distance a CP may consider when extending their network,<sup>113</sup> there are also reasons why a CP may be willing to dig significantly further. We maintain that by using a short dig distance Ofcom may be missing competitively supplied/prospectively competitive areas where high value businesses are located (i.e. those demanding high bandwidth services) and clustered, because operators are more likely to dig further to meet the demands of these customers. Furthermore, Ofcom's methodology might miss competitively served customers unless the geographic unit was sufficiently small i.e. a postcode sector could be classified as low network reach but there could be customers within the postcode sector that have high network reach. In some cases, Ofcom is now also considering even shorter dig distances of just 100m in some cases.

*Contiguity requirements*

Ofcom goes on to compound this problem of sensitivity to the choice of the scale of geographical areas on which "high network reach" is assessed by imposing a further requirement that high network reach areas should be contiguous with other such areas.

<sup>112</sup> See paragraph A21.38 of the consultation document.

<sup>113</sup> See paragraph 4.103(b) of the consultation document.

The requirements for contiguity of competitive postcode sectors may mean that competitively supplied areas are misidentified as uncompetitive and Ofcom does not seem to make any adjustments to correct for this. For example, through its approach, Ofcom fails to identify clusters of competitive supply such as science or business parks, which may be located outside of central business districts. However, Ofcom does comment 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”*.<sup>114</sup>

#### Dismissal of CBDs

We are concerned about Ofcom’s consideration of Central Business Districts (‘CBDs’) in the analysis. Whilst we welcome the fact that Ofcom has acknowledged that there are different competitive conditions in CBDs relative to the rest of UK (‘RoUK’), Ofcom’s reasoning for not defining these as separate geographic markets is far from satisfactory and again muddies understanding of the competition conditions for high bandwidth services. For example, at paragraph 4.125 of the consultation Ofcom suggests that the heterogeneity between different CBDs would not justify a single geographic grouping, simply concluding that CBDs should be included in the RoUK market. Further, when considering network reach in the CBDs Ofcom does not conduct a sensitivity analysis (as it does when analysing CLA).

Ofcom’s choice not to define a separate market for CBDs appears to be motivated (at least in part) due to the fact that each CBD covers small areas and there are variations between them. Ofcom may consider this to be consistent with the BEREC Common Position on geographic aspects of market analysis, insofar as that outlines, *“[w]ith a large number of small areas, however, there is likely to be a continuum of competitive conditions, so it will usually be difficult to draw a clear line between more and less competitive areas.”*<sup>115</sup> However, while Ofcom do not propose to define a separate geographic market for CBDs, it recognises that competitive conditions in CBDs are different for the RoUK.<sup>116</sup> The BEREC Common Position states that *“...areas should be aggregated such that competitive conditions within a market are sufficiently homogenous whereas competitive conditions differ between markets with potential effects on either the SMP finding or the identified*

<sup>114</sup> See footnote 100 on page 63 of the consultation document.

<sup>115</sup> See paragraph 129 of the BEREC Common Position on geographic aspects of market analysis (definition and remedies), BoR(14)73, 5 June 2014.

<sup>116</sup> See paragraph 4.125 and 4.165 of the consultation document.

*competition problems*".<sup>117</sup> Difficulty in drawing dividing lines does not mean that no line should be drawn.

Although in its market power assessment, Ofcom explains why it would find BT to have SMP even if it had defined a separate geographic market,<sup>118</sup> one must recall that this SMP assessment is taken over the entire CBD area. It strains credibility to believe that there are no areas of Birmingham, Edinburgh or Bristol where businesses are competitively supplied. If Ofcom was able to identify smaller areas or clusters of competitive supply then it may be sufficient to remove regulation (or apply differentiated regulation) in these areas. This would further limit the risks that the introduction of passive remedies in competitive or prospectively competitive areas would undermine investment incentives and the case for full infrastructure competition.

This approach could be justified as the BEREC common position supports an alternative approach where it is likely that there may be small areas of competitive supply. For example, it considers that the NRA could proceed with a wider or single geographic market, but with differentiated remedies within that market deemed to be appropriate when areas are not sufficiently stable or competitive conditions were not sustainable enough to justify the definition of subnational markets.<sup>119</sup>

*Why does Ofcom's data centre approach, not apply to CBDs?*

We do recognise that Ofcom has done some additional analysis to identify candidate competitive exchanges and candidate data centres that are being used by CPs as part of competitive core networks. This analysis is conducted as part of Ofcom's identification of the boundary between (non competitive) terminating segments and (competitive) core/trunk networks. For example, Ofcom identifies 60 candidate competitive data centres that satisfy the following criteria: the data centre is carrier neutral; it has at least two routes to other carrier neutral data centres; and at least two of these routes are contested by two or more OCPs.<sup>120</sup> Ofcom does "*remove some connections from the regulated sphere*", proposing that "*...links between the candidate nodes would form part of the competitive CI core market and, hence, would fall outside the*

<sup>117</sup> See paragraph 129 of the BEREC Common Position on geographic aspects of market analysis (definition and remedies), BoR(14)73, 5 June 2014.

<sup>118</sup> See paragraph 4.165 onward of the consultation document.

<sup>119</sup> For example see paragraph 38 and paragraph 6 of the BEREC Common Position on geographic aspects of market analysis (definition and remedies), BoR(14)73, 5 June 2014

<sup>120</sup> See paragraph A20.69 of the consultation document.

*CISBO market. No CP would be found to have SMP in the relevant CI core market.”<sup>121</sup>*

Why has Ofcom not considered something similar for those smaller areas of competitive supply with the Central Business Districts, that may not otherwise pass Ofcom’s tests of sufficient infrastructure competition over contiguous post-code sectors to warrant a distinct and separate geographic market?

Ofcom’s restrictions such as its boundary test, use of postcode sectors, dig distance choice and contiguity requirements result in a number of biases that make it difficult for it to identify small clusters of competition in areas outside of CLA. Even in the case where it has identified around 53,300 business sites with high network reach, Ofcom proposes to only deregulate in the CLA where there are around 4300 business sites – a very small proportion.<sup>122</sup>

## 2.3 Impact of market definition for Dark Fibre remedies

Ofcom’s market definition has worrying consequences for its competitive assessment, as there are systematic and cumulative biases in the view of higher bandwidth services that result from both the single product market and the approach to geographic market definition.

*Ofcom’s approach will not identify clusters of competitive supply*

The way in which Ofcom seeks to identify areas of competitive supply necessarily tend to miss clusters of competitive supply. This is a bias, as it creates a tendency to misidentify competitively supplied area as uncompetitive, but does not make the countervailing error of misidentifying uncompetitive areas as competitive. Given that such clusters of competitive supply will disproportionately be in areas where there are businesses with demand for high bandwidth services, we contest that this bias is more acute for higher bandwidth products i.e. those more likely to be substitutable for DF. Although these areas may only be small, they are likely to be high value and represent an important growth area, therefore they should not be dismissed.

*Biases should be accounted for*

Where there are biases, measurement methods either need to be refined to reduce these problems, or else the biases acknowledged when interpreting results and drawing conclusions. Ofcom does not appear to have made any major allowances for these potential

<sup>121</sup> See paragraph 4.206 of the consultation document.

<sup>122</sup> See Table A15.8 and Table 4.4 of the consultation document.

biases/errors and its SMP assessment is based on its market definition in which it decided not to recognise small areas of potentially competitive supply such as CBDs. Of course, the misidentification of competitive or potentially competitive areas of supply as uncompetitive will likely have consequences for investment incentives and the build-buy decisions of CPs as a result of the imposition of remedies including DF.

There is a particular likelihood that DF will be attractive in geographic areas with existing or emergent infrastructure-based competition (and in expansion areas) that the introduction of passive access could distort investment incentives and limit the potential benefits from full infrastructure competition that would otherwise materialise. Even in the best case, there is likely to be some uncertainty and ambiguity over the definition of geographical markets that is unavoidable that will inevitably interact with any passive remedy to undermine incentives for infrastructure investment at least at the boundaries of competitive supply areas; impacts may be much wider if competitive supply areas are defined too narrowly.

*Misidentifying the level of competition is a function of Ofcom's sequential approach to product and geographic market definition*

The potential to misidentify the level of competition in the defined markets can be expected to follow from the fact that Ofcom has failed to appreciate the full extent of the interaction between product and geographic market definition and that substitution possibilities might vary by locality. This has significant practical implications both for CISBO and, in particular very high CISBO services, which includes services with potentially very different incentives to supply and so potentially very different competitive conditions at specific locations. For example, there may be clusters of businesses outside of CLA demanding high bandwidth services and where there are strong incentives for competitive supply in these areas.

Recognising that there is some heterogeneity between customer types and location is important – the demand of different customer types are likely to vary significantly by location. As acknowledged by BEREC in its common position on geographical aspects of market definition, the NRA should recognise that the goal of identifying homogeneity of competitive conditions within each relevant geographical unit should apply to all identifiable consumer groups, and that “[i]ncluding all customer segments in the same geographical unit may not reflect the real competitive constraints faced by the incumbent operator”.<sup>123</sup> However, the consequence of Ofcom’s assessment is that services with quite different demand (and supply) conditions are included within the CISBO market. A

<sup>123</sup> See paragraph 97 of the BEREC Common Position on geographic aspects of market analysis (definition and remedies), BoR(14)73, 5 June 2014

consumer of a 1Gbit/s CI service is likely be very different, and paying a different amount, to a consumer of a 10Mbit/s (or less) service. Incentives to build out to these customers will differ correspondingly. Therefore, once we consider geography, it is difficult to see that competitive conditions are necessarily similar at all locations at the two ends of the bandwidth spectrum.

*An accurate view of competitive conditions is important for imposition of remedies*

As a result, the CISBO product market definition may be too broad to allow proper consideration of how local competitive conditions might vary. Without an appropriate view of the competitive situation for high bandwidth services, Ofcom cannot make an informed view about the introduction of remedies, including DF, as this issue is material to the assessment of the benefits.

Defining a single product market for all CISBO services is particularly relevant to the question of the DF remedy, as conflating all bandwidths into a single market leads to averaged market shares and masks the fact that BT's market share in higher bandwidth active services – the closest substitutes to a DF product – are relatively low. As a result, Ofcom continues to define high bandwidth services as uncompetitive despite BT's low market shares on these services (and the dynamism evident from the speed with which these shares appear to have fallen).

However, as we discussed above, even if Ofcom does decide to proceed with an over-simplified market definition, there is the option for differentiated remedies to reflect different conditions of competition.

## 3 The introduction of passive remedies

*Ofcom must demonstrate that the introduction of passives is net-beneficial*

Having defined the market and identified SMP, Ofcom must then consider the introduction of specific remedies. Previously Ofcom has chosen to implement active remedies in the Business Connectivity Market, however, in this review Ofcom is considering the introduction of remedies in the form of passive access.

At the time of our January 2015 report,<sup>124</sup> we made it clear that Ofcom faced a significant burden of proof to justify the introduction of passive remedies, given that a sufficiently certain net-benefit must be proven to demonstrate that this would necessarily lead to better outcomes than under an alternative regime. We provided a framework for assessment, outlining the key factors Ofcom would need to consider. Ofcom's interventions should be *"evidence-based, proportionate, consistent, accountable and transparent in both deliberation and outcome"* and it should *"seek the least intrusive regulatory mechanisms to achieve its policy objectives."*<sup>125</sup>

Given that many of the costs and benefits are dependent on the exact nature of the passive remedy. We stressed the need for Ofcom to define the exact nature of the passive remedy being proposed including:

- the form of passive remedies (i.e. Duct Access or DF);
- the pricing of the passive access service including how the prices for passive access remedies will be calculated and the pricing structure;
- the geographical scope of the remedy including how it would seek to offer passive access only in SMP areas and how it would deal with cases where BT is deemed to have SMP for certain product markets within geographic markets deemed to be largely competitive; and
- any assumptions about actives – given that passives would be imposed alongside actives for some time, Ofcom should be clear about whether the active access remedies would remain the same or what changes would be made.

In this context, Ofcom would need to:

<sup>124</sup> See DotEcon, Business Connectivity Market Review: Passive Remedies. Submitted as an Annex to BT's response to the November Consultation. Available at: [http://stakeholders.ofcom.org.uk/binaries/consultations/bcmr-passives/responses/BT\\_Annex\\_6.pdf](http://stakeholders.ofcom.org.uk/binaries/consultations/bcmr-passives/responses/BT_Annex_6.pdf)

<sup>125</sup> See Ofcom's Regulatory Principles, available at: <http://www.ofcom.org.uk/about/what-is-ofcom/statutory-duties-and-regulatory-principles/>

- establish the costs, the benefits, the key trade-offs and dynamic interactions;
- apply weights accordingly (varying depending of the level of uncertainty and whether the impact is likely to occur in the short or long term);
- quantify the costs and benefits where possible, or provide as much transparency in argumentation as possible to show that passives are net-welfare enhancing; and
- show that the proposed package of remedies is the best form of intervention to address the competition issues identified.

In this consultation, Ofcom has provided more detailed proposals than it did in the November consultation; recognising that the specifics of the passive remedy will influence the scale and scope of the costs and benefits. However, Ofcom's assessment relies on a number of unfounded assumptions and assertions and lacks evidence to support its arguments, especially in relation to the benefits. Further, we maintain that Ofcom has not specified a clear trade-off framework in which to assess these costs and benefits.

### 3.1 Overview of Ofcom's approach

In section 7 of the consultation document, Ofcom outlines the approach to assessing the likely impact of introducing passive remedies, outlining the structure of its arguments. Before beginning its assessment, Ofcom notes some important points, acknowledging that BT and CPs would need time to adjust to any changes and that any passives remedies would need to co-exist with active remedies for at least this review period, and as such, its assessment of passives must take place in the context of the existing active access regime.<sup>126</sup>

Ofcom considers the potential benefits of passives to include:

- greater scope for innovation and differentiation of services;
- opportunities to reduce duplication of equipment thus reducing overall equipment costs; and
- simplify regulation on the long term by reducing the need to impose active remedies.<sup>127</sup>

*Passive remedies can offer substantial benefits relative to active remedies*

<sup>126</sup> See paragraphs 7.36 – 7.38 of the consultation document.

<sup>127</sup> See paragraph 7.41 of the consultation document.

Ofcom also outline some additional benefits regulated duct access could offer over DF.<sup>128</sup> However, it recognises that duct access poses greater risks and will be more difficult to implement.

*Imposing passive remedies would also carry substantial risk*

Ofcom outline the risks associated with imposing passive remedies, and do so in the context of co-existence of passive remedies with the **current** active regime.

Summarising its findings (the detail of which we consider in Annex A and B of this report), Ofcom considers that a package of remedies including passives can offer “*substantial benefits*” relative to active remedies only.<sup>129</sup> Although recognising a “*substantial risk*” associated with the imposition of passives, Ofcom considers that “*the pricing of passive access would determine the balance between benefits and risks*”.<sup>130</sup> Ofcom’s conclusions are outlined in Table 7.1 of the consultation (and reproduced below)

*Table 1 Ofcom's summary of the impacts and risks of introducing passive remedies*

**Table 7.1: Summary of the impacts and risks of introducing passive remedies**

	Description	Scale and scope of risk
<b>Dynamic efficiency</b>	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.
<b>Allocative efficiency and distributional impacts</b>	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.
<b>Productive efficiency</b>	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.
<b>Structure of competition in the market</b>	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.
<b>Implementation costs</b>	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. <sup>201</sup>

<sup>128</sup> See paragraph 7.44 of the consultation document.

<sup>129</sup> See paragraph 7.39 of the consultation document.

<sup>130</sup> See paragraph 7.39 of the consultation document.

Ofcom discounts 'implementation costs' on the basis that they are unlikely to be significant (as it would allow for the recovery of efficiently incurred implementation costs), and assert that dynamic, allocative and productive efficiency impacts are dependent on the design of the remedy. In the case of allocative and productive efficiency, Ofcom considers that these risks will likely be mitigated by the design and setting prices 'appropriately'.

This is a recurring presumption and when assessing how it would manage the risks associated with introducing dark fibre remedies - Ofcom suggests that many of the risks can be mitigated by the *appropriate* design and pricing of the passive remedy.

*The balance between benefits and risks would be determined by the type of passive access and by the approach to pricing.*

Ofcom correctly identifies that "[t]he 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",<sup>131</sup> and proceeds to determine how it could set prices for passive access in such a way to mitigate the identified risks associated with the introduction of passive remedies.

The main issues Ofcom considers (and its main conclusions on those issues) include:

- addressing risks of inefficient entry – *"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";*<sup>132</sup>
- addressing the risk of undermining BT's investment incentives – *"In the case of a dark fibre remedy, we consider that we could minimise the risk of undermining BT's investment incentives by ... tak[ing] 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";*<sup>133</sup>
- mitigating the risks of undermining other CPs' incentives to invest in 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... if BT reduces its charges for some of its higher bandwidth products in response*

<sup>131</sup> See paragraph 7.47 of the consultation document.

<sup>132</sup> See paragraph 7.56 of the consultation document.

<sup>133</sup> See paragraph 7.57 of the consultation document.

*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. 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."<sup>134</sup>*

- *mitigating distributional impacts – "...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... 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."<sup>135</sup>*

#### *Dark fibre remedy design and pricing*

Taking this into account, Ofcom assesses several different pricing approaches for the dark-fibre remedy including:

- no specific pricing obligation;
- fair, reasonable and non-discriminatory pricing obligations with guidance ('FRND'); or
- charge control.

Dismissing the 'no specific pricing obligation' and the 'FRND' options, Ofcom focuses on the charge control option based on either a cost-based approach or a value-based ('active-minus') approach (setting passive access charges equal to the price of an active service (or basket of services) minus the relevant incremental costs attributable to the active service).

Ofcom assesses the impact of each pricing approach on economic efficiency (including productive, allocative and dynamic efficiency), compatibility with active remedies/risk of arbitrage, risk of gaming, and ease of implementation. Note that Ofcom uses the **current active pricing structure** as the starting point for considering the potential interactions between passive and active services.<sup>136</sup>

Ofcom conducts a qualitative assessment and provides an imprecise 'score' for how each of the pricing approaches performs

<sup>134</sup> See paragraphs 7.61-7.64 of the consultation document.

<sup>135</sup> See paragraph 7.68-6.69 of the consultation document.

<sup>136</sup> For example, see paragraph A24.145 of the consultation document.

against each of the possible issues.<sup>137</sup> It considers that a DF remedy with an active-minus pricing approach would provide the best balance between the benefits and the risks identified. In particular, Ofcom 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.*”<sup>138</sup>

Ofcom concludes that it is possible to design a dark fibre remedy to deliver substantial benefits whilst mitigating the risks, including the risks that would arise from imposing it alongside active remedies. It views this approach to better balance the costs and benefits than passive access in the form of duct access would be and therefore represents the most appropriate form of intervention, even more so than an approach based solely on active.<sup>139</sup>

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<sup>137</sup> See tables A26.2 – A26.7 of the consultation document.

<sup>138</sup> See paragraph 7.75 of the consultation document.

<sup>139</sup> See paragraph 7.76-7.78 of the consultation document.

## 4 Risks and benefits

*Ofcom's argument is relatively simple...*

Overall, the *structure* of Ofcom's argument in favour of the introduction of DF remedies is relatively simple. Ofcom consider the possible impacts of the introduction of a passive remedy. Ofcom acknowledges that there will be both costs (which it refers to as 'risks') and benefits. Ofcom also considers the risks associated with passives under different approaches to pricing of a dark fibre remedy. As a result of this assessment Ofcom implicitly concludes that an 'active minus' pricing approach with EAD 1Gbit/s as the reference product, along with some adjustments to the active pricing regime, will lead to a significant reduction of the scale and scope of the risks of passives. Therefore, having chosen the pricing regime that it believes will almost entirely remove the risks, Ofcom's assessment of passives is essentially reduced to a consideration of the benefits, with one of the main benefits being the innovation possibilities that *may* be realised but for which there is little evidence.

*...yet there remains a lack of any clear balancing of the risks and benefits on the basis of specific proposals.*

Although any direct comparison of the scale and scope of the risks and benefits is limited, Ofcom's main assessment appears to be in its assessment of the relevant pricing regimes for passives, comparing how the impacts would differ depending on the form of pricing. However, this assessment is largely qualitative and simply amounts to a comparison of a range of alternatives with little or no real primary assessment of suitability. There is no clear presentation of the trade-offs between the risks and benefits or any transparency in how Ofcom has 'added up' the 'scores' to come to a conclusion that pricing DF using an active-minus approach could justify its introduction. Further, this analysis takes place on the presumption that Ofcom will impose passive remedies and is assessed independently from the specifics of any alternative active regime, the details of which are deferred to the LLCC consultation.

In this section, we highlight the key issues with Ofcom's assessment of the risks (which we also refer to as 'costs' reflecting the fact that the introduction of passives may lead to costs in terms of economic welfare as well as benefits), highlighting the flawed nature of its assumptions, the highly subjective nature of its assessment and the lack of evidence it has provided to support its conclusions. We stress the need for Ofcom to improve its balancing assessment.

We provide a more detailed response to some of the specific arguments raised by Ofcom in terms of its assessment of the risks and benefits in Annex A and Annex B.

## 4.1 Ofcom has oversimplified its assessment of the risks

*The risks are presumed to be small or easily mitigated*

Ofcom has identified five categories of potential risks associated with the coexistence of a dark fibre remedy with actives: dynamic efficiency; allocative efficiency and distributional impacts; productive efficiency; structure of competition; and implementation costs. However, as demonstrated by Ofcom's summary table (table 7.1), it concludes that the scale and scope of these risks can be addressed either by the 'design' of the remedy, or are simply presumed to be small or insignificant with little evidence provided to support this.

In Table 2 below, we have added an additional column to Ofcom's summary table, demonstrating that Ofcom considers that two out of the five major risks can simply be dismissed without being supported by any significant evidence or analysis. For example, Ofcom dismisses 'implementation costs' on the basis that these can be recovered by uplifting the costs in the Ethernet basket and in terms of the 'structure of competition' Ofcom presumes that these are unlikely to be major.

Ofcom's suggestion that there would not be a significant change in the structure of competition seems to contradict what it is hoping for when assessing the benefits and considering 'innovation' over DF through the benefits. Further, Ofcom has not taken into account how buyer behaviour for DF will be different from that under actives. For example, it does not take into account that DF can be used for other purposes e.g. as part of a new NGA network and the possible incentives and buyer behaviour of CPs as a result. It cannot be assumed that DF will be used by CPs to provide services of a similar purpose to BT's active services, and Ofcom must consider the dynamic incentives for OCPs. There is a high level of uncertainty about how exactly the DF product could and would be used by CPs and there is a risk associated with relying on presumptions in the absence of any credible evidence about buyer behaviour.

Table 2: Ofcom's solutions to the risks of introducing passive remedies

	<b>Description</b>	<b>Scale and scope of risk</b>	<b>Ofcom's solution</b>
<b>Dynamic efficiency</b>	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.	<b>Dark fibre with active minus pricing EAD 1Gbit/s as the reference product</b>
<b>Allocative efficiency and distributional impacts</b>	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.	<b>Dark fibre with active minus pricing with EAD 1Gbit/s as the reference product</b> <b>Adjustments to active prices</b>
<b>Productive efficiency</b>	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.	<b>Dark fibre with active minus pricing with EAD 1Gbit/s as the reference product</b> <b>Adjustments to active prices</b>
<b>Structure of competition in the market</b>	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.	<b>Presumption without sufficient evidence</b>
<b>Implementation costs</b>	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.	<b>Estimate costs and uplift the costs in the active Ethernet basket.</b>

Source: Ofcom's Table 7.1 'Summary of the impact and risks of introducing passive remedies' reproduced with additional column 'Ofcom's solution'

The remaining three risks (dynamic, allocative and productive efficiency) are presumed to be addressed/mitigated by the pricing regime. We provide a more detailed response to some of the specific arguments put forward by Ofcom in terms of the likely impact of passives on each of these forms of efficiency in Annex A .

However, ultimately Ofcom’s arguments are based on the assumption that implementing a dark fibre remedy based on an ‘active minus’ pricing approach with EAD 1Gbit/s as the reference product will solve many of the risks presented. These risks are complicated and are unlikely to be mitigated with the single pricing solution Ofcom is proposing. As we explain below, Ofcom’s pricing approach cannot fully mitigate these risks and there remains a very real possibility that the introduction of DF in the way proposed by Ofcom will still result in negative impacts on investment incentives (of both BT and OCPs), a rebalancing of the pricing gradient for actives away from the efficient pricing structure, and inefficient entry.

Ofcom has drastically oversimplified the situation and maintaining an implicit assumption that pricing will mitigate the risks is misleading.

## Ofcom’s pricing approach does not mitigate the risks

*Ofcom’s assessment hinges on an implicit assumption*

Ofcom’s implicit assumption that it is possible to design out the risks, or that many of the risks associated with the introduction of DF will be reduced to zero if it applies a pricing rule taking an ‘active-minus’ approach with a single reference product is highly problematic.

If just one downstream product can be produced using the upstream input, and there is competition in the downstream market, then in theory Ofcom’s approach of pricing the input based on the price of the downstream product less the “*relevant incremental costs attributed to the active service*”<sup>140</sup> (somewhat akin to the ‘Efficient Component Pricing Rule’ (ECPR) also referred to as the ‘retail-minus’ approach<sup>141</sup>) may be sensible.

In particular, the usual assumptions of the retail-minus approach are that there is some wholesale product – call it  $W$  – where one unit of

<sup>140</sup> For example, see paragraph 7.74 of the consultation document.

<sup>141</sup> The efficient component pricing rule originally stems from work by Robert Willig, “The Theory of Network Access Pricing”, in HM. Tebbing (ed.), *Issues in Public Utility Regulation*, Michigan, Michigan State University Public Utility Papers, 1979. William Baumol later provided exposition of the rule. Thus the rule is sometimes also referred to as the Baumol-Willig pricing rule.

$W$ , with the application of some downstream cost  $c$  – yields one unit of a retail product  $R$ . There will be efficient replacement of the downstream activity by making  $W$  available at the retail price less  $c$ .

*The 'minus' must also account for the opportunity cost*

In most cases,  $c$  will include not only the incremental costs of providing the downstream product, but also a term for the opportunity cost in terms of lost margins on the sale of downstream services. Where there is a single homogenous product (that the vertically integrated incumbent and the rivals both provide) that can only be provided with access to the key input, where inputs are combined in fixed proportions, and where there is no possibility of obtaining the key input from elsewhere than from the dominant firm then the simple approach is suitable. However, if any of these assumptions do not hold, then the simple approach is insufficient.<sup>142</sup>

*This includes margin erosion from cannibalisation and aggregation*

There are some important differences in this case that will mean that a simple 'active minus' approach may not lead to a price for passives that allows only for efficient entry and leaves BT indifferent between providing DF or the active service. Most importantly, the capability of the passive service is far greater than that of a single EAD 1Gbit/s active service. Upon accessing DF, CPs could provide any one of a range of services over the fibre, not just a directly comparable EAD 1Gbit/s service. Furthermore, it is possible that the CP could provide multiple downstream services over a single fibre that it obtains by purchasing DF. For these reasons, it is entirely likely that this will give rise to a larger risk to BT's revenues and lead to a larger 'lost margins' effect than in the simple case.

Additionally, there are a number of constraints imposed on the regulated retail prices of BT's EAD products such that subtracting the incremental costs of providing the active service may not necessarily provide the price that encourages efficient entry.

*Ofcom has not captured the risks of margin erosion*

In setting out the details of the 'active-minus' approach Ofcom is not considering the opportunity costs faced by BT, as would be required according to the general principles behind the ECPR. These opportunity costs should be assessed against a counterfactual that the regulatory structure for active services has been optimally designed. On that assumption, they would need to include the lost gross margin (and so contribution to common costs

<sup>142</sup> A simple example of the 'retail minus' or 'efficient component pricing rule' can be found in Baumol and Sidak ('The Pricing of Inputs Sold to Competitors', Yale Journal on Regulation, Volume 11, number 4, Winter 1994). The basic model has been extended by Armstrong, Doyle, Vickers, ("The Access Pricing Problem: A synthesis", The Journal of Industrial Economics, June 1996, 131-149) to allow for the calculation of the efficient entry inducing access price where there can be product differentiations, bypass and input substitution possibilities and an extension to the multiple-product case.

from) all of the various active services affected by the introduction of a passive product, including both the effects of lost volumes and pricing changes. However, a proper estimation of the opportunity costs is very difficult and there is some uncertainty about how exactly to capture all these costs in a simple pricing approach. This does not mean that such opportunity costs can be ignored but undermines the idea that an EAD-minus approach can be used.

There are two main issues that Ofcom has overlooked when considering the impact of DF with an 'active-minus' pricing structure (and which would lead to lost margins for BT that are not accounted for in the simple active-minus approach):

- the undermining of high bandwidth services – DF can sustain services higher than 1 Gbit/s so BT will lose margins on these higher bandwidth services (Ofcom has considered some adjustments in the LLCC consultation even though the issue was not raised in the BCMR documents);
- aggregation of services – Ofcom has assumed that there will be a simple one-for-one substitution between actives and passives. In this case, active services below 1Gbit/s will also be potentially subject to switching to passives with associated lost revenues (this has been overlooked by Ofcom).

*Not accounting for aggregation could have important consequences*

This aggregation point is particularly important. For each DF, BT will potentially see lost revenues on multiple active services. This is not accounted for by Ofcom and it has assumed throughout its assessment of the costs that there will be a simple one-for-one substitution between actives and passives.<sup>143</sup> There is an internal inconsistency with the comments made by Ofcom during its product market assessment, where it acknowledged that demand could be satisfied by using a single high capacity line or multiple low capacity lines,<sup>144</sup> demonstrating that aggregation is a viable option. Furthermore, we understand from BT that the risk of OCPs choosing to provide multiple active services over a single fibre is a distinct possibility.<sup>145</sup>

Ofcom's argument that there will be limited opportunities for aggregation beyond those that already exist and are available with existing products ignores the economic incentives that investors will face under the new regulatory regime. Whereas the current network over which active services are provided has been built on a

<sup>143</sup> For example, see paragraph A24.168 of the consultation document and paragraph 6.82 and 6.94 and of the LLCC consultation.

<sup>144</sup> See paragraph 4.32 of the consultation document.

<sup>145</sup> See sections 10 and 17 of BT's response to the consultation document.

relatively 'fibre rich' basis (meaning that there is more fibre and less aggregation) given that BT made its choices about roll out and fibre utilisation on an incremental basis as demand increased, it is highly likely that OCPs will seek out more aggregation possibilities going forward to employ a 'fibre lean' network. This is true not only for using DF to provide multiple leased line type services over a single fibre, but potentially also in other markets given the relatively loose restrictions on the use of DF and the transition to all IP networks.

*incentives to aggregate may be stronger in areas where multiple businesses are closely located*

The incentives to aggregate services will be particularly strong in areas where there is sufficient demand for multiple services for one business, or services for multiple businesses closely located. The risk of margin erosion may extend to services below 1Gbit/s (the reference product) in these areas where there are clusters of demand. In that case, the prospect of buying DF and using it to supply multiple sub-1Gbit/s services will be commercially viable. This has particular implications for the investment incentives of other CPs as a result in competitive or prospectively competitive areas and highlights the potential issues with Ofcom's geographic market definition. If Ofcom had identified these clusters as being (potentially) competitive and therefore not imposed DF remedies in these areas, then DF would only be available where businesses and sparsely populated, where there is limited demand and where there is limited competition. In the latter areas, the risk of DF being used to provide multiple aggregated lower bandwidth services over a single fibre is limited and so the risk would be mitigated.

*Discounting aggregation possibilities has a number of implications for the assessment of the risks*

By underestimating the extent to which aggregation of multiple services over a single fibre would take place, Ofcom's assessment of the costs and risks (and the ability to control for these) is undermined. Introducing the possibility of aggregation undermines many of the arguments put forward by Ofcom. In particular, for its assessment of the likely impact of pricing on an EAD-minus basis.

Assumptions about the level of aggregation have implications for the assessment of investment incentives of CPs, BT's cost recovery (i.e. extent to which price rebalancing may occur), allocative efficiency, arbitrage (by density and by circuit length), and Ofcom's calculations for the cannibalisation of circuits that it conducts in the LLCC consultation (as discussed in more detail in Annex A ). Therefore, it is important that the assumption is consistent with technical and commercial reality.

*There may also be longer-term consequences*

In any case, there are other issues associated with the proposed pricing approach, including that it is not future proof. As we discuss in more detail in Annex A , there is a legitimate concern regarding locking in the current generation of active services and what happens if these change. Simply asserting that the a change to the reference product or pricing regime could be considered at the next pricing review understates the importance of this issue and the potential impact on investment incentives (which Ofcom has not included in its assessment of the dynamic efficiency impacts when

considering the risks). For example, there are potential negative impacts on investment incentives due to regulatory uncertainty, which could dampen the investment incentives of CPs who expect the price to change for better or worse, and limit the benefits on which the introduction of DF is based on. It is important therefore, that Ofcom can set a price for DF that will, with some certainty, remain predictable over a relevant time-scale linked to the investment appraisal timeline and/or the asset life of products to be used by CPs accessing DF (both of which are likely to extend beyond the next review period and even the life of EAD).

## 4.2 Ofcom needs stronger evidence to demonstrate the benefits

*Ofcom must demonstrate that there are clear incremental benefits*

Given that the costs cannot be reduced to zero using the pricing approach proposed, Ofcom must clearly demonstrate that the incremental benefits are sufficiently large and that they will outweigh the risks it has identified and the costs in terms of economic welfare. However, despite reporting that there are benefits relative to actives alone (innovation, productive efficiency savings and future deregulation), Ofcom has provided no concrete evidence that benefits will materialise.

As we discuss in more detail in Annex B, Ofcom does not provide satisfactory evidence to demonstrate that the innovation benefits on which it relies are sufficiently certain. Whilst Ofcom has attempted to quantify the productive efficiency savings associated with introduction of DF this may overstate the cost savings, and it is highly unrealistic to place any weight on the benefits of being able to remove regulation in future.

*There is a lack of evidence to support the 'key benefit'*

Ofcom has emphasised the possibility of 'innovation' as the 'key benefit', suggesting that access to DF would allow greater competitive differentiation and faster development as well as stimulating the emergence of new technical solutions.<sup>146</sup> However, Ofcom's supporting evidence is weak and we are concerned that it does not appear to have placed any weight on the arguments made in our previous report that innovation possibilities are likely to be limited by industry standards often beyond the control of individual CPs. We do not consider the specifics of Ofcom's innovation arguments in detail here, as BT have considered the detail on this. However, there is great uncertainty about the extent to which the possibility of, and incentives for, such innovations rests on passive

<sup>146</sup> See for example paragraph 1.30 of the consultation document.

remedies. Indeed, Ofcom appears to accept the possibility of some 'innovation' benefits to be sufficient. This represents a change from its previous stance where it required strong evidence on the take up and uses of passive remedies that will influence the magnitude of any benefits associated with passives, for example, during the Colt appeal.<sup>147</sup>

*Quantifying the productive efficiency savings*

Ofcom has sought to quantify some of the proposed sources of benefit and it reports a productive efficiency savings of approximately £60-100m in the long run. The analysis conducted by Ofcom suggests that this saving comes largely from avoiding duplication of network monitoring elements. However, the scale of potential costs savings does not include any offset for the costs of equipment that would have to be added in place of BT's monitoring equipment or alternative methods of monitoring faults. Where a fully automated system is put in place, there will need to be an interface between the operations support systems (OSS) of the CP who is conducting real time monitoring, and Openreach's OSS to allow it to test the fibre should a fault be reported.<sup>148</sup> This may be difficult and costly, as we understand from BT that there is a lack of standardisation in the APIs that allow CP equipment to report faults to BT, and until there is any particular standardisation, it is highly likely that BT will still have to have some sort of monitoring equipment attached to the DF. Other policies such as manually testing processes are likely to be costly, and unlikely to scale should DF see significant take up.

*Presenting as a benefit the ability to remove regulation in the future is disingenuous*

Ofcom also present as a benefit, the ability to remove regulation in the future. For this to be true, the volume of passives would have to be significant and they would need to replace actives to some extent. However, Ofcom cannot then have it that passives do not run much risk. Similarly, given that the justification for introducing passives must be somewhat predicated on the fact that take-up may be significant, BT will need considerable flexibility to rebalance its active prices.<sup>149</sup>

<sup>147</sup> For example at paragraph A23.87 of the consultation document, Ofcom state: *"We do not seek to take a view as to the specific innovations that would occur with passive remedies. Rather, we recognise that in principle access to passive inputs would give CPs the flexibility to differentiate, innovate and upgrade without being dependent on BT... We recognise that a wide range of future innovations may emerge and that passive remedies would allow CPs greater flexibility to develop these faster."*

<sup>148</sup> BT discusses this issue in full in section 16 of its response to the consultation document.

<sup>149</sup> In the LLCC consultation Ofcom considers adjustments to the active pricing regime to give BT greater flexibility. However its assessment relies on a range of assumptions on likely active circuit cannibalisation, including an incorrect assumption that substitution will be one-for-one.

## 4.3 Costs and benefits are assessed qualitatively and without specific proposals

Ofcom has conducted a mainly qualitative assessment of the extent to which the costs and benefits would materialise, and its assessment takes place in the absence of specific details of the proposed package of remedies.

For example, in Annex 26, where Ofcom undertakes its assessment of a number of alternative pricing options and the impact in terms of the costs and benefits, the assessment is entirely qualitative. Ofcom provides only an imprecise 'score' against each of the possible issues (see tables A26.2 – A26.7) and the summary in Table A26.8 does not show that any particular option is clearly superior from any other.

*The impact of the specific proposals on the scale and scope of the costs and benefits is not considered*

When undertaking this assessment of the costs and benefits, the exact nature of the remedies being proposed is still uncertain. The assessment takes place in the absence of some specific details that will undoubtedly have an influence on the scale and scope of both the costs and the benefits of its proposed remedies. Ofcom's qualitative assessment of the costs and benefits in the presence of passives priced on an active-minus basis (with a single reference product of EAD (EAD LA) 1Gbit/s) takes place despite Ofcom noting that the exact 'minus' will be subject to guidance that will be issued elsewhere and that adjustments will be made to adjust its active pricing structure to limit the scope for arbitrage and continue to recover common costs.<sup>150</sup>

For example, Ofcom considers in a number of places that it may be required to make adjustments to the active access pricing structure to ensure, for example, that BT has enough flexibility to adjust its active pricing structure to limit the scope for arbitrage and continue to recover common costs<sup>151</sup> yet has not fully specified how it would do this in the BCMR where it decides to introduce DF remedies.

We recognise that Ofcom has provided more details on both the specifics of the active-minus pricing regime and adjustments to the active access pricing regime in the LLCC consultation. Whilst these two documents are to be read together,<sup>152</sup> there remains a clear separation between the two in terms of the cost-benefit assessment. Ofcom has not presented any additional, detailed

<sup>150</sup> For example see paragraph A24.154 onward of the consultation document

<sup>151</sup> For example see paragraph A24.154 onward of the consultation document

<sup>152</sup> See paragraph 2.4 of the consultation document.

analysis in the LLCC to demonstrate the impact of these specific proposals on the scale and scope of the possible costs and benefits that may arise from the introduction of passives, and the analysis in the BCMR takes place without these specific details.

In any case, Ofcom's qualitative assessment is so imprecise and has not considered the issues in sufficient detail, that it is unclear how Ofcom would update its assessment of the pricing regime once the precise proposals are known. This highlights the imprecise and incomplete nature of Ofcom's cost-benefit assessment, as the specifics will certainly have severe implications for the incentives faced by both BT and potential users of DF that have been overlooked by Ofcom. As we discuss below, Ofcom must establish a much clearer balancing framework and provide sufficient evidence to support the presumptions it has made in its in the current consultation.

## 4.4 Lack of a balancing framework

Choosing to impose dark fibre remedies with active-minus pricing on the basis that from amongst the different options for pricing of passive remedies this provides the best balance of costs and benefits is not sufficient.

Ofcom's comparison and assessment of the costs and benefits is lacking in a number of aspects, each of which would need to be improved upon ahead of any further proposals regarding the implementation of passive remedies. In particular, when weighing up the net-impact of introducing passive remedies, Ofcom has not:

- considered trade-offs or weightings based on the level of uncertainty or the time period over which the different costs and benefits will be realised; or
- demonstrated that its preferred approach represents the best form of intervention (from a range of alternatives) to address the competition issues it has identified.<sup>153</sup>

*No clear trade-offs have been identified*

Ofcom has sought to quantify some of the proposed sources of benefit and it reports a productive efficiency savings of approximately £60-100m in the long run. In order to provide a true assessment of the net-benefit of passives in terms of costs of equipment and saving, Ofcom ought to have off-set these cost

<sup>153</sup> In line with its Regulatory Principles Ofcom must ensure its interventions will be evidence-based and proportionate, and seek the least intrusive regulatory mechanisms to achieve its objectives. Article 8 of the Access Directive also requires that obligation imposed in accordance with Article 8 of the directive shall be based on the nature of the problem identified and be proportionate.

savings with any of the additional costs that may arise from new monitoring systems and the costs of stranded assets and loss of economies of scale/scope in BT's network that Ofcom considered in its assessment of the costs and risks. Furthermore, Ofcom has not attempted to quantify the costs faced by BT and Openreach as a result of restructuring, or the expected benefits in terms of innovation and competition.

We recognise that it is not possible to quantify all of the possible impacts, but Ofcom's analysis should be sufficiently detailed and transparent to demonstrate that if it decides to introduce passive remedies, doing so would be net-welfare enhancing. In contrast, in Ofcom's qualitative assessment of the different passive pricing approaches in Annex 26 there is no transparent assessment of the trade-offs between the costs and the benefits it has identified and it is not clear how Ofcom has balanced the costs and benefits in each case, or how it has 'added-up' the scores to justify its preferred form of intervention.

*Ofcom must account for short and long-run effects in its analysis*

There will be both short and long-term impacts of Ofcom's proposals each of which must be captured in its assessment. Although Ofcom recognise that the impacts are likely to be realised long-term (i.e. arising beyond the 2016-19 review period) and that *"it is particularly important for us to consider effects over the long term"*<sup>154</sup> it has not balanced this against any shorter-term impacts, the uncertainties associated with the costs and benefits or the extent to which adopting particular approaches may be difficult to reverse.

For example, despite considering the benefits of being able to remove regulation in the long-run, it has not balanced this against the costs of having more intrusive regulation and access regulation at multiple points in the short to medium term. Furthermore, inefficient entry is a serious concern and Ofcom has misunderstood the nature of the impact of its proposals in the short and long term.

Whilst the take-up of passive remedies may only be realised in the long-term there is still an immediate impact on CPs incentives, as put forward by BT: *"the substantial reduction or even removal of the price gradient is a profound change in price structure of upstream supply and this will cause a major shift in the optimal network structure for CPs. As the effect is wide reaching for the CPs, this may take time to be fully revealed in the marketplace and quite likely in a timeframe beyond that of the current review period. However, the incentives will have been set and the consequences will have been set in train in this review period."*<sup>155</sup>

<sup>154</sup> See paragraph 7.36 – 7.38 of the consultation document.

<sup>155</sup> See section 17 of BT's response to the consultation document.

Ofcom has also failed to capture all of the possible short and long-term effects of its proposals. For example, in relations to investment incentives, as we discuss in Annex A, the imposition of DF remedies could have a significant impact on network design decisions in the long term. CPs may be encouraged to build fibre-lean networks (with lots of aggregation). However, fibre-rich networks (more fibre and less aggregation) are likely to provide greater flexibility and are likely to be more future-proof in delivering higher bandwidth services over time as the demand for bandwidth continue to increase.

The scale and scope of the costs and benefits may also evolve over time. For example, if Ofcom maintains the same reference product (at 1Gbit/s) over a long period of time, then some of the benefits that Ofcom puts forward to justify passive remedies will reduce over time. For example, Ofcom recognises that the bandwidth gradient on active products (which it considers to likely to be more efficient than a flat pricing structure<sup>156</sup>) would only be reduced for products of higher gradient than the benchmark product (of which there are relatively few). However, in the medium/long term it is likely that higher bandwidth circuits will account for a higher proportion of active revenues and thus there will be a greater convergence towards a flat bandwidth gradient, which is less efficient for recovery of common costs.

Alternatively, if the reference product or pricing approach is likely to change at next market review, then there is a lack of regulatory certainty, which could dampen the investment incentives of CPs who expect the price to change for better or worse, and limit the benefits on which the introduction of DF is based on.

*Ofcom cannot be certain of the scale and scope of the impacts*

There are some costs that seem inevitable as a result of the introduction of passives. Costs arising in the short-medium term should be given a greater weight than the uncertain benefits that will potentially be realised only in the long-term. For example, the benefits in terms of improved dynamic efficiencies as a result of possible innovation, service differentiation and quality of service improvements are more speculative than costs. There is an important distinction to be made between genuine competition and innovation benefits arising from efficient entry and the benefits to individual CPs as a result of regulatory arbitrage opportunities.

*Ofcom has not assigned weights to the different costs and benefits*

Given the nature of the uncertainties associated with the costs and, in particular the benefits, the likely time horizons over which the risks/costs and benefits may be realised and the difficulty of unwinding the regulation if the expected benefits are not realised, the weight applied to the issues in any impact assessment is of

<sup>156</sup> See paragraph A24.143 of the consultation document.

great importance for the conclusions. There is no evidence that Ofcom has considered the extent to which risks/costs and benefits are uncertain or applied different weights to the various risks and benefits accordingly.

*Ofcom has not assessed any alternative forms of intervention*

Even if we were to accept that Ofcom's rudimentary analysis leads to the conclusion that to impose DF remedies with active-minus pricing would provide the best balance of costs and benefits from amongst the available options *for imposing passive remedies*, that would still not be sufficient. Suggesting that pricing option X is best overall because there is some option Y that is worse is not enough to demonstrate an optimal, proportionate choice of policy. In line with its Regulatory Principles Ofcom should seek to impose the least intrusive regulatory mechanism to achieve its objectives.<sup>157</sup> Ofcom must also demonstrate that the preferred passives option will necessarily lead to better outcomes than alternative remedies, such as a regime of (adjusted) regulated active access only. Ofcom must demonstrate that the proposed package of remedies is proportionate showing that the costs of such a change are outweighed by any benefits, and that the net benefit is greater than could be achieved with any other form of intervention.

Despite acknowledging (in the Preliminary Passives consultation) a requirement to do this, Ofcom has not presented any such comparison in this BCOMR.<sup>158</sup> As discussed in section 4.2 and Annex B, the benefits presented by Ofcom that it considers to be benefits relative to an active only regime are uncertain and not supported by sufficient evidence, in particular the 'key benefit' of innovation possibilities. Although Ofcom have made comments such as "*we 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*"<sup>159</sup> Ofcom has failed to provide any transparent demonstration that the introduction of passives (in combination with the active access

<sup>157</sup> See Ofcom's Regulatory Principles available at: <http://www.ofcom.org.uk/about/what-is-ofcom/statutory-duties-and-regulatory-principles/>

<sup>158</sup> For example, Ofcom recognised that in considering different remedies, "... we will need to compare packages of remedies consisting solely of active remedies with packages of remedies consisting of both active and passive remedies." See paragraph 3.5 of 'Business Connectivity Market Review - Preliminary consultation on passive remedies', Ofcom, 5 November 2014.

<sup>159</sup> See paragraph 7.76 of the consultation document. See also paragraph 7.39 of the consultation document: "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 competition problems in the relevant markets than a package of remedies including active access only"

regime, specified in the LLCC Control) would provide a net-benefit greater than could be achieved with any other form of intervention.

Ofcom should have conducted a full and detailed impact assessment in which it compares a range of options with the existing regulatory regime to assess which remedy represents the most appropriate and best overall approach to address the nature of any market failure identified in the market analysis (where there are genuine competition concerns identified that are not already dealt with under the existing regime).

## 5 Conclusions and the way forward

*The introduction of passive remedies should be evidence-based and proportionate*

Given the wide-ranging impacts associated with the introduction of passive remedies and the strategic nature of its decision, Ofcom should provide clear evidence to demonstrate why this more intrusive regulation is the most appropriate remedy to deal with any issues identified in its market power assessment, and that this is a proportionate remedy.<sup>160</sup> In this regard, Ofcom should have demonstrated that the costs of such a change in the regulation are outweighed by any benefits, and that the net benefit is greater than could be achieved with any other form of intervention.

*Ofcom needs to revisit certain aspects of its product and geographic market definition*

Ultimately, any need for regulatory intervention must derive from a demonstrated lack of effective competition within a properly defined relevant market. However, Ofcom's market definition has worrying consequences for its competitive assessment, as there are systematic and cumulative biases in the view of higher bandwidth services that result from both the single product market (for which Ofcom has not provided sufficient evidence) and the approach to geographic market definition. This results in Ofcom continuing to define high bandwidth services as uncompetitive despite BT's low market shares on these services, providing an inaccurate view of the level of competition in the market and has major consequences for its decision to impose dark fibre remedies in all areas other than the CLA.

Ofcom's market definition should take into account the full extent of the interaction between product characteristics and location recognising that substitution possibilities might vary by locality. As it stands, the way in which Ofcom seeks to identify areas of competitive supply necessarily tends to miss clusters of competitive supply which will disproportionately be in areas where there are businesses with demand for high bandwidth services i.e. those more likely to be substitutable for DF. Ofcom has misidentified these high value areas with existing or emergent infrastructure-based competition (and in expansion areas) as uncompetitive. Imposing DF remedies in these areas will undermine existing investments and have consequences for the investment incentives and the build-buy decisions of CPs limiting the potential benefits from full infrastructure competition.

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<sup>160</sup> In line with its Regulatory Principles Ofcom must ensure its interventions will be evidence-based and proportionate, and seek the least intrusive regulatory mechanisms to achieve its objectives. Article 8 of the Access Directive also requires that obligation imposed in accordance with Article 8 of the directive shall be based on the nature of the problem identified and be proportionate.

<i>Ofcom's analysis is insufficient to justify passive remedies</i>	Notwithstanding the drawbacks of Ofcom's market definition, Ofcom has not done enough to justify the introduction of passives. It has oversimplified the assessment of the risks, relying on a presumption that the pricing approach will mitigate the majority of the risks, and has not provided sufficient evidence to support the possible benefits it has identified.
<i>There remain substantial risks...</i>	Ofcom's decision to impose passive remedies relies strongly on its implicit assumption that, through its pricing approach it can mitigate the majority of the risks associated with introducing such a remedy. We have demonstrated why this cannot be the case, especially given that the capabilities of dark fibre are greater than those provided as a reference active product. For example, the ability to aggregate services over a single fibre (through multiplexing and aggregation), has implications for the assessment of BT's lost margins and circuit cannibalisation calculations. The proposed pricing regime does not take this into account, and there are good reasons why, should Ofcom decide to introduce DF remedies, the price for DF access should actually be greater than would be the case under Ofcom's current proposals. Although we have not been asked to consider what the optimal pricing approach might be, it is clear that the risks will be greater the larger the minus applied by Ofcom in the 'EAD-minus' approach and the lower the resulting price for passive access.
<i>...and the benefits are unsupported</i>	<p>Given that substantial risks remain under the current proposed pricing approach proposed, Ofcom should have demonstrated that the incremental benefits will be sufficiently large and that they will outweigh the risks. However, Ofcom has not provided satisfactory evidence to demonstrate that the innovation benefits on which it relies are sufficiently certain. Whilst Ofcom has attempted to quantify the productive efficiency savings associated with introduction of DF this may overstate the cost savings, and it is highly unrealistic to place any weight on the benefits of being able to remove regulation in future.</p> <p>Ofcom's current approach fall short of the requirements outlined in its Regulatory Principles. Ofcom should have provided more detail to demonstrate that its decision to introduce passive remedies is "<i>evidence-based, proportionate, consistent, accountable and transparent in both deliberation and outcome</i>".<sup>161</sup></p>

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<sup>161</sup> See Ofcom's Regulatory Principles. Available at <http://www.ofcom.org.uk/about/what-is-ofcom/statutory-duties-and-regulatory-principles/>

*Ofcom should re-evaluate the impact of its proposals to introduce DF with more evidence...*

Given that many of the assumptions relied upon by Ofcom in this consultation are flawed and the lack of evidence to support the benefits, at the very least, Ofcom would need to re-evaluate the impact of its current proposals following adjustments to its underlying assumptions and gather more evidence on the impact of the proposals both in terms of costs and benefits.

For example, Ofcom should have taken into account the commercial and technical realities that would allow for aggregation of circuits and the use of DF as a substitute for lower bandwidth active services as well as those at or above 1Gbit/s. As such, Ofcom would have to revisit its conclusions relating to the assessment of BT's lost margins, circuit cannibalisation, cherry picking, the impact on the bandwidth gradient and the impact of introducing DF in areas where there are clusters of competition.

*...apply weights based on timescales...*

Having properly identified the benefits and costs, Ofcom should have provided some indication of the timescales over which these will be realised taking into account both the long-term and short-term consequences of its proposals. This includes the extent to which its proposals will be future proof. For example, if the reference product or pricing approach is likely to change at next market review, then this undermines regulatory certainty, which could dampen the investment incentives of CPs who expect the price to change for better or worse, and limit the benefits on which the introduction of DF is based on.

*...apply weights based on probabilities...*

Further, each of the risks and the benefits should have been assessed alongside the probability of it taking place. For example, in reality, when introducing passives there appears to be a small possibility of a modest innovation - the upside is very limited. In contrast, there is a high probability of implementing the remedy in such a way that leads to significant costs and risks.

*...and rank the issues according to their weighting*

The various issues should have been ranked in order of importance according to the weighting applied to each of the key issues rather than simply comparing broad categories of pricing approach across a range of different criteria. Of key importance is the impact on investment incentives and common cost recovery (i.e. allocative efficiency and infrastructure-related dynamic efficiency).

*Choose the most appropriate form of intervention*

Furthermore, given that Ofcom needs to demonstrate that passives is the "least intrusive regulatory mechanisms to achieve its policy objectives"<sup>162</sup> Ofcom should have considered a range of alternative forms of intervention outlining (at least) two clear proposals. Ofcom would need to demonstrate clearly that when compared with

<sup>162</sup> See Ofcom's Regulatory Principles, available at: <http://www.ofcom.org.uk/about/what-is-ofcom/statutory-duties-and-regulatory-principles/>

alternatives and its statutory obligations, DF remedies represent the most appropriate and proportionate response to market failure and will deliver net benefits to business customers and, ultimately, consumers.

For example, Ofcom could have assessed any new regulation mandating passive access against changes to the existing regulatory regime for actives. Where there are genuine competition concerns identified that are not already dealt with under the existing regime, a natural question is whether the scope of active remedies or the form of price control could be beneficially altered without needing passives. Therefore, the relevant counterfactual when considering the introduction of dark fibre should be a well-designed system of regulation for an appropriate range of active access products.

*Introducing passive remedies is a largely irreversible decision*

Careful consideration of costs and benefits is particularly important as, if passives were introduced and taken up, they would be difficult to unwind. CPs may make complementary investments linked to passive products and might not be able to shift back readily to active access services. Therefore, a decision to introduce passive remedies is largely irreversible (or at least so costly to reverse as to be impractical) once passive products are taken up to any significant degree.

*A precautionary approach is appropriate*

Furthermore, there may remain some uncertainty about the exact scale and scope of the costs and benefits and the time period over which they will be realised. For an irreversible decision made under uncertainty, it is appropriate to apply the precautionary principle, where steps are made to control potential damage.<sup>163</sup> Applying the precautionary principle does not mean that the status quo must necessarily dominate. However, it is important to recognise that there is an option value foregone by making an irreversible decision, as the possibility of finding out more over time about costs and benefits, and so making a more informed decision, is lost. For this reason, expected costs should exceed expected benefits to a sufficient degree to compensate for the lost option value.<sup>164</sup> Put simply, where there is an irreversible decision with uncertain costs and benefits, then benefits should exceed costs by a sufficient margin that reflects this uncertainty.

<sup>163</sup> There has been significant debate about the implications of irreversible decisions in the context of public policy towards technological developments (e.g. introducing genetically modified crops). See for example UNESCO, "The Precautionary Principle", 2005 available at <http://unesdoc.unesco.org/images/0013/001395/139578e.pdf>

<sup>164</sup> See for example, Dixit and Pindyck (1994) "Investment under uncertainty", Princeton University Press.

Alternatively measures to de-risk any decision, such as a phased introduction, need to be considered.<sup>165</sup> Phasing change or considering staging posts along the way would be preferable to directly facing the unmitigated risk of a possibly dislocating change that is difficult to reverse.

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<sup>165</sup> For example, taking a gradual, phased approach trying changes to the active remedies first would deal with many of the issues facing the introduction of passives including issues such as the irreversibility concerns and potential wide reaching consequences of disruption to pricing and the scope for inefficient entry.

## Annex A Summary of Annex 24 and 26

*Ofcom has identified a number of costs and risks associated with the introduction of passive remedies*

In Annex 24 of the consultation document, Ofcom provides a detailed discussion of the risks associated with the introduction of passive remedies assessing the responses to previous consultations and the call for inputs. Ofcom acknowledge that the passive remedy could undermine existing investments made by other CPs in their own infrastructure and/or affect their future incentives to invest. Similarly, use of passives could result in reduced use of BT's existing infrastructure and assets, reducing BT's return, possibly undermining previous investments and limiting incentives to invest in the future.

A summary of the main issues considered by Ofcom are presented in Table 7.1 (and reproduced above at Table 1), comprising:

- dynamic efficiency, including investment incentives for BT and other CPs;
- allocative efficiency and distributional impacts arising from the implications for common cost recovery and rebalancing of prices;
- productive efficiency, including the potential loss of economies of scale;
- the structure of competition in the market; and
- implementation costs.

*The scale and scope of the risks will depend the nature of the remedy*

Crucially, the scale of the risks (which we also refer to as 'costs' reflecting the fact that the introduction of passives may lead to costs in terms of economic welfare) and benefits associated with the introduction of passive remedies is dependent on take-up and demand for passive access and heavily dependent on the specific nature of the remedy. For example the nature of costs and benefits are potentially different under DF and duct access remedies, not least due to the choice of regulated access price. Ofcom consider the range of potential impacts through a qualitative assessment, identifying how the impact may vary between duct access and DF remedies.

*Risks must be considered in light of co-existence of passives and actives...*

Ofcom analyses the risks that can arise from imposing passive remedies in the context of co-existence with the current active regime.<sup>166</sup> Ofcom acknowledge that there are some risks that arise specifically from imposing passives alongside the current regime for regulation of active services. For example, it recognises that CPs switching away from actives to passives could result in some assets being stranded and that “[i]f such stranded assets were not appropriately taken into account in setting the price for BT’s remaining services, it could lead to perceived regulatory instability/uncertainty which could reduce BT’s incentives to invest in infrastructure in the future.”<sup>167</sup> Ofcom note that this does not mean that the status quo should be retained, but recognise that the scale and scope of potential effects will depend on the specifics of the passive remedy.

*...this includes an assessment of the extent to which there will be substitution from actives to passives*

Ofcom has assumed throughout its assessment of the risks that there will be a simple one-for-one substitution between actives and passives.<sup>168</sup> However, there is an internal inconsistency with the comments made by Ofcom during its product market assessment, where it acknowledged that demand could be satisfied by using a single high capacity line or multiple low capacity lines,<sup>169</sup> demonstrating that aggregation is a viable option. Furthermore, we understand from BT that the risk of OCPs choosing to provide multiple active services over a single fibre is a distinct possibility.<sup>170</sup> Ofcom’s argument that there will be limited opportunities for aggregation beyond those that already exist and are available with existing products ignores the economic incentives that investors will face under the new regulatory regimes. It is highly likely that OCPs will seek out more aggregation possibilities going forward to employ a ‘fibre lean’ network, whereas the current network over which active services are provided has been built on a relatively ‘fibre rich’ basis (meaning that there is more fibre and less aggregation) given that BT made its choices about roll out and fibre utilisation on an incremental basis as demand increased. Furthermore, there are incentives for BT to provide a fibre rich network as this is more likely to be future proof given the increasing demand for ever-higher bandwidth services.

<sup>166</sup> See paragraph 7.46 of the consultation document.

<sup>167</sup> See paragraph A24.49 of the consultation document.

<sup>168</sup> For example, see paragraph A24.168 of the consultation document and paragraph 6.82 and 6.94 and of the LLCC consultation.

<sup>169</sup> See paragraph 4.32 of the consultation document.

<sup>170</sup> See sections 10 and 17 of BT’s response to the consultation document.

*Discounting aggregation possibilities has a number of implications for the assessment of impacts*

By underestimating the extent to which aggregation of multiple services over a single fibre would take place, Ofcom's assessment of the costs and risks (and the ability to control for these) is undermined. Introducing the possibility of aggregation undermines many of the arguments put forward by Ofcom, particularly in relation to the extent to which its pricing approach will mitigate the risks of arbitrage and allocative efficiency.

Assumptions about the level of aggregation will have implications for the assessment of investment incentives of CPs, BT's cost recovery (i.e. extent to which price rebalancing may occur), allocative efficiency, arbitrage (by density and by circuit length), and Ofcom's calculations for the cannibalisation of circuits that it conducts in the LLCC consultation. Therefore, it is important that the assumption is consistent with technical and commercial reality.

Furthermore, one cannot dismiss the extent to which passive access would undermine high bandwidth activities (including WDM) and the effect on common cost recovery and the underlying incentives for high bandwidth services where competition, although geographically limited, has established rapidly.

*Structure of this section*

In section A.1, we consider briefly some of Ofcom's general arguments on the risks associated with passives (as set out in Annex 24). Given that Ofcom is ultimately proposing the imposition of DF remedies, we concentrate on the comments made in relation to DF. Few of the arguments put forward by Ofcom present anything new over what has been debated previously, however, Ofcom has provided some suggestions as to why the impacts are likely to be small, or how such impacts could be mitigated by setting the 'appropriate' prices.

It is therefore important to understand Ofcom's choice of pricing for passives (and any adjustments to actives) and why it considers such an approach to largely mitigate all of the costs and risks associated with the introduction of passives. For this reason, the main focus of our response to Ofcom's assessment of the costs/risks is presented in section A.2 where we focus on Ofcom's assessment of the scale and scope of the risks in the context of its choice of pricing approach (as set out in Annex 26 of the consultation).

## A.1 Ofcom's assessment of the risks

### A.1.1 Dynamic efficiency

*Potential impact on BT's investment incentives*

Ofcom recognises that the scope for arbitrage opportunities poses a threat to the recovery of common costs and may arise from variations in density of network usage circuit length and the bandwidth gradient and that there will be some investment incentive effects that could have a detrimental impact on dynamic

efficiency. However, it considers that *“providing any passive remedy is priced in a way such that BT has an opportunity to recover its efficiently incurred costs including a rate of return on capital employed...it should not undermine BT’s investment incentives.”*<sup>171</sup>

For example, Ofcom considered the likelihood of arbitrage based on density of network usage, circuit length, the bandwidth gradient and assesses the risk of stranded assets following the introduction of passives. Ofcom’s conclusions are summarised in the box below.

#### **Ofcom’s conclusions on arbitrage risks and stranded assets**

- Density of network usage – *“This arbitrage risk appears to be lower for dark fibre as the need for a fibre for each circuit provided plus the existing availability of active aggregation services means the relationship between existing circuits and dark fibre is likely to be much closer to **one-to-one**...As a result, **the scope for CPs to be able to specifically target high density areas to exploit the higher profitability is likely to be more limited.**”*<sup>172</sup>
- Circuit length – *“shorter circuits will tend to make a greater contribution to common cost recovery relative to their cost of provision than longer circuits, and therefore have a greater margin which could be targeted by CPs using passive access...dark fibre priced on a distance-dependent basis would raise similar concerns as duct access priced on this basis, as CPs could target the higher margin on shorter active circuits. However...pricing dark fibre on a per circuit basis is likely to be much more practical, given a fibre is needed for each active circuit provided. By pricing on a per circuit basis, the dark fibre could reflect the existing distance-independent pricing differentials within active circuit types...This would reduce the risk of arbitrage based on circuit length as there would be greater consistency between the active and passive pricing approach, and so **this risk to BT’s investment incentives (and therefore dynamic efficiency) would not exist.**”*<sup>173</sup>
- The bandwidth gradient – *“If passive access is made available to competitors at a price which reflects a share of the average costs...a competitor...would be expected to target the services with the greatest contribution to common costs...This is the case irrespective of whether the duct or dark fibre is priced on a per circuit or distance-dependent basis...Therefore the ability to limit this arbitrage risk to BTs common cost recovery is likely to be limited to: a) rebalancing the active pricing structure...and/or b) the absolute level at which the passive price is set – all else equal, the higher the passive access price, the narrower the scope for CP’s to target circuits making the greatest contribution to BT’s common cost recovery... **Therefore setting a***

<sup>171</sup> See paragraph A24.46 of the consultation document.

<sup>172</sup> See A24.55 of the consultation document.

<sup>173</sup> See A24.56 – A24.61 of the consultation document.

**higher passive access price could reduce the scope for arbitrage based on the current bandwidth gradient.**<sup>174</sup>

*Risk of stranded assets – “where a CP uses dark fibre instead, [this] reuses more of the same infrastructure already supplying the existing active circuits... [however,] there could also be active-specific investment (e.g. in the electronic boxes at each end of the leased line) which could become stranded. However we consider that this risk is likely to be relatively limited as again, we consider that the remedy design could potentially reduce this risk... in any event, we would seek to approach any pricing of both passive, and active remedies (if appropriate) in a manner which provides BT with an opportunity to recover its efficiently incurred costs. Further, this could include, where appropriate, an estimate of the efficiently incurred costs which may become stranded as a result of the new remedy, so as not to distort future investment signals... We would also note that our focus would be those genuinely stranded within this review period as a direct result of passive remedies... Therefore, **we consider the risk of stranded investment undermining BT’s future infrastructure investment incentives is likely to be limited.***<sup>175</sup>

*Potential impact on the investment incentives of other infrastructure operators*

Ofcom recognises that the introduction of passive remedies may have a positive impact on CPs incentives to invest by providing a lower cost alternative to self-build in some areas.<sup>176</sup> However they also recognise that there is a potential trade-off: *“Although passive access potentially reduces the barriers to entry, introducing such an intermediate form of access on regulated terms could undermine existing investments made by other CPs in their own infrastructure, and/or affect their future incentives in areas which may be commercially viable.”*<sup>177</sup> However, Ofcom consider that the net impact is unclear and *“could be finely balanced”*.<sup>178</sup>

Ofcom proceeds to discuss how the design of any passive remedy could mitigate the risks whilst bearing in mind the advantages of self-build: *“... dark fibre could also reduce incentives for CPs to build their own infrastructure (particularly where BT fibre already exists), this would predominantly be where the benefits of self-build infrastructure investment are focused in control over the electronics (rather than the network itself)... we would expect there to be additional benefits of self-build to justify such investment (e.g. resilience, network design benefits etc). Therefore it is not clear that the fact that dark fibre would allow a CP to use its own electronic equipment would significantly*

<sup>174</sup> See paragraph A24.63 of the consultation document.

<sup>175</sup> See paragraphs A24.64 – A24.67 of the consultation document.

<sup>176</sup> See paragraph A24.75 of the consultation document.

<sup>177</sup> See paragraph A24.76 of the consultation document.

<sup>178</sup> See paragraph A24.80 of the consultation document.

*undermine investments made in infrastructure where there are additional benefits of doing so.*<sup>179</sup>

Ofcom consider that the risks to investment incentives are greater in the case of duct access rather than DF on the basis that duct would replicate more of the benefits of self-build but for a lower cost. The risk coming from DF will mainly be in the case where the benefits of self-build are in control over the electronics and so can be replicated with DF access.<sup>180</sup>

Ofcom consider that any issues arising from changes to the build-buy incentives can be dealt with providing that the passive price is consistent with the idea of providing *efficient* incentives. Ofcom argue that provided pricing is not below cost on a consistent basis with active pricing (and therefore not creating significant arbitrage opportunities) dynamic efficiency will not be undermined, even if some investment incentives are undermined relative to an active-only regime.<sup>181</sup> Furthermore Ofcom consider that *"in relation to the risks to BT's investment incentives, we consider that (broadly speaking and all else equal), the greater the level of consistency/compatibility which can be achieved between the passive and active remedies (both price and non-price), the lower the risk relative to an active-only regime. However, we recognise that there are likely to be variations in the extent to which the arbitrage opportunities can be mitigated... and so the design features of any passive remedy will be important in determining the scale of risk to investment.*"<sup>182</sup>

Ofcom express that they will, therefore, take this into account in its pricing analysis (noting that in general a higher price would be more likely to reduce any risks) and in the non-price design aspects.<sup>183</sup>

#### *Our response*

Ofcom's arguments in relation to arbitrage on the basis of density of network use and circuit length rely heavily on its assumption that there will only be one-for-one substitution and that pricing can be set on a per-circuit basis. In relation to the impact on the bandwidth gradient, it is correct that the higher the price of passives the less chance of arbitrage against that price, yet this does not mean that Ofcom's chosen price will mitigate all arbitrage opportunities. Alternatively, if the price is so high as to prevent all arbitrage there is unlikely to be any take up at all.

<sup>179</sup> See paragraph A 24.83 of the consultation document.

<sup>180</sup> See paragraph A24.87 of the consultation document.

<sup>181</sup> See paragraph A24.89 of the consultation document.

<sup>182</sup> See paragraph A24.92 of the consultation document.

<sup>183</sup> See paragraph A24.94 of the consultation document.

On the risk of stranded assets, Ofcom again supposes this could be addressed through the design of the passive and active pricing regime and that the impact would be insignificant. This hinges on non-specific proposals and no qualitative or quantitative analysis or evidence is provided to support this view. We understand from BT that this is likely to be a significant issue, especially for stranded assets on 10Gbit/s and very high bandwidth services, where Openreach has invested significant CAPEX. Contrary to the views expressed by Ofcom, BT consider that EBD can indeed be targeted for DF substitution and the assets could rapidly become stranded.<sup>184</sup>

Ofcom has largely dismissed the impact on investment incentives on other infrastructure providers, again outlining that this could be mitigated with the correct pricing approach: *“while passive remedies may undermine some investment relative to an active-only regime (particularly if it replicates the benefits of self-build), providing the passive remedy is designed appropriately (including in relation to form and price), it is not clear that this should have significant adverse effects for overall dynamic efficiency... in general a higher price would be likely to reduce the risk”*<sup>185</sup>

This issue is particularly relevant to the incentives faced by other infrastructure providers (such as City Fibre and Virgin Media) in areas where there is sufficient local concentration of demand to make alternative infrastructure competition a possibility. Ofcom’s proposed form and price for passives does not account for the fact that in such areas, it is possible that there is sufficient demand for services such that CPs using DF could run multiple EAD-type services over one fibre. By aggregating a number of services over a single fibre, the effective price drops significantly and will place a constraint on the returns of alternative infrastructure providers already operating in these areas, or the incentives to build new infrastructure. Even where such arbitrage is only a risk, this will still affect infrastructure investment incentives.

The issues associated with the availability of DF in these ‘prospectively’ competitive areas demonstrates the consequences of Ofcom’s geographical market definition. Ofcom has overlooked this possibility given its assumptions that where substitution between active and DF takes place it will be one-for-one and has therefore underestimated the potential for such arbitrage taking place in such areas.

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<sup>184</sup> See section 17 of BT’s response to the consultation document.

<sup>185</sup> See paragraph A24.93 of the consultation document.

## A.1.2 Allocative efficiency

### *BT's current active pricing structure*

Ofcom re-states its view that there can be benefits to allowing BT some flexibility in cost recovery, the consequence being that some services contribute more to common cost recovery on a per-circuit basis than others. However, several respondents to the previous consultation (in November 2014) questioned the efficiency of BT's current pricing.

Recognising that pricing efficiently is not the only incentive that BT has (noting that BT's choice to concentrate price reductions in recent years on 1Gbit/s services in particular, possibly illustrating a desire to migrate customers to higher bandwidths and increase revenues), Ofcom maintains that in principle the bandwidth gradient is likely to be more allocatively efficient relative to a flat gradient. It does not seek to take a view on whether the current active pricing structure is definitively efficient or otherwise.<sup>186</sup>

Ofcom state that "*... we focus on the potential impact of passive remedies on the current active pricing structure and the effect of any potential change, so we can then assess this impact (along with other costs/risks) relative to the benefits of passives, to inform our overall assessment of passives.*"<sup>187</sup>

### *Potential impact of passive remedies on BT's common cost recovery*

With the current active pricing structure, a passive remedy could allow CPs to undercut BT's prices on higher margin services, and Ofcom consider that BT could lose a greater contribution to fixed and common costs from the active circuit than it makes up for the passive access that replaces it. Thus, there could be implications for BT's ability to recover common costs if passives were introduced and active prices were unchanged.<sup>188</sup>

Ofcom note that the impact will depend on:<sup>189</sup>

- the form of the passive remedy – arbitrage opportunities and thus the risk to BT's common cost recovery is likely to be greater for duct access than for DF.
- the scope of the passive remedy – geographical limitations on use of passives may reduce take up, thus reducing substitution of actives.
- pricing of the passive remedy – "*... this will affect the offsetting contribution to fixed and common costs that the*

<sup>186</sup> See paragraphs A24.140 – A24.143 of the consultation document.

<sup>187</sup> See paragraph A24.144 of the consultation document.

<sup>188</sup> See paragraph A24.147 of the consultation document.

<sup>189</sup> See paragraph A24.149 of the consultation document.

*passive remedy will make as well as the scope for arbitrage opportunities under the current active pricing structure.”*

Of particular importance is Ofcom’s recognition that, “[w]hile the design of the passive remedy may be able to limit the scale of common cost recovery at risk if BT’s active pricing structure remains unchanged, we do not think it is possible to design a remedy that has no impact at all. Therefore we would need to be mindful of the potential need to make an adjustment to any active charge control that is imposed in order to continue to provide an opportunity for BT to recover its efficiently incurred costs.”<sup>190</sup>

*Potential changes to BT’s existing active pricing as a result of passive remedies*

Passives would lead to a rebalancing of active prices to reduce the arbitrage opportunities available. Ofcom “*would seek to adjust any active charge control to allow this, both to allow BT to respond to competition based on passive access...and to support common cost recovery overall.*”<sup>191</sup>

Ofcom outlines that price rebalancing could be in the form of price reductions for actives facing competition from CPs using passives (i.e. high bandwidth services); price increases where passive-based competition is limited; and/or geographic de-averaging/rebalancing of active prices to reflect different circuit lengths and customer densities so as to reduce associated arbitrage opportunities. Given that the scale of any rebalancing will be affected by the scale of cost recovery at risk, Ofcom considers that “*careful design of any passive remedy and appropriate adjustments to any active charge control*” together with some active price rebalancing would largely mitigate the risk to BT’s common cost recovery.<sup>192</sup> However, “*The key risk in relation to allocative efficiency is in relation to the distributional impact of this price rebalancing and what impact this may have on overall output.*”<sup>193</sup>

*Impact of price rebalancing*

To determine the likely distributional impact, Ofcom needs to consider the counterfactual, which it considers to be a comparison between “*the world with passive remedies and without at the same point in time (i.e. relative to today’s prices is not the correct comparison).*”<sup>194</sup> Ofcom considers that given the trend for BT to be flattening the bandwidth gradient overtime in any case, if this pattern continues there would be a flatter gradient by the time passives are introduced, relative to today’s prices and the effect will be smaller. However, where prices for low bandwidth circuits rise,

<sup>190</sup> See paragraph A24.150 of the consultation document.

<sup>191</sup> See paragraph A24.154 of the consultation document.

<sup>192</sup> See paragraph A24.156 of the consultation document.

<sup>193</sup> See paragraph A24.157 of the consultation document.

<sup>194</sup> See Paragraph A24.158 of the consultation document.

Ofcom acknowledge that this will have a negative impact on CPs who have invested on the basis of BT's current portfolio of regulated access services.

The scale of the impact will depend on the design of the passive remedy and Ofcom believes it can be managed as such. Even in the case where rebalancing could exacerbate common cost recovery concerns (i.e. in the case where higher prices on lower bandwidth services lead to a reduction in demand) Ofcom believes this risk is "manageable" and that any scale of rebalancing and the volume effect may not be significant relative to an active-only regime.<sup>195</sup>

*Potential implications of passive remedies for other markets*

Ofcom considers that there will only be a significant impact in other markets if passive remedies would have a significant effect on volumes i.e. where there is sufficient scope for aggregation with a passive remedy which is not possible under the active regime (which would lead to a reduction in absolute volumes in the business connectivity market).

*Under DF, there would be "more limited opportunities for aggregation beyond those which already exist and are available with existing aggregation products...it is not clear that the introduction of dark fibre would significantly reduce usage of BT circuits, such that more common costs needed to be recovered from other markets."*<sup>196</sup>

*Ofcom conclude: "...we consider that through a combination of careful design of any passive remedy and appropriate adjustments to any active charge control (if appropriate), it should be possible to limit the scale of active price rebalancing necessary as a result of introducing passive remedies. This would reduce the distributional effect by limiting upward price changes for lower bandwidth circuits...while also mitigating the risk to BT's common cost recovery."*<sup>197</sup>

*Our response*

Ofcom considers that the bandwidth gradient is more likely than not to be allocatively efficient and seeks to implement passive remedies in such a way that would be least disruptive to the existing pricing regime and allow for BT to make adjustments to its cost recovery schedule should it need to adjust active access prices in response to competition based on passive access.

However, it is clear that the price of all active services above 1Gbit/s will be constrained by the price of dark fibre and 1Gbit/s active services and BT will have to adjust the bandwidth gradient to ensure it continues to recover common costs. Even though Ofcom has sought to provide flexibility to adjust its prices, there will

<sup>195</sup> See paragraph A24.163 of the consultation document.

<sup>196</sup> See paragraph A24.168 of the consultation document.

<sup>197</sup> See paragraph A24.171 of the consultation document.

inevitably be a shift away from the current pricing structure which Ofcom itself has acknowledged to be allocatively efficient.

In any case, BT's ability to continue to recover its common costs will depend on the extent to which active circuits (at all bandwidths) are cannibalised. Ofcom places emphasis on the fact that the impact will depend on BT's ability to recover its efficiently incurred costs and as such it may need to make an adjustment to any active charge control to allow for this. Yet the specifics of the active price control are deferred to the LLCC consultation.

In the LLCC Ofcom consider that as a result of DF, BT may see a reduction in volumes of active products and will therefore lose the cost contribution made by these circuits. It is true that some of the costs will be avoidable (no longer incurred), but some costs will still be incurred irrespective of whether an active circuit or DF is provided – these will need to be recovered.

Ofcom considers that in "many cases", these non-avoidable costs will be offset by sales of DF and in those circumstances no adjustment will be required. Ofcom assumes a one-for-one substitution between active circuits and the DF remedy and this considers that DF will make the same contribution as the active circuit it had cannibalised. Therefore it considers that there is not a cost recovery concern for cannibalised circuits and that BT would be indifferent between providing an active circuit or DF for these circuits.<sup>198</sup>

Note, that if passives are introduced, it is possible that take up will also arise for services at bandwidths below the 1Gbit/s reference product. Even if Ofcom makes the adjustments it has put forward in the LLCC to allow BT some extra room for recovery of common costs, it has only taken into account loss on those circuits with bandwidths greater than or equal to 1Gbit/s and has ignored aggregation possibilities. Ofcom should not underestimate the extent to which aggregation would take place and it is not necessarily the case that there are limited opportunities for aggregation beyond those already available with actives. Ofcom's assumption that there will only be one-for-one substitution also has implications for its assessment of adjustments needed to the active access pricing regime to allow BT to recover its costs. There may well be an impact on cannibalisation of BT circuits in other markets where there is an impact on volumes due to increased aggregation possibilities.

Furthermore, if the reference product for DF stays as EAD 1Gbit/s even as demand for higher bandwidth services increases in the future, there will be a larger number of active services that will be

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<sup>198</sup> See 6.94 of the LLCC consultation.

constrained by the price of DF, and potentially larger number of cannibalised circuits as business customers shift to using DF to meet their high and very high bandwidth demand. BT will need further flexibility to adjust its prices of other active circuits than is currently provided in the proposals for the active price control.

Finally, as Ofcom recognise, the impact on cost recovery and rebalancing depends on take-up, but Ofcom is arguing elsewhere that the take-up of passives could be significant, otherwise it would not be able to allow wind back the active remedies. Therefore, there seems to be little ground for Ofcom to simply dismiss the scale of any rebalancing effects on the basis that this is manageable and not be significant relative to an active-only regime.

### A.1.3 Productive efficiency

Although there is a risk of inefficient entry as a result of passive remedies, Ofcom consider that this is related directly to the pricing of passive access (in absolute terms and relative to active prices). Furthermore, Ofcom considers that this risk is not unique to passive remedies and similar concerns about distorting build/buy decisions are relevant for all access prices.

Ofcom note that “...*the relativity of passive prices to actives could potentially raise a concern in relation to the efficiency of entry, as if not set appropriately, it could result in inefficient investment signals between different levels of the value chain with the incentives to enter using active and/or passive remedies (and/or self-build) potentially being distorted.*”<sup>199</sup> However, Ofcom does not necessarily believe this to be an issue as it considers the risk of inefficient entry can be limited if passive prices are set ‘appropriately’.

#### Our response

Ofcom’s arguments rely on it setting the passive access price ‘appropriately’ such that efficient investment signals are provided. However, as we discussed in section 4.1 of this report, Ofcom’s current pricing regime proposals (EAD-minus) are unlikely to capture all of the necessary costs (including lost margins to BT) and as such there may still be risk of inefficient entry.

Although Ofcom suggests that the passive product can be priced to avoid cherry picking, there remain some concerns as Ofcom has been conservative in identifying competitive supply areas. Therefore, we would expect that there will be areas where an OCP might have been willing to invest itself, but DF would be used instead due to the pricing of DF being geographically averaged and

<sup>199</sup> See paragraph A24.178 of the consultation document.

would not be fully reflective of costs affecting factors such as circuit length.

## A.1.4 Structure of competition in the market

Although recognising that if economies of scale are important in the use of passives, the downstream market could become more consolidated, Ofcom consider that the risk is small with DF: “... *the additional investment required by CPs for dark fibre is relatively low compared to current active products, and is mainly confined to different circuit interfaces*”.<sup>200</sup> Ofcom also note that in fact, passives could lead to increased wholesale competition upstream (meaning smaller CPs will have greater choice of supplier of active services). Further, Ofcom does not see why arguments that industry may become dependent on on-going regulation is greater with passive remedies than with existing active-based regulation.

Ofcom conclude: “*We recognise the possibility that there may be some changes to the market structure and competitive environment (for example, we could see the emergence of passive-based wholesale competitors and alternative, more differentiated offerings), but we do not think that there is a high likelihood of a large impact or that the impact would be to reduce competition.*”<sup>201</sup>

### *Our response*

In relation to industry becoming dependent on passive access, as we discussed in our response to the Preliminary Passives consultation,<sup>202</sup> if passive products are taken up, they involve services that cannot be withdrawn easily at some later point in time. CPs may make complementary investments linked to passive products and might not be able to shift back readily to active access services. A decision to introduce passive remedies is, therefore, largely irreversible (or at least so costly to reverse as to be impractical) once passive products are taken up to any significant degree. At the same time, both costs and benefits are uncertain. As this is an irreversible decision made under uncertainty, it is appropriate to apply the precautionary principle, where steps are made to control potential damage.

More generally, Ofcom’s suggestion that there would not be a significant change in the structure of competition seems to

<sup>200</sup> See paragraph A24.184 of the consultation document.

<sup>201</sup> See paragraph A24.188 of the consultation document.

<sup>202</sup> See DotEcon, Business Connectivity Market Review: Passive Remedies. Submitted as an Annex to BT’s response to the November Consultation. Available at: [http://stakeholders.ofcom.org.uk/binaries/consultations/bcmr-passives/responses/BT\\_Annex\\_6.pdf](http://stakeholders.ofcom.org.uk/binaries/consultations/bcmr-passives/responses/BT_Annex_6.pdf)

contradict what it is hoping for when assessing the benefits and considering 'innovation' over DF through the benefits. Further, Ofcom has not taken into account how buyer behaviour for DF will be different from that under actives. For example, it does not take into account that DF can be used for other purposes e.g. as part of a new NGA network and the possible incentives and buyer behaviour of CPs as a result. It has not considered the possibility of a disruptive product in the market. It cannot be assumed that DF will be used by CPs to provide services of a similar purpose to BT's active services, and Ofcom must consider the dynamic incentives for OCPs. There is a high level of uncertainty about how exactly the DF product could and would be used by CPs and there is a risk associated with relying too heavily on any particular assumptions in the absence of any credible evidence about buyer behaviour.

### A.1.5 Implementation costs

Ofcom agree that a new remedy would require BT to incur some development and implementation costs. It considers the need to provide BT with the opportunity to recover efficiently incurred implementation costs and do so in the LLCC consultation. However, it also notes that the scale of these costs is highly dependent on the specific design of the remedy and that a DF remedy which is largely mapped to the existing active circuits would have significantly lower implementation costs than a remedy based on duct access.

Ofcom largely dismiss the implementation costs on the basis that they are unlikely to be significant (see table 7.1), given that they would seek to provide BT with an opportunity to recover efficiently incurred implementation costs through possible changes to the active access regime.

Ofcom outlines its specific proposals in the LLCC consultation. It estimates the costs of implementation to BT and then proposes to uplift the Ethernet basket cost forecast to reflect for this so as to ensure the BT recovers its efficiently incurred costs.<sup>203</sup>

## A.2 Setting the pricing structure to mitigate the risks

In Annex 26 Ofcom sets out its view on the pricing approach for the DF remedy, importantly, noting that it considers "*how these might*

<sup>203</sup> See paragraphs 6.104 onward of the LLCC consultation.

*be used to minimise the potential distributional impacts and arbitrage effects discussed in Annex 24 – Impacts and Risks of passive Remedies.*<sup>204</sup>

Having dismissed the ‘no specific pricing obligation’ and the ‘FRND’ options, Ofcom focuses on the charge control option based on either a cost-based approach or a value-based (‘active-minus’) approach (setting passive access charges equal to the price of an active service (or basket of services) minus the relevant incremental costs attributable to the active service).

Ofcom then assesses the extent to which each of these pricing approaches can successfully mitigate each of the risks identified, as well as assessing the compatibility with the current active price structure, the risk of gaming and the ease of implementation. Given that Ofcom has chosen the ‘active-minus’ approach, we focus on its qualitative assessment of that option.<sup>205</sup>

*Allocative efficiency*

Ofcom consider that – to the extent that the current pricing structure supports allocative efficiency - taking an active minus pricing approach with a single active reference product would be a favourable approach, as some element of demand based pricing will be preserved (at least for lower bandwidth circuits). However, it notes that there will still be some reduction in the level of demand based pricing and costs recovery: *“This could result in some loss of allocative efficiency as the need to recover common costs no longer recovered on circuits above the benchmark bandwidth can be expected to lead to somewhat higher prices for lower bandwidth products.”*<sup>206</sup>

*Productive efficiency*

Overall the single active reference product scored less favourably on Ofcom’s productive efficiency criteria because it limits the use of passives to some extent. Although possibly desirable from other perspectives, Ofcom considers that on productive efficiency alone it leads to worse outcomes than the other two approaches.

*Dynamic efficiency*

For dynamic efficiency in the passive layer, Ofcom begin by noting that whilst BT *“should be in a position to recover its efficiently incurred costs by rebalancing prices within the cap to the extent that this is needed to maintain overall returns”*, other competitive CPs may not be in the same situation. For these competitive CPs, Ofcom considers that there is a risk that there would be lower prices and/or lower utilisation of the CP’s passive infrastructure, lowering profits. This would lower expected return on any new duct or fibre

<sup>204</sup> See paragraph A26.1 of the consultation document.

<sup>205</sup> Ofcom notes that: *“As it is not possible to quantify the merits of the different options and there are many factors to take into account, the exercise is necessarily qualitative.”* See paragraph A26.101 of the consultation document.

<sup>206</sup> See paragraph A26.107 of the consultation document.

construction, thus lowering incentives to invest – a potential loss to dynamic efficiency.<sup>207</sup> Ofcom considers that this impact would be larger for the cost and active basket based access prices given that those approaches favour wider use of passives and lower access prices.<sup>208</sup>

In relation to BT's incentives, Ofcom does not expect material negative effects regardless of the passive pricing approach used. In its opinion, BT's return on investment would be preserved via maintenance of BT's opportunity to recover efficiently incurred costs.<sup>209</sup>

*Compatibility with the current active price structure*

Ofcom considered the compatibility with the active price structure and the risk of arbitrage. Note that it assesses compatibility with its **current approach** to applying charge controls to BT's active leased line products and considers the extent to which the passive pricing approach preserves the stability of the **current regulatory regime**. Whilst Ofcom considers the single active reference product approach to be the most compatible of the three options presented, given that it would be based on a relatively high value benchmark product, reducing the bandwidth gradients on products with higher bandwidth than the benchmark, but with a smaller impact on lower bandwidths. Although it considers there is potential for some form of bandwidth gradient to remain in the market, Ofcom maintain that it does not exhibit a high degree of compatibility with the current active price structure.<sup>210</sup>

*Risk of gaming*

Ofcom assesses the "risk that the remedy might be less effective than intended as a result of the regulated firm manipulating the chosen pricing methodology in ways that favour itself", and finds that the highest risk comes in the case of the single active reference product given that BT could:

- have an incentive to price the active reference product in a way that disadvantage or discourages passive access seekers; and
- launch active products similar (but not identical) to the reference product.

Given the risk of gaming, rated it less well than the other options on this measure<sup>211</sup>

<sup>207</sup> See paragraph A26.125 of the consultation document.

<sup>208</sup> See paragraph A26.127 of the consultation document.

<sup>209</sup> See paragraph A26.126 of the consultation document.

<sup>210</sup> |See paragraph A26.132 of the consultation document.

<sup>211</sup> See paragraph A26.135 of the consultation document.

*Ability to implement*

For ease of implementation, Ofcom considers that the reference product approach (whether a basket or individual product) would be relatively easy to implement given that it is *“in principle a mechanical exercise once the products in the basket are specified.”*<sup>212</sup>

*Favoured pricing approach and choice of benchmark product*

Ofcom concludes that: *“...the use of a single reference product...has the potential to mitigate some of the allocative efficiency impacts as well as the impacts on other infrastructure providers...we acknowledge that the choice of a single reference product with a relatively high common cost contribution may reduce some of the benefits, in terms of innovation and productive efficiency, relative to an approach which uses a lower passive price.”*<sup>213</sup> Given the need to price DF to *“...provide a link between a suitable downstream active product and the fibre access price that then maintains a similar level of contribution to common costs and allows some preservation of the bandwidth gradient”*<sup>214</sup> Ofcom chooses EAD at 1Gbit/s as the benchmark product and considers there should be separate passive access charges for DF circuits equivalent to EAD LA and standard EAD circuits.

## A.3 Our response

Ofcom has suggested in several places that the impacts/risks of passive remedies can be simply ‘designed out’ when designing the passive remedy, the pricing of the passive remedy and, where necessary, making adjustments to the active access remedy. However, it is clear, even from the brief summary of Ofcom’s assessment above, that the active-minus approach with a single reference product would still have some costs e.g. in particular in relation to productive efficiency and the impact on investment incentives for other CPs. Despite this, Ofcom concludes that a passive regime with pricing based on an ‘active-minus’ basis with a single reference product (EAD 1Gbit/s) would present the best balance of costs and risks and is therefore preferable.

Ofcom’s assessment that this approach would mitigate all significant costs associated with the introduction of passive remedies is questionable. In fact, there are several important factors that Ofcom has failed to consider each of which will have a material impact on the scale and scope of the impact of introducing passive remedies in line with its proposals. The proposed ‘active-minus’

<sup>212</sup> See table A26.7 of the consultation document.

<sup>213</sup> See paragraphs A26.145 – A26.146 of the consultation document.

<sup>214</sup> See paragraph A26.149 of the consultation document.

approach put forward by Ofcom does not capture fully the costs faced by BT. We show that the active-minus price would need to take into account more than just the incremental costs associated with the provision of the active service in order to ensure that the contribution to BT's common costs made by purchases of either DF or the active product would continue to be the same, and to ensure that the efficient price is set for CPs.

## Ofcom's pricing approach does not mitigate the risks

As we discussed in detail in section 4.1 of this report, Ofcom cannot simply assume that many of the costs associated with the introduction of DF will be reduced to zero if it applies a pricing rule taking an 'active-minus' approach with a single reference product.

In setting out the details of the 'active-minus' approach, Ofcom does not appear to have fully captured the risks of margin erosion that would arise from take up of passive remedies. There are two main issues that Ofcom has overlooked when considering the impact of DF with an 'active-minus' pricing structure (and which would lead to lost margins for BT that are not accounted for in the simple active-minus approach):

- the undermining of high bandwidth services – DF can sustain services higher than 1 Gbit/s so BT will lose margins on these higher bandwidth services (Ofcom has considered some adjustments in the LLCC consultation even though the issue was not raised in the BCMR documents);
- aggregation of services – Ofcom has assumed that there will be a simple one-for-one substitution between actives and passives. In this case, active services below 1Gbit/s will also be potentially subject to switching to passives with associated lost revenues (this has been overlooked by Ofcom).

## Adjustments made in the LLCC

We recognise that in the LLCC consultation, Ofcom has outlined in detail the costs it is taking into account for the active-minus approach to pricing of DF and the adjustments it proposes to make to the active access pricing regime. Taking into account the arguments presented above, we consider the extent to which Ofcom has fully accounted for our concerns about the need to capture fully the likelihood of margin erosion from both undermining of demand for active services and aggregation possibilities.

### *Deducting the incremental costs*

For the active-minus proposals Ofcom chooses to take LRIC as the cost standard when calculating the differential. It considers a range

of 'super components' that should be classified as a incremental cost of active services, and concludes that the following should be considered:<sup>215</sup>

- Ethernet electronics
- Service Centre (Assurance) – allocate share to active services using share of active fault volumes;
- Sales Product Management – allocate share to active services using share of active incremental costs relative to EAD cost stack
- Revenue Debtors – allocate share to active services using share of active incremental costs relative to EAD cost stack.

In addition to super component costs Ofcom also considers the following categories of costs:

- non domestic rates – are paid by the *"person who lights the fibre"* therefore they are an incremental cost of active services and should be deducted when calculating the DF price.
- differences between the DF RO and the benchmark EAD services – BT should adjust the access price for the DF product to take account of the difference in incremental costs associated with the identified differences between the active and DF products (e.g. differences in processes, systems or in the physical nature such as differences in fault repair processes and potentially some new handover arrangements for the termination of DF segments).
- provisioning, repair and migration charges – *"to the extent that there is a corresponding charge for the EAD 1Gbit/s active service, we would expect that the corresponding charge for the dark fibre equivalent would be based on that charge, minus any costs avoided by not providing the active service."*<sup>216</sup>
- New infrastructure and ECCs, TRCs and accommodation costs – *"we propose that the existing charging arrangements for (active) network extensions would provide the most suitable solution for the dark fibre service."*<sup>217</sup>

Where leased line services require two fibres to provide a single downstream service, Ofcom proposes to set the price based on a single fibre service, adjusted for any incremental cost savings to BT from supplying multiple fibres.

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<sup>215</sup> See table 8.2 of the LLCC consultation

<sup>216</sup> See paragraph 8.75 of the LLCC consultation.

<sup>217</sup> See paragraph 8.77 of the LLCC consultation.

*Ofcom does not make allowances for all relevant opportunity costs in the 'active-minus' price*

Ofcom is not considering the opportunity costs faced by BT, as would be required according to the general principles behind the ECPR. These opportunity costs should be assessed against a counterfactual that the regulatory structure for active services has been optimally designed. On that assumption, they would need to include the lost gross margin (and so contribution to common costs from) all of the various active services affected by the introduction of a passive product, including both the effects of lost volumes and pricing changes. However, a proper estimation of the opportunity costs is very difficult and there is some uncertainty about how exactly to capture all these costs in a simple pricing approach. This does not mean that such opportunity costs can be ignored but undermines the idea that an EAD-minus approach can be used.

In its assessment Ofcom assumes that these lost gross margin, lost volume and pricing effects are unrealistically limited, as we explain below.

Ofcom considered that as a result of DF, BT may see a reduction in volumes of active products and will therefore lose the cost contribution made by these circuits. Some of these costs will be avoidable (no longer incurred) but some costs will still be incurred irrespective of whether an active circuit of DF is provided – these will need to be recovered. Ofcom considers that “*in many cases*”, these non-avoidable costs will be offset by sales of the proposed DF remedy and in those circumstances no adjustment will be required. As such, it concludes that there is not a cost recovery concern for cannibalised circuits and that BT would be indifferent between providing an active circuit or DF for these circuits.

*Ofcom's one-for-one substitution assumption is invalid*

However, this conclusion is critically based on the assumption that there is a one-for-one substitution between active circuits and the DF remedy and thus Ofcom considers that DF will make the same contribution as the active circuit it had cannibalised. We consider that this is a fundamentally flawed assumption given the realities of the market and the incentives that CPs will be faced with.

Ofcom does consider if there will be any other circuits (apart from EAD 1Gbit/s and EAD LA 1Gbit/s) that will face cannibalisation and would require adjustments to ensure BT can recover these efficiently incurred costs.<sup>218</sup> Ofcom consider cannibalisation of both OSA 10Gbit/s services and EAD 10Gbit/s services for both internal and external circuits. Assuming cannibalisation of new connections (and associated rentals) only, Ofcom compare the contribution from connection plus one year's rental for the active circuit and the proposed DF in 2018/19. Given that BT would be unlikely to recover these costs elsewhere, Ofcom proposes to

<sup>218</sup> See paragraph 6.98 of the LLCC consultation.

include these non-avoidable cost differentials between the proposed DF and cannibalised active circuits into the Ethernet basket cost forecast and estimate this to require an additional £4.6 million in the Ethernet basket FAC in the final year of the charge control.<sup>219</sup>

*Ofcom has made some adjustments, but there are some concerns*

We welcome that Ofcom has made adjustments to allow BT to recover these costs, however we raise two main concerns. First, whilst this approach is better than no adjustments at all, it is highly ad hoc and is potentially storing up a large problem for the future as bandwidth demand grows and more people shift to requiring services at bandwidths greater than the 1Gbit/s reference product meaning there will be even greater cannibalisation and a larger upward adjustment to the Ethernet basket FAC. It is highly unlikely to lead to pricing that is set 'correctly' and Ofcom need to consider the risk of inefficient outcomes if the price is wrong; this does not feature in Ofcom's assessment.

Second, even if we were to accept that Ofcom's approach to making adjustments is appropriate, when making this adjustment, Ofcom should also consider the extent to which there will be cannibalisation of active circuits below 1Gbit/s. As outlined above, and as stressed by BT in its response, there are distinct possibilities that some CPs will take advantage of the ability to aggregate and will switch away from lower bandwidth services given that they could provide multiple services over a single fibre, even in the short run, and thus further adjustments may be needed to account for this over this charge control period.

## Ofcom's approach is not future proof

Notwithstanding the above, there are some additional costs that Ofcom has not fully accounted for when considering the costs and benefits associated with proceeding on its proposed basis. This includes the consideration that setting prices with reference to a single active product does not appear to be a sustainable approach. For example, it is entirely likely that the benchmark product will decline in importance over time.

Ofcom does acknowledge that its active minus approach is not necessarily future proof and there may be issues associated with migration of the benchmark product over time. However, it considers that they would be able to make adjustments for this at the next market review: *"this issue would need to be addressed in the next price control review period. We note that at that time it is possible*

<sup>219</sup> See paragraphs 6.99 – 6.103 of the LLCC consultation.

*that improved passive cost data might have become available, and that market pricing may have developed in ways that impact the analysis. We would therefore expect that the next price control review would need to reconsider whether to continue with an active minus reference price approach (and if so what that reference product and price should be), or whether to move to a more cost based approach.”<sup>220</sup>*

There is a legitimate concern regarding locking in the current generation of active services and what happens if these change. If Ofcom maintains the same reference product (at 1Gbit/s) over a long period of time, then some of the benefits that Ofcom puts forward to justify passive remedies will reduce over time. For example, Ofcom recognises that the bandwidth gradient on active products (which it considers to likely to be more efficient than a flat pricing structure<sup>221</sup>) would only be reduced for products of higher gradient than the benchmark product (of which there are relatively few). Given that there will be a smaller impact on all other lower bandwidth products, Ofcom found the active minus approach based on EAD 1Gbit/s to be preferable in terms of compatibility with the active pricing structure. Notwithstanding our arguments above that even in the short-medium term there may be incentives for OCPs to use DF to provide multiple lower bandwidth services over a single fibre, in the medium/long term it is likely that higher bandwidth circuits will account for a higher proportion of active revenues and thus there will be a greater convergence towards a flat bandwidth gradient, which is less efficient.

Simply asserting that this could be considered at the next pricing review understates the importance of this issue and the potential impact on investment incentives (which Ofcom has not included in its assessment of the dynamic efficiency impacts when considering the costs/risks). There are potential negative impacts on investment incentives due to regulatory uncertainty. For example, if the reference product or pricing approach is likely to change at next market review, then this raises regulatory certainty issues, which could dampen the investment incentives of CPs who expect the price to change for better or worse, and limit the benefits on which the introduction of DF is based on. It is important therefore, that Ofcom can set a price for DF that will, with some certainty, remain constant over a relevant time-scale linked to the investment appraisal timeline and/or the asset life of products to be used by CPs accessing DF (both of which are likely to extend beyond the next review period and even the life of EAD). For this reason, it

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<sup>220</sup> See paragraph A26.158 of the consultation document.

<sup>221</sup> See paragraph A24.143 of the consultation document.

would be preferable for Ofcom to adopt a future-proof approach to pricing now.

## Annex B Summary of Annex 23

### B.1 Summary of Ofcom's assessment of the benefits

Ofcom has considered the responses to its November Consultation and carried out additional analysis of the SoR requests and the potential cost savings from avoiding duplication of network equipment, including monitoring elements. Ofcom categorise the benefits into three main groups:

- dynamic efficiency in the form of greater scope for innovation and improvements in service quality;
- productive efficiency in the form of lower costs and prices over time as more of the cost stack is exposed to competitive pressure and as less equipment is used to deliver the services; and
- the potential to withdraw or relax some downstream regulation.

#### B.1.1 Dynamic efficiency benefits

Ofcom considers the consultation responses in relation to:

- product and service innovation;
- improvements in service quality;
- innovation in network design;
- responses in support of dynamic benefits; and
- responses raising arguments against dynamic benefits

Ofcom then presents its analysis in each of these areas (drawing on assessment of the scope for innovation with passive remedies in Annex 27 including analysis of the SoR process). The main points are summarised below.

#### *Product and service innovation*

Ofcom outlines some figures related to the SoR process since 2006, noting that only one third of requests have been successfully developed with the rest cancelled by the CP or rejected by Openreach. In Ofcom's view, 16% of the total number of SoR requests could have been developed by CPs themselves with a

passive remedy. Ofcom considers this to be evidence of the *potential* for passive remedies to give CPs the choice of whether to develop such services.<sup>222</sup>

Ofcom also notes the time it takes for such requests to be processed under the current regime, in some cases up to five years, acknowledging that this may be to do with the need to reach agreements amongst several CPs and the need to make the deployment available to all.<sup>223</sup>

Ofcom also considers that under the existing regime, “[t]he extent of innovation and service improvements seems to be limited because active products do not offer CPs complete end-to-end control, limiting CPs flexibility to differentiate those services.”<sup>224</sup> It notes that passive remedies would increase innovation by allowing CPs to configure and deploy their own equipment to better suit the needs of their customers, make technology choices and upgrades independently of BT and choose network equipment allowing them to introduce specific features they want.<sup>225</sup>

Ofcom does not put too much weight on arguments from BT, KCOM and Virgin that such innovations could be achieved by active services. Ofcom consider that instead, “*passive remedies have the advantage of giving CPs the sole responsibility for such developments, rather than requiring Openreach and CPs to coordinate.*”<sup>226</sup> Given that it considers one of the key benefits of passive is to allow first mover advantage, Ofcom considers that for this benefit to be realised under the active regime, the SoR process would have to be amended to allow a degree of differentiation that may be at odds with the EoI framework.<sup>227</sup>

Ofcom take a rather different view to that stressed at the time of the 2013 BCMR and the Colt Appeal, noting that it “[does] *not seek to take a view as to the specific innovations that would occur with passive remedies. Rather, we recognise that in principle access to passive inputs would give CPs the flexibility to differentiate, innovate and upgrade without being dependent on BT.*”<sup>228</sup> Ofcom consider that future innovation *may* emerge under passive remedies allowing CPs

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<sup>222</sup> See paragraph A23.81 of the consultation document.

<sup>223</sup> See paragraph A23.82 of the consultation document.

<sup>224</sup> See paragraph A23.84 of the consultation document.

<sup>225</sup> See paragraph A23.85 of the consultation document.

<sup>226</sup> See paragraph A23.86 of the consultation document.

<sup>227</sup> See paragraph A23.86 of the consultation document.

<sup>228</sup> See paragraph A23.87 of the consultation document.

greater flexibility to develop such innovation faster than under the current regime.

Further, Ofcom consider that if passives lead to increased competition in the active layer, this could incentivise BT to innovate in active circuits in order to maintain active volumes.

Noting that, if economies of scale are important in the use of passive remedies this could lead to some consolidation, this will depend on the form of the remedy and is far less relevant in the case of DF than in the case of duct access: *“the cost of using dark fibre would be much lower offering the small scale CPs more scope to take advantage of passive inputs directly by deployment their own active components [sic]”*.<sup>229</sup>

Ultimately, it considers that: *“...introducing passive access would ‘unlock’ increased innovation in the active layer, by allowing any downstream CP the opportunity to take on the risk and reward of investment through ownership of the active layer...passive remedies would allow CPs to be more responsive to end users’ needs as they would have greater ability to progress at their own pace...This in turn would put pressure on all operators (including Openreach) to innovate, driving greater dynamic efficiency.”*<sup>230</sup>

#### Improvements in service quality

Ofcom outlines its view that passive remedies would give CPs greater control of some aspects of quality, but also recognises that CPs would still be dependent on BT for the provision and repair of the passive components. Furthermore, they consider that passive remedies would not address problems that relate to the provision of underlying fibre circuits that support its active wholesale services (as opposed to the commissioning of the active equipment). However, Ofcom consider that there is some scope for improvements in service quality in the case where reported faults occur in the active layer as CPs could adopt their own fault management techniques without the need to rely on BT.<sup>231</sup>

The key issue discussed by Ofcom appears to be around the process for repair of fibre faults, which would need to be altered given that Openreach would no longer be monitoring circuits. However, Ofcom did not accept that a new process where CPs play a more active role in fault detection, would lead to longer times to detect and repair faults. In any case, they consider that any additional overheads associated with this process could be offset by improvements in handling faults that do not occur in the fibre,

<sup>229</sup> See paragraph A23.94 of the consultation document.

<sup>230</sup> See paragraph A23.95 of the consultation document.

<sup>231</sup> See paragraphs A23.96 – A23.99 of the consultation document.

especially as only a minority of faults reported to Openreach are actually fibre faults.<sup>232</sup>

*Innovations in network design*

Ofcom consider that a DF remedy would provide less scope than duct access to realise network architecture related benefits and given the need to rely on the SoR would have less scope to pursue the associated benefits independently of BT and other CPs.

However, Ofcom notes that both duct and DF would allow CPs to realise other benefits stemming from choice of network equipment including: reduced duplication of network equipment compared with active remedies; greater control over the specification of the equipment and services and features offered to end customers; and greater flexibility about the location of circuit end points.

Ofcom do consider some practical challenges associated with deploying networks in BT's ducts that would have different architectures to its tree and branch structure.

*Conclusions on dynamic efficiency benefits*

Ofcom's main conclusions on dynamic efficiency include:

- it is concerned that the SoR process constrains some developments and the pace at which they are delivered limit the scope for differentiation and innovation;
- passive remedies would give competitors more control over more elements of the network;
- competitors could make investment decisions and innovation choices independently of BT;
- greater competition in the provision of leased lines could increase innovation by allowing CPs to configure and deploy their own active equipment to better suit their customers' needs;
- differentiated access products would put pressure on all operators (including Openreach) to innovate, driving dynamic efficiency.

Comparing duct access versus DF, Ofcom consider that: *"the opportunities for innovation and competition from passive access lie in the active layer and that dark fibre therefore offers most of the innovation benefits of duct access."* Whilst there may be additional advantages to allowing CPs more control over the design and configuration of networks Ofcom considers that the benefits lie mainly in geographic expansion and it is *"far from clear"* that CPs could profitably utilise duct outside of a narrow range of locations.<sup>233</sup>

<sup>232</sup> See paragraph A23.100 of the consultation document.

<sup>233</sup> See paragraphs A23.113 – A23.114 of the consultation document.

## B.1.2 Productive efficiency benefits

Ofcom identifies two key issues in relation to productive efficiencies:

- *“the prospect of genuine competition on the merits, and the benefits this may have in the form of lower costs (and therefore ultimately, prices)”;*
- *“potential arbitrage opportunities created by the interaction of passive access products with the current active pricing structure, which may result in price reductions for some downstream services relative to today but which are not necessarily driven by cost-efficiencies.”<sup>234</sup>*

Ofcom commented on arbitrage in relation to the ‘costs and risks’ and focuses only on the first issue when considering the benefits.

Ofcom note that, *“passive access offers the potential to reduce the level of duplication of electronic equipment... In other words, with a passive remedy it is possible to use less active equipment to deliver the same leased line service.”<sup>235</sup>* Considering first, the equipment savings that could be made (e.g. no need for BT terminating equipment) and additional savings (less equipment means savings on electrical power, accommodation costs and lower system development costs) Ofcom then attempts to estimate the productive efficiency benefit.

### *Estimation of productive efficiency benefit*

Ofcom calculates an estimate of the cost savings by considering both the potential cost saving per circuit and the volume of active circuits that are likely to switch to passives (considering the circuits outside the CLA region in areas where dark fibre would be available).

Ofcom assume that in the short term, *“only new EAD circuits at and above 1Gbit/s are likely to switch to passives.”<sup>236</sup>* On this basis, it forecasts the volume of new EAD and EAD LA 1Gbit/s connections (outside CLA) in 2018/19. Combining with its estimates for the potential cost savings per circuit, Ofcom calculates the savings in the short run to be £3.5-7million.

Ofcom consider that in the long-run, all active circuits would switch to passive solutions. Based on a forecast of total EAD, EAD LA and WES circuits at 10Mbit/s, 100Mbit/s and 1Gbit/s up to 2018/19, Ofcom considers there could be potential equipment savings of up

<sup>234</sup> See paragraph A23.142 of the consultation document.

<sup>235</sup> See paragraph A23.146 of the consultation document.

<sup>236</sup> See paragraph A23.159 of the consultation document.

to £60-£120 million in the long run. Ofcom's active volume forecast for 2018/19 is used as a proxy for the regulated active circuits in the long run.<sup>237</sup>

However, as duplication of infrastructure is not necessarily detrimental (Ofcom recognises that full infrastructure competition has the greatest level of fixed-cost duplication but potentially the greatest scope for dynamic benefits), Ofcom consider that it is important to consider efficiency overall.

Ofcom do recognise that there is also a risk of some cost increases as a result of passives, including reduced economies of scale leading to higher unit costs in the case where passive remedies lead to reduced utilisation of BT's existing infrastructure. Ofcom note the risk of duplication and risk of reduced economies of scale will be influenced by the form of the remedy and the pricing. First noting that duplication is likely to be higher in the case of duct than DF, and that DF will better utilise BT's existing infrastructure. They also argue that *"providing the passive remedy is priced appropriately... CPs should in general only purchase passive access where they have cost advantages and/or the other benefits of passives outweigh any cost disadvantages"*.<sup>238</sup>

Ofcom concludes: *"While we recognise that there is a risk that passive remedies could lead to increased duplication and additional costs relative to an active-only regime, which could create productive inefficiencies, we consider that the cost savings opportunities we have identified are likely to outweigh this effect, particularly in relation to dark fibre."*<sup>239</sup>

### B.1.3 Potential to withdraw or relax downstream regulation

Ofcom considers that if the availability of passives allows CPs to replicate BT's downstream services, there is potential to withdraw or relax regulation of active remedies.

Ofcom note that *"active remedies are well established and CPs currently depend on BT's regulated wholesale services in all locations in which BT has SMP in the relevant markets, for all applications"* and that it is difficult to judge the true extent of demand for passives.<sup>240</sup>

<sup>237</sup> Ofcom, 9 July 2015, 'Clarifications and corrections to the Business Connectivity Market Review consultation document of 15 May 2015 and the Leased Lines Charge Controls and Dark Fibre Pricing consultation document of 12 June 2015', p 1.

<sup>238</sup> See paragraph A23.165 of the consultation document.

<sup>239</sup> See paragraph A23.168 of the consultation document.

<sup>240</sup> See paragraph A23.188 of the consultation document.

Moreover, the timescale to move to passive inputs will differ depending on a number of factors. For example, whether passives are in the form of duct access or DF, and whether passive inputs are used to change existing circuits or to build new circuits (with a faster transition in the latter case). Ofcom do consider however that *in principle* the introduction of passive remedies should provide scope for deregulation *in the long term*.

## B.1.4 Form of passive remedies and allowed use

Ofcom recap on the differing scale of the benefits in the case of passives in the form of duct access versus those arising from DF. Ultimately concluding that DF has the potential for wider take up than duct access, thus arguing that it would lead to greater potential benefits.<sup>241</sup>

## B.2 Our response

### *Productive efficiency benefits*

Ofcom considers that productive efficiencies will arise from the prospect of genuine competition on the merits leading to lower costs and prices. However, competition on the merits requires the 'right' access price so that only efficient entry occurs. As discussed earlier in this report, there is significant uncertainty that the prices can be set to provide signals for efficient entry only. The risk of inefficient outcomes if the price is wrong does not feature in Ofcom's assessment of the net-benefits/costs.

### *Quantifying the benefits*

In contrast to its approach to assessing the costs, Ofcom has actually sought to quantify at least some of the proposed sources of benefit. One key reported benefit is the productive efficiency saving that Ofcom considers amount to savings of approximately £60-100m in the long run.

There are two underlying elements to Ofcom's calculation. An estimate of the costs saved per circuit, and the number of active circuits that are switched to passives. On volumes, Ofcom has assumed that whilst in the short run, only new EAD circuits at or above 1Gbit/s would switch, in the long run all regulated active circuits are replaced with solutions based on passives (using the active volume forecast for 2018/19 as a proxy for the regulated

<sup>241</sup> See paragraph A23.256 of the consultation document.

*Any additional costs must be offset against the savings*

active circuits in the long run.)<sup>242</sup> Ofcom notes that, *"In the long-term, if all active circuits were to switch to passive solutions as contracts expire and demand for bandwidth grows, then the potential for efficiency savings is greater [than in the short-run]."*<sup>243</sup>

In terms of the estimated cost saving per EAD 1Gbit/s circuit for customer-to-network connections, Ofcom considers saved costs of: NTE, Headend common equipment, NTU, and 1Gbit/s short reach optical SFP.<sup>244</sup> The analysis conducted by Ofcom suggests that this saving comes largely from avoiding duplication of network monitoring elements. However, the scale of potential costs savings does not include any offset for the costs of equipment that would have to be added in place of BT's monitoring equipment or alternative methods of monitoring faults. Where a fully automated system is put in place, there will need to be an interface between the operations support systems (OSS) of the CP who is conducting real time monitoring, and Openreach's OSS to allow it to test the fibre should a fault be reported.<sup>245</sup> This may be difficult and costly, as we understand from BT that there is lack of standardisation in the APIs that allow CP equipment to report faults to BT, and until there is any particular standardisation, it is highly likely that BT will still have to have some sort of monitoring equipment attached to the DF. Other policies such as manually testing processes are likely to be costly, and unlikely to scale should DF see significant take up.

In order to provide a true quantitative assessment of the net-benefit of passives in terms of costs of equipment and saving, Ofcom ought to have off-set these cost savings with any of the additional costs that may arise from new monitoring systems and the costs of stranded assets and loss of economies of scale/scope in BT's network that Ofcom considered in its assessment of the costs and risks. Ofcom has acknowledged that there will be at least some costs associated with this: *"We recognise that it is not only fixed (passive) infrastructure investment which has the potential to be stranded, as there could also be active-specific investment (e.g. in the electronic boxes at each end of the leased line) which could become stranded."*<sup>246</sup> Even though Ofcom consider that this risk is likely to

<sup>242</sup> Ofcom, 9 July 2015, 'Clarifications and corrections to the Business Connectivity Market Review consultation document of 15 May 2015 and the Leased Lines Charge Controls and Dark Fibre Pricing consultation document of 12 June 2015', p 1.

<sup>243</sup> See paragraph A23.161 of the consultation document.

<sup>244</sup> See table A23.3 of the consultation document.

<sup>245</sup> BT discusses this issue in full in section 16 of its response to the consultation document.

<sup>246</sup> See paragraph A24.66 of the consultation document.

be relatively limited on the basis that the remedy could be designed to reduce the risk, it has not sought to quantify this.

Ofcom do acknowledge that *“we would expect the risk of such assets becoming stranded to be higher if migration from active circuits to passive access was permitted within-contract, since we would expect BT to recover such circuit-specific costs across its contract period. However, once this period has expired it is not clear the extent to which such assets would be stranded”*<sup>247</sup> and that *“in any event, we would seek to approach any pricing of both passive, and active remedies (if appropriate) in a manner which provided BT with an opportunity to recover its efficiently incurred costs. Further, this could include, where appropriate, an estimation of the efficiently incurred costs which may become stranded as a result of the new remedy, so as not to distort future investment signals.”*<sup>248</sup> We have discussed the implications of Ofcom’s adjustments in section A.2 above.

#### Innovation benefits

In addition to these productive efficiency benefits, Ofcom’s other ‘key benefit’ is ‘innovation’ suggesting that access to DF would allow greater competitive differentiation and faster development as well as stimulating the emergence of new technical solutions.<sup>249</sup> However, Ofcom is placing significant weight on this benefits whilst it has not provided any real evidence to demonstrate that any innovation benefits are significant or likely to emerge. The supporting evidence is weak and Ofcom does not appear to have placed any weight on the arguments made in our previous report that innovation possibilities are likely to be limited by industry standards often beyond the control of individual CPs.

Whereas Ofcom previously required strong evidence of exactly how CPs would use the services and on what and where they would make their investments,<sup>250</sup> Ofcom now seems to accept the ‘potential’ for innovation possibilities with little concrete

<sup>247</sup> See paragraph A24.66 of the consultation document.

<sup>248</sup> See paragraph A24.67 of the consultation document.

<sup>249</sup> See for example paragraph 1.30 of the consultation document.

<sup>250</sup> For example, Ofcom rejected the need to take further regulatory intervention in the form of introducing passive remedies on the basis that, *“...the case for doing so would depend on there being concrete evidence that the transition would lead to a better overall outcome for competition in the market along with evidence that CPs would invest substantially in competition using passive remedies.”* See paragraph 8.131 of Ofcom’s 2013 BCMR Statement.

evidence,<sup>251</sup> relying on SOR analysis and innovation on other networks that *may* provide using the Openreach network if passive remedies are made available.

We do not consider the specifics of Ofcom's innovation arguments in detail here as BT have considered the detail on this. However, there is great uncertainty about the extent to which the possibility of, and incentive for, such innovations rests on passive remedies. If the provision of some new service requires access to the network layer, then this necessarily involves the technical standards and functionality of network equipment and this will be reliant on innovation of equipment from vendors. That is, innovations themselves may depend on developments in network equipment for which there is a global market and manufacturing is subject to strong scale economies so timetables for upgrades are likely to be out of the control of individual CPs.

Even if access to the physical layer were to prove necessary to provide innovative services, or the equipment was available, it is plausible that customers for such services may already be in competitively supplied areas, limiting the role of passive remedies in facilitating such developments

#### *Deregulation*

Ofcom's third and final main benefit it assigns to DF remedies is that it could lead to a reduction or withdrawal of downstream regulation. For this to be true, the volume of passives would have to be significant and they would need to replace actives to some extent. However, Ofcom cannot then have it that passives do not run much risk. Similarly, given that the justification for introducing passives must be somewhat predicated on the fact that take-up may be significant, BT will need considerable flexibility to rebalance its active prices, something that Ofcom considers in the LLCC Consultation applying a range of assumptions on likely active circuit cannibalisation (albeit on an incorrect assumption that substitution will be one-for-one).

In any case, the ability to remove regulation is undoubtedly a very long term possibility that will only be incurred well beyond the current period of review. It is quite revealing that Ofcom has included this as a benefit, yet has chosen not to include in its assessment framework the costs of regulating concurrently at multiple levels of the value chain for a long period. Ofcom has not

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<sup>251</sup> For example at paragraph A23.87 of the consultation document, Ofcom state: *"We do not seek to take a view as to the specific innovations that would occur with passive remedies. Rather, we recognise that in principle access to passive inputs would give CPs the flexibility to differentiate, innovate and upgrade without being dependent on BT... We recognise that a wide range of future innovations may emerge and that passive remedies would allow CPs greater flexibility to develop these faster."*

made any adjustments in its assessment to account for any short-run effect in tightening up regulation.

If there really are likely to be benefits, these should be evident and the remedy should be justified on the grounds of specific issues that are not resolved with the existing regulation. Given our views that the costs and risks cannot be dismissed with any certainty, Ofcom is required to provide strong evidence of innovation benefits and quantify these against the costs within its balancing framework – we discuss this in more detail in section 4.4 and section 5 above.