Virgin Media's response to Ofcom's Business Connectivity Market Review Consultation - May 2015

10 August 2015

Non-Confidential Version

Business Connectivity Market Review

Summary

1.1 Ofcom's review of the Business Connectivity Market is a critical exercise: its outcome will have far-reaching consequences across the communications sector and for the UK economy in general, for years to come. In particular, it will serve as a key determinant of how private investors view the sector.

1.2 The executive summary to Ofcom's Strategic Review of Digital Communications (DCR) notes that there has been an *"explosion in new services"* over the last decade[1]. This, as Ofcom recognises, has resulted almost entirely from investment by network and service providers. Ofcom also notes that "*there are fresh challenges to meet [ ]…. In fixed telecoms, this is likely to need a new wave of investment in 'ultrafast' broadband*"[2].

1.3 It is well recognised that sustainable private investment in infrastructure, particularly in separate competing networks, delivers the best long-term outcomes for consumers and end users. Such investment is critically dependent on a regulatory environment that is encouraging of investment and stable. Ofcom itself notes in the DCR that "*[r]egulation needs to ensure consumers and the wider economy benefit from waves of private sector investment in successive generations of technology that is as widely available as possible*"[3]. The Business Connectivity Market Review (BCMR) presents Ofcom with a prime opportunity to secure such benefits for the long term.

1.4 However, in Virgin Media's view, this opportunity has not been taken. Rather, the proposals set out in the consultation send a negative message to investors in infrastructure and create a very real risk of restricting the flow of funds to communications network investment in the UK. Specifically, the intended imposition of a Dark Fibre Access (DFA) remedy will, in our view, serve only to undermine investment incentives and disrupt existing, competitive markets.

1.5 Above all, we do not consider that there is a case for the imposition of a DFA remedy. In particular:

- The competition problem that it is intended to solve is not clear. Ofcom's justification for its imposition is largely based on an expectation that it will deliver more benefits than active access remedies alone. This is not consistent with addressing a specific competition concern;
- There is insufficient evidence of the benefits of a DFA remedy. In addition, the disadvantages of such a remedy have been afforded an insufficient weighting and would, in Virgin Media's view, outweigh significantly the benefits;

[1] Ofcom Strategic Review of Digital Communications Discussion Document, 16 July 2015, para 1.1-1.2
[2] ibid, para 1.9
[3] ibid, para 10.1

- There is existing and growing competition for high bandwidth leased lines, the very sector of the market in which DFA inputs will be used. Moreover, competition between independent providers of infrastructure, including for DFA, is evident in many areas of the UK; and
- Ofcom's approach to market definition and assessment of competitive conditions is inconsistent with accepted industry precedent and even its own previous approaches. This has resulted not only in a perverse market structure, but also in SMP being been found in areas in which it is clear that there is both existing and prospective competition.

1.6 Even assuming there was a case for the imposition of a DFA remedy, we consider that the elements of the remedy that Ofcom has proposed to mitigate its disadvantages are inadequate. Specifically:

- The reference product against which Ofcom proposes to benchmark pricing for DFA is inappropriate. The use of a 1Gbit/s bandwidth product does not reflect the expected (and current) uses to which DFA inputs will be put. This will have the effect of devaluing the market for high bandwidth services generally and, as Ofcom itself admits, will cannibalise the high bandwidth active market;
- The proposed reference product would also result in a price point for DFA that is significantly below the current commercial price, removing value from the infrastructure market and undermining both existing and future investments;
- Ofcom has failed sufficiently to consider alternative pricing approaches that could be less damaging to the market – for example 'fair and reasonable', higher bandwidth reference products and commercial price benchmarking.

1.7 The imposition of a DFA remedy is not only unnecessary and disproportionate, but will very likely lead to long term negative consequences for the market and the sector as a whole. The apparent willingness of Ofcom to contemplate intrusive and disruptive regulatory intervention in a market that demonstrates growing competition sends a very negative signal to investors. This will likely deprive the sector of the very fuel which Ofcom itself identifies as critical to its future development and sustainability.

1.8 The investment that Ofcom seeks is already occurring – and at some scale. Virgin Media's £3bn network expansion programme, Project Lightning, is the largest investment in the UK's digital infrastructure for more than a decade. Other providers have also commenced network deployment or expansion programmes such as CityFibre's joint venture with Sky and TalkTalk, the deployment of FTTP networks to more than 50 rural communities by Gigaclear and Hyperoptic's deployment of FTTP to apartment blocks.

1.9 If this is to continue in the future, Ofcom must nurture and incentivise investment. The imposition of a DFA remedy would, in our view, have the opposite effect. At the very least, we consider that Ofcom should de-couple consideration of the DFA remedy from the BCMR and take the opportunity to consider it in a broader context via the Strategic Review of Digital Communications. This would allow Ofcom more fully to assess how best to achieve its stated investment objectives and, ultimately, to deliver long term, sustainable benefits to end users and consumers.

Introduction

1.10 Virgin Media welcomes the opportunity to comment on this stage of Ofcom's review of the Business Connectivity Markets. As Ofcom notes, the market is worth c.£2bn per year, and the increasing consumption of bandwidth only emphasises its importance.

1.11 Ofcom's proposals represent a significant change in the way that this market is regulated and, consequently, how its participants will act in the future. In our view, these changes will not be for the better. We believe that Ofcom has 'got it wrong' in relation to the main item for this review: its proposal to mandate a Dark Fibre Access (DFA) remedy.

1.12 Ofcom states that it wants to create a regulatory framework that, whilst addressing identified competition concerns arising from a provider's SMP, promotes competition at the deepest level and preserves incentives for investment. We support this objective.

1.13 However, the proposals in the consultation will undermine existing and growing competition for high bandwidth leased lines and, as a consequence, damage Virgin Media's incentive to expand its network. Such an outcome would not accord with Ofcom's duties under the Communications Act 2003 (the Act).

1.14 There is considerable strength of feeling on this issue, and Virgin Media responds to this consultation as both an individual stakeholder and as part of the Infrastructure Investors Group (IIG). This industry group has been formed to respond to the far-reaching proposals to impose passive access remedies. Virgin Media supports the separate response submitted by the IIG which focuses on both the inappropriateness of Ofcom's approach and its potential impact on the industry.

1.15 We have chosen to focus on three areas in this response that are central to Ofcom's support for a passive access remedy. Specifically: Ofcom's market analysis and the CISBO market definition; Ofcom's consideration of dark fibre as a necessary and appropriate remedy; and Ofcom's proposals on the form that DFA should take. In addition, we have provided a response to the specific consultation questions posed by Ofcom where we have a substantive comment to make.

Market Definition

1.16 Ofcom proposes three geographic markets (excluding Hull); the Central London Area (CLA), the London Periphery (LP) and the Rest of UK (RoUK) areas. This approach differs from the current geographic split of the West, East and Central London Area (WECLA) and the RoUK by essentially subdividing the London area into a central and periphery area.

1.17 Ofcom has also varied the product markets, proposing a single market for non-TI products: the CISBO market. Again, this differs from the current differentiation between the AI and MI markets, which identifies a split between Ethernet products up to and including 1Gbit/s (AI) and higher bandwidth Ethernet and WDM products (MI).

Geographic Markets

1.18 As the IIG identifies, the approach adopted by Ofcom in defining these new geographic markets differs significantly from that taken in previous reviews. In particular, Ofcom has set an artificially high bar to determine whether there is competition within an area, with five OCPs[4] required for a competitive market. This contrasts with the test of two OCPs within 200m used to determine the state of competition within WECLA in the 2013 BCMR review, which, as IIG notes, is consistent with both academic assessment of competitive markets and also guidance from the European Commission.

1.19 This approach leads Ofcom to propose that BT holds SMP in areas which are currently held to be competitive (e.g., the LP area in relation to "MI" services), despite a clear *increase* in competition since the 2013 BCMR review. We set out in Annex 1 publically available network maps of OCPs, demonstrating the extent of existing competing infrastructure in London, and discuss this further in our response to Question 9 below.

1.20 Ofcom's approach leads to a situation where the CLA is comprised of three separate areas with gaps (e.g., Hyde Park). This creates a bizarre 'market' which can be arbitraged by using these regulated islands as 'hops' in paths that would otherwise fall within the competitive CLA. We discuss this further in our response to Question 4 below.

Product Markets

1.21 Ofcom's proposal to find a single product market (excluding legacy TI technology), is predicated on removing the 1Gbit/s bandwidth break found in the 2013 review.

[4] OCP – Other Communication Provider than BT

1.22 The analysis presented in the consultation considers the relative cost differentials between products and the competitive conditions associated with the various bandwidths. However, the approach undertaken in this review appears to ignore the comprehensive assessment undertaken in 2013 when a bandwidth break was found.

1.23 We discuss the differences in approach between the reviews in response to Question 4 below, but consider that Ofcom's assessment in this consultation is both flawed and incomplete. In particular, in the examination of competitive conditions, the service share analysis suggests a significant distinction between AI and MI services. In attempting to explain this away Ofcom says that the constraint of Virgin Media (as only *"one major rival"*) is insufficient to provide an effective constraint on BT. However, in CBDs, BT only has a 21% share of high bandwidth circuits, not only less than Virgin Media, but also less that the aggregate share of other CPs (excluding Virgin Media) in that market.[5] These relative market shares, even if approximate, do not allow the conclusion that BT only faces competition from one rival operator.

1.24 Ofcom also relies upon a consumer survey conclude that there is no bandwidth split. However, the evidence as presented can more readily be interpreted as supporting the continuation of a bandwidth break.

Overall Effect

1.25 The proposed approach creates a near national market across the UK (excluding Hull), which allows for the imposition of a dark fibre remedy that is not constrained by either geography or product.

1.26 However, the market definitions have not been substantiated by the analysis in the consultation. There remain significant gaps in Ofcom's work which mean that it has failed to explain its change in approach from 2013, and has not properly considered the facts: the market changes in fact show an increase in competition since that review).

Dark Fibre: Principled objection

1.27 Aside from the proposal to alter the boundaries of the market, the most significant change proposed by Ofcom is the requirement on BT to provide DFA. DFA is required to address BT's SMP in the CISBO market.

1.28 In order to impose a remedy, Ofcom has to identify the competition concern. Here Ofcom analysis is deficient. The sole justification for the imposition of DFA appears to be that it brings more benefits to purchasers than active access remedies on their own.

[5] 2015 BCMR: Table 4.5

1.29 However, alleged benefits of DFA *do not* match a competition concern. Even if we accepted the premise that DFA brought additional benefits (which we do not) this is not, in and of itself, sufficient justification for its use as an SMP remedy.

1.30 Ofcom sets out the purpose of its proposed DFA remedy to "[facilitate] *competition in downstream markets by enabling CPs to compete without the need to invest in a network*."[6]

1.31 Any remedy imposed has, under section 47 of the 2003 Act, to be proportionate in relation to what it is intended to achieve. Virgin Media considers that Ofcom's objective can be achieved by the imposition of a more proportionate active remedy. Indeed, it would appear that Ofcom agrees with the first part of this assessment, as the stated purpose of its proposed active access remedy is identically worded.[7] If the facilitation of competition can be achieved through the less intrusive and disruptive application of active remedies, it cannot be correct that the imposition of DFA can meet the statutory test set out in section 47 requiring, *inter alia*, that remedies be proportionate. In addition, Virgin Media considers that Ofcom's approach to the relevant statutory provisions has not been adequately considered and reasoned. The consultation simply states that the tests have been met without citing the relevant justifications; this is insufficient to satisfy its legal obligations.

1.32 As noted above, Virgin Media considers that Ofcom has overstated the benefits that would be derived by the imposition of DFA. Virgin Media endorses Ofcom's view from the 2013 statement that the benefit of passive remedies "*could to a large extent be achieved by*"[8] active remedies.

1.33 Innovation was cited as a key area of benefit from DFA in the preliminary consultation on passive remedies.[9] This, again, was a matter considered by Ofcom in the 2013 review, when the imposition of passive remedies was rejected on the basis that the associated benefits would not outweigh the risks of such a change in the basis of regulation from active to passive remedies.

[6] 2015 BCMR, paragraph 9.51
[7] 2015 BCMR, paragraph 10.75
[8] 2015 BCMR, paragraph 8.43
[9] 2015 BCMR, paragraph 1.14

1.34 Innovation has been further examined in this consultation, with Annex 27 devoted to an assessment of how DFA can realise innovation benefits. However, the Annex contains very little evidence of specific innovations. Ofcom fails to point to a single major technology or application that would emerge as a consequence of passive remedies. This is particularly significant given the use of examples in the preliminary consultation, such as C-RAN, which Ofcom suggested would be a particular use for dark fibre. As Virgin Media noted at the time, dark fibre is not a prerequisite for C-RAN, nor is it necessarily the most suitable form of connectivity given its shortcomings in fault detection and continuity of service.[10] Ofcom has not addressed this comment and the absence of discussion on C-RAN in Annex 27 is significant. Although Ofcom still seems to suggest that C-RAN may benefit from dark fibre in a single passing footnote reference,[11] there is no explanation presented in the Annex.

1.35 Ofcom has recognises that the Regulatory Framework requires that the imposition of any remedy must be justified on the basis of clear evidence.[12] Ofcom provides no such strong evidence base in this case, nor any sufficient explanation of what has changed in the market since 2013.

1.36 Ofcom recognises the risks of imposition of passive access include:

- the clear and material risk to existing alternative network infrastructure investment;
- the regulatory instability that remedies such as DFA introduce; and
- the likelihood that alternative operators will be wary of making future investments in a regulatory environment which alters the economics of the markets in which they are considering investing.

1.37 Ofcom downplays these concerns by claiming that they can be mitigated by appropriately structuring any remedy. This misses the point. The introduction of DFA would be a radical intervention which would still send a negative message to investors. This was recognised in 2013 when Ofcom concluded that any future introduction of passive remedies would have to be clearly evidence based, and given the risk to infrastructure investment, it should be wary of making such changes.

1.38 Additionally, the ‘mitigation’ proposed by Ofcom is insufficient to mitigate the risks identified. How can the decimation of the high bandwidth market give investors in infrastructure confidence that they will make a return on their existing investments and encourage them to build further? We discuss Ofcom’s proposals for the DFA remedy below.

[10] Pages 12-13
[11] Footnote 200
[12] In accordance with Ofcom’s published Statutory Duties and Regulatory Principles, http://www.ofcom.org.uk/about/what-is-ofcom/statutory-duties-and-regulatory-principles/

Dark Fibre: Pricing objection

1.39 Ofcom considers how to structure DFA pricing in Annex 26. Ofcom creates a short list of 'possible' approaches: cost based; active basket; and single active reference product, before deciding on the reference product approach.

1.40 Ofcom believes that the risks identified in imposing a passive remedy are best allayed by pricing based on EAD 1Gbit/s less the LRIC of the 'active' elements.

1.41 This prices DFA under 1Gbit/s active connections and significantly below the higher bandwidth and optical solutions that have been the main uses for dark fibre to date. [✂].

1.42 Ofcom suggests on the one hand that this approach to pricing will "*preserve more value in the high value part of the leased line market*",[13] yet on the other it acknowledges that use of a 1Gbit/s reference product will cannibalise the higher bandwidth active market, with *no* new active connections assumed from the second year of the control.[14] Ofcom compares the short list of approaches and concludes that using the reference product approach will preserve more value than the other considered options. This conclusion is flawed. There are other, far more appropriate, approaches than the use of an EAD 1Gbit/s reference product that have not been considered (discussed below).

1.43 This passive remedy will also undermine the existing commercial dark fibre market because the regulated price of dark fibre is significantly below the current market price. The CLA dark fibre market could also be affected because, although it is unregulated, should BT offer national pricing for dark fibre (as it has done for active services within the WECLA) this would leave current OCP pricing as uncompetitive. OCPs would be required to reduce prices to stay competitive; we can expect this to lessen the incentive to invest further in CLA networks.

1.44 The IIG has undertaken an impact assessment, notably lacking in Ofcom's consultation, which explores the extent to which the proposed approach may affect the CLA and the broader UK markets. The aggregate estimated impact on all IIG members in the two-year period after DFA is introduced is a £[✂] reduction in revenue, [✂].

1.45 The materiality of this impact means that Ofcom should consider further analysis. The fact that the estimates also indicate the result of the remedy could be a substantial gain in market share for BT in the CLA supports our assertion that one of the results of DFA will be to undo the increases in competition that have been achieved since the previous BCMR review.

1.46 Aside from the impact of DFA on providers of alternative infrastructure, we consider that Ofcom has not undertaken a full assessment of the pricing of DFA. In particular:

[13] 2015 BCMR, paragraph A26.127
[14] 2105 LLCC, paragraph 6.16

- there is no consideration of the commercial pricing of dark fibre in the UK, including the competitive CLA market (as prospectively defined);
- there is a only a partial examination of a 'fair and reasonable' requirement for pricing;
- there is inadequate consideration of appropriate reference products above 1Gbit/s; and
- there are a number of important and interrelated policy reviews being undertaken simultaneously, including Ofcom's own Digital Communications Review (DCR) and DCMS's implementation of the Civil Infrastructure Directive (CID). Ofcom has failed to consider the potential impact of these reviews on the appropriateness of a passive access remedy; and
- there is no consideration of how passive access is regulated by other NRAs.

The Commercial Pricing Factor

1.47 Ofcom has not assessed or considered the current state of the dark fibre market. The London area has a number of competing operators offering dark fibre (see Annex 1 for examples) and the market has grown considerably since the 2013 BCMR. Under section 88(4)(a) of the Communications Act 2003 (the Act), Ofcom is required to have regard to the prices at which services are available in comparable competitive markets[15] in order to determine whether any pricing regulation is appropriate in the circumstances.

1.48 The number of competitors and BT's lower market share compared with other geographic areas, provides evidence that the market is competitive and therefore that the prices charged are at or around the competitive level. The latter should be viewed as a reasonable proxy for the efficient cost (including a return on investment) of the provision of dark fibre. Given Ofcom's intent in seeking to regulate in a manner that replicates the effects of a competitive market, this pricing benchmark is an important factor that Ofcom has failed to take into account.

Fair and Reasonable

1.49 Ofcom dismisses the potential to regulate pricing on a 'fair and reasonable' basis by saying that such a condition would lack any regulatory certainty; that this uncertainty would lead to disputes and that a more specific pricing approach would therefore be appropriate.

1.50 This fails to acknowledge the role of a 'fair and reasonable' remedy as a light touch approach with a backstop ability to regulate on an ex ante basis should problems arise.

[15] Section 88(4)(a) Communications Act 2003

1.51 Fair and reasonable is defined in the 2002 Access Guidelines as requiring "*amongst other things, that terms and conditions under which products are offered are consistent with those which would be offered in a competitive market, sensible, practical, and do not impose a margin squeeze on competitors*"[16]. Similar conditions appear to work well in other countries where the pricing of dark fibre is simply required to be agreed on a commercial basis. Furthermore, as we have a competitive benchmark market in London, there is already good guidance as to what a commercial price would be, minimising the risk of disputes or enabling their early resolution.

1.52 Fair and reasonable pricing was required of BT at the outcome of 2010 WLA market review. VULA and Dark Fibre have very similar characteristics, in that both are a new product designed to give passive (in the case of VULA, virtual passive) access to BT's network. At the time of implementation of VULA, demand and take-up was unclear (as is the case for DFA), and there was a need to ensure that investment incentives were not skewed. Indeed, in the 2014 FAMR, Ofcom noted the success of the fair and reasonable approach in maintaining investment incentives given the expenditure made by both BT and Virgin Media in continuing to upgrade their networks for the provision of higher speed broadband.[17]

1.53 This approach also accords with the European Commission recommendation in relation to VULA style remedies that provides NRAs with greater discretion over appropriate pricing methodologies for products where there is significant demand uncertainty. The Commission states that:

[16] 2002 Access Guidelines, paragraph 3.39

[17] 2015 FAMR – Approach to the VULA Margin, paragraph 3.120

> *"Due to current demand uncertainty regarding the provision of very-high speed broadband services it is important in order to promote efficient investment and innovation, in accordance with Article 8(5)(d) of Directive 2002/21/EC, to allow those operators investing in NGA networks a certain degree of pricing flexibility to test price points and conduct appropriate penetration pricing. This would allow SMP operators and access seekers to share some of the investment risk by differentiating wholesale access prices according to the access seekers' level of commitment. This could result in lower prices for long-term agreements with volume guarantees, which could reflect access seekers taking on some of the risks associated with uncertain demand. In addition, pricing flexibility at wholesale level is necessary to allow both the access seeker and the SMP operator's retail business to introduce price differentiation on the retail broadband market in order to better address consumer preferences and foster penetration of very high-speed broadband services. In line with points 48-57, to prevent such pricing flexibility leading to excessive prices in markets where SMP has been found, it should be accompanied by additional safeguards to protect competition. To this end, the stricter non-discrimination obligation, i.e. EoI and technical replicability, should be complemented by guaranteed economic replicability of downstream products in conjunction with price regulation of copper wholesale access products"[18].*

1.54 Whilst this recommendation applies to broadband access, it could equally apply to DFA in the context of the BCMR. The approach taken in regulating VULA allowed for a light touch approach following the 2010 WLA market review in which the remedy was introduced, and then a more detailed consideration of the remedy in the second round 2014 FAMR review when uptake and future demand was more certain. This allowed Ofcom to implement an additional control in the form of the VULA Margin Condition.

Appropriate Reference Products over 1Gbit/s

1.55 Ofcom also dismisses the use of 10Gbit/s EAD services as a reference product. Virgin Media submits that the impact assessment conducted by IIG clearly shows the high risks associated with using 1Gbit/s EAD as the reference product; this alone should prompt a more thorough consideration of alternative higher bandwidth products as a reference.

1.56 Ofcom's rationale for not fully considering 10Gbit/s EAD is that it is a new product and its pricing is uncertain. In rejecting 10Gbit/s EAD, Ofcom has failed to adopt the forward look approach required under the market review process. Although 10Gbit/s EAD is a new product, it will not be new at the commencement of this market review control period (1 April 2016), and it will have been available to customers for a considerable time by 1 April 2017 when Ofcom is proposing that DFA should be made available.

[18] Paras 49 to 50 of Commission recommendation on consistent non-discrimination obligations and costing methodologies to promote competition and enhance the broadband investment environment - C(2013) 5761

1.57 As Virgin Media sets out above, the potential usage for Dark Fibre is likely to be in relation to higher bandwidth solutions, and indeed Ofcom expects *all* active connections above 1Gbit/s to be cannibalised due to the introduction of DFA. If the predominant commercial use of dark fibre is as an alternative to high bandwidth active circuits, this supports the use of a high bandwidth reference product.

1.58 The acknowledged need (from the 2013 review) for Ofcom to be 'wary' in its approach to regulation of Dark Fibre also supports taking a less aggressive approach to pricing. The risk of the damaging consequences associated with 'getting it wrong' are substantially greater if Ofcom over-regulates, by imposing more stringent price controls, as opposed to under-regulating with a more light touch approach to pricing in the context of DFA. To over-regulate pricing at this stage would, as is clear from this response, and the response submitted by IIG, have significant adverse effects on the market.

1.59 To take a lighter touch approach to regulation would substantially lessen any risk and have the advantage of allowing Ofcom to assess the effect of the remedy ahead of the next market review.

1.60 A full consideration of less intrusive remedies, such as a 10Gbit/s reference product, is essential. Were a 10Gbit/s reference product to be adopted, it is unlikely that CPs would be deterred from purchasing the dark fibre input if their intent is to develop innovative services. Furthermore, this approach would also accord with the sentiment of the EC recommendation set out above. In addition, a 10Gbit/s reference would likely reduce the potential for arbitrage-motivated take-up of DFA from lower bandwidth services. As we discuss later in this response, a large proportion of the negative impact of the DFA remedy on Virgin Media stems from the impact on 1Gbit/s volumes.

1.61 In any event, Virgin Media disagrees with Ofcom's assessment that there is too much uncertainty surrounding the current proposed pricing of 10Gbit/s EAD. As Figure 4.1 shows the BT's proposed pricing has been set with reference to other products available, in particular, the OSA products offered by BT. Ofcom notes that 10Gbit/s EAD will be a likely constraint on the price of OSA products (and vice versa), so although the introduction of a new product does involve the setting of a new price, BT has set its provisional 10Gbit/s EAD pricing with reference to the comparable OSA product. This is likely to be the case in the future.

1.62 Ofcom suggests that the remedy could be 'gamed' if 10Gbit/s EAD was selected as a reference product. Given the proposed safeguard cap on high bandwidth services, and the ability of a fair and reasonable pricing requirement to frustrate BT from raising the reference price in advance of the introduction of a DFA product, this is a concern without foundation.

De-coupling Passive Remedies from BCMR

1.63 Virgin Media considers that given the flawed analysis underpinning DFA; the lack of a thorough consideration of other viable options and the obvious and significant risks involved, there is an obvious course that should be taken by Ofcom. Any DFA remedy should be considered separately from the main market review. There are a number of sound reasons why this approach is preferable to any attempt to rush through regulation based upon a desire to keep the main market review and its associated charge controls on track for 1 April 2016 implementation, and therefore within the three year review period stipulated by section 84 of the Act; in particular:

- the lack of full and appropriate consideration of the issue in this consultation;
- the benefit in being able to take account of the DCR strategic review;
- the benefit of being able to consider fully other infrastructure regulation in the form of UK transposition of the Civil Infrastructure Directive; and
- the ability to link the topic of dark fibre to both the BCMR and the DCR

Lack of full and appropriate consideration

1.64 Virgin Media has set out above the basis upon which it considers that the consultation is flawed and insufficient. Taking these comments, alongside those of the IIG and other infrastructure owning CPs like BT and KCOM, Ofcom has, at a minimum, an obligation to consider fully and address the concerns raised.

1.65 Virgin Media considers that a further consultation will be required in order to consider these issues properly. Therefore, it would be appropriate to decouple the contentious and self-contained issue of DFA, leaving the main review to complete on time, prior to the expiry of the current LLCC.

Digital Communications Review (DCR)

1.66 Ofcom published its initial DCR consultation on 16 July. It seeks stakeholder views in October, with a view to a further statement on priorities and action around the turn of the year.

1.67 A key theme in the DCR is the need to preserve and promote investment incentives. The need for the regulatory environment to provide "*the right incentives for private sector investment and innovation*" is listed as the first of four strategic challenges facing Ofcom. Ofcom also notes the benefits that end-to-end competition can have on stimulating innovation and investment and states an intention to have a greater reliance on end-to-end competition to pursue its objectives. Further, Ofcom notes the need to protect incentives for "*new, significant and potentially risky investment*" (e.g., Virgin Media's Project Lightning).

1.68 It seems perverse to introduce an intrusive passive remedy, which Ofcom acknowledges will harm incentives to invest, ahead of a strategic review design to encourage competing private sector infrastructure investment. At the very least, Ofcom should use the DCR to decide on a balance between passive and active remedies in context of a strategic framework for the sector ahead of any introduction of the former.

1.69 If the issue of passive access were decoupled from the substantive BCMR, this would allow Ofcom to ensure that its approach to market-specific regulation is fully aligned with its longer-term strategic objectives.

Civil Infrastructure Directive (CID)

1.70 Ofcom refers to the Civil Infrastructure Directive in the consultation. Currently, DCMS is in the process of considering how to implement the CID into UK law; this process remains is ongoing.

1.71 Ofcom claims to take this into account in the BCMR.[19] However, Ofcom's analysis is cursory. It dismisses the relevance of the CID because its effects are likely to be uncertain.

> *"At this stage, we consider that there is significant uncertainty about the practical effects of the future legislation implementing the CID. In particular, we note that it will not come into effect until after we conclude the 2016 BCMR, and consider that it may take some time after its implementation to resolve issues about, in particular, the scope and pricing of access. Only once these issues have been resolved will we be able to ascertain with a degree of certainty whether the CID provides a viable alternative access solution for telecoms infrastructure."*[20]

1.72 This recognises the overlap between the CID and any regulations mandating passive access imposed in the BCMR, yet the uncertainty is used only to justify a need to regulate in the near term, rather than considering the more appropriate option of ensuring that a relevant factor can be fully taken account of in considering what, if any, proposals are appropriate for the UK market.

Regulation by other NRAs

1.73 Whilst Ofcom has to take account of specific national characteristics of UK markets, it is often instructive to look at approaches taken by other regulators. Although there is little consistency on how dark fibre pricing is regulated, some NRAs have adopted a 'light touch' approach. Indeed, pricing is left to commercial negotiation in both France and Portugal.[21]

1.74 Given the accepted need to be cautious when introducing such a novel and intrusive remedy, especially given the risk to investment incentives, a consideration of such alternative approaches should at the very least feature in the analysis.

How Ofcom could remedy these concerns

1.75 Virgin Media considers that, in the event that Ofcom wishes to consider the imposition of DFA, it should do so having decoupled the issue from the main consultation.

[19] 2015 BCMR, paragraph 2.46-2.48
[20] 2015 BCMR, paragraph A13.12
[21] See Annex 2 for a comparison of NRA approaches to Dark Fibre regulation

1.76 Such an approach is not without precedent. Ofcom concluded the Narrowband 2010 review prior to its conclusion on how to regulate the Single Tandem market (when the initial proposal to deregulate the market was reversed). More recently, in Ofcom's review of the Fixed Access Markets, Ofcom initially proposed to regulate the VULA margin. Recognising that the issue was more complex than contemplated in its original proposal, Ofcom rightly chose to decouple this issue from the main FAMR and undertook separate and far more comprehensive consultation on how best to ensure that the margin was appropriately regulated.

1.77 A similar approach would allow Ofcom to conclude a substantive part of the review within good time for the imposition of new active charge controls in April 2016, whilst ensuring that any implementation of a passive remedy (which Ofcom recognises will take time to implement in any event), is fully considered and consulted upon.

1.78 Ofcom has informally suggested[22] that, on this occasion, decoupling the issue of passive access from the substantive review may be more difficult as the setting of active charge controls needs to be undertaken alongside the imposition of a passive remedy, as both remedies will affect BTs ability to recover its common costs.

1.79 Virgin Media does not consider that this is a valid argument. Ofcom lists three factors in the proposed dark fibre remedy that influence the charge control:

- Development costs: Ofcom adds £5-£10m to each year of the cost stack to take account of fibre development costs;[23]
- Circuit volumes: volumes are based on an assumed cannibalisation of 50-100% of new connections at 1Gbit/s and above being provided using DFA.[24] This decrease in circuit volumes will have an impact on Ofcom's total cost estimates.
- Common cost recovery: Ofcom has noted that there will be a shortfall in common cost recovery from WES and Optical services because of the difference in price between dark fibre and high bandwidth circuits. Ofcom adds £4.6m of costs to the 2018/19 cost stack to take account of a shortfall in common cost recovery[25].

1.80 Virgin Media suggests that the impact of these factors is small and should not be a material consideration in a decision to decouple this aspect of the review from the main BCMR.

1.81 Should Ofcom choose, it could seek to reduce the negative impact of the imposition of a dark fibre remedy by building in an appropriate allowance into the charge control.

1.82 DFA development costs could still be added to the cost stack without knowing the detailed design of the remedy, based on a view that the current proposal is to mandate DFA in some form. The actual quantum of the development costs are unlikely to vary significantly depending on the form of the remedy.

[22] Virgin Media / Ofcom meeting, 04/06/2015
[23] 2015 LLCC, paragraph A6.11
[24] 2015 LLCC, paragraph 6.83
[25] 2015 LLCC, paragraph A6.132

1.83 The assumption on cannibalised circuit volumes relates to higher than 1Gbit/s circuits and as such only 1%[26] of total volumes. Although the cannibalised volume could change if Ofcom designed the remedy in a different way (reducing if a higher bandwidth reference product was selected) the overall effect on the control is limited given the small number of circuits potentially affected. Therefore, it would be appropriate for Ofcom not to include a cost uplift or make a conservative assumption in relation to cannibalisation.

1.84 This still leaves the issue of a shortfall in common cost recovery. This would occur on services that are not charge controlled (i.e., the over 1Gbit/s services). The extent to which there is a shortfall in common cost recovery does depend on the pricing of dark fibre. The higher the price of dark fibre price, the smaller the shortfall.

1.85 However, as Ofcom notes, the volume of the high bandwidth circuits compared to the volume of circuits up to and including 1Gbit/s is small. Therefore, under Ofcom's proposed reference product pricing, the overall number of circuits that would be cannibalised would be small, and therefore Virgin Media believes that it should not be a material consideration in setting any active control.

1.86 Ofcom could therefore take a variety of approaches, either not including any additional recovery or making a conservative assumption regarding DFA pricing (i.e., that it was using a higher bandwidth reference product) which would have the effect of slightly reducing the 2018/19 cost stack.

1.87 Although the latter approach would require a judgement on the part of Ofcom and could leave BT worse off, for example if the charge control is set on the basis of a higher dark fibre price than actually occurs, even in this case the shortfall adjustment is notably small.

1.88 We believe that Ofcom could robustly take account of any uncertainty in relation to the existence of or the nature of any dark fibre remedy, and make the necessary minor adjustment to charge control proposals, in order to decouple the conclusion of the dark fibre remedy. Although it may be argued that this could lead to some inconsistency between the charge control and the dark fibre remedy, the alternative approach is to rush through a flawed dark fibre remedy (which may clash with the conclusions from the DCR) because of the need to set the charge control on time. In any case, any inconsistency would be de minimis in magnitude and cannot be expected to adversely affect competition or customers.

1.89 De-coupling the issue of passive remedies from the main consultation would allow a fully considered consultation by Ofcom on how the remedy could best preserve investment incentives. Virgin Media is particularly concerned that, should Ofcom impose the dark fibre remedy as currently proposed, the use of the 1Gbit/s EAD benchmark would seriously undermine the incentive to invest in end-to-end network infrastructure which Ofcom's (and the UK Government's) wider policy seeks to promote.

Conclusion

[26] 2015 BCMR, paragraph A15.86

1.90 Virgin Media considers that Ofcom has erred in its proposals for the imposition of mandated DFA. We have serious doubts in relation to the proposed market definitions, both in respect of their bandwidth and geography.

1.91 Aside from our concerns in relation to market definition, Ofcom has failed to address relevant issues in its consideration of whether to impose a passive remedy. Most notably, it has not: identified a relevant competition concern that requires a the imposition of DFA; undertaken a thorough consideration of the range of possible pricing options for DFA; and failed to assess the impact that these options have on the wider business connectivity market.

1.92 The proposals outlined could, and in Virgin Media's view would, have a substantive and long-term negative effect on the UK communications industry. This is at odds with Ofcom's stated strategic intent in the DCR.

1.93 Virgin Media considers that all of these issues need to be addressed fully so that the review can come to a proper and fully reasoned conclusion. The best way to undertake this would be to decouple the consideration of dark fibre from the main review.

Ofcom Questions

Section 4: Market Assessment (Current Wholesale Products - CISBO)

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

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

Ofcom has proposed a single market for current technology products, the CISBO. This is a significant departure from the approach taken in 2013 when Ofcom concluded that there were distinct wholesale (and retail) markets for (AI) products up to and including 1Gbit/s and (MI) products over 1Gbit/s and WDM products.

Virgin Media considers that the approach taken in 2013, which identified a bandwidth break in the chain of substitution was correct at the time, and continues to be appropriate given today's market circumstances. Although there has been a movement of demand up the bandwidth scale towards 1Gbit/s products (driven in part by BT's pricing strategy in relation to its 10Mbit/s and 100Mbit/s wholesale products), as we show below, the divide between 1Gbit/s and higher bandwidth solutions remains. We therefore disagree with the proposed market definition and consider that, based on the available evidence, a similar approach to that taken in 2013 is appropriate.

Ofcom's Methodology

Ofcom believes that its change of approach in relation to defining contemporary connectivity markets is evidence driven. It is worth noting that in 2013 Ofcom concluded that the important factor to consider when determining whether or not the AI and TI services could be combined into a single product market was the homogeneity, or otherwise, of competitive conditions in the two markets.

Ofcom considered, that despite some factors pointing to the markets being combined (such as the evolution of Ethernet functionality eroding differences between the protocols), separate markets should be maintained because *"the differences in competitive conditions for AI and TI services tended to support our proposal to define separate product markets."*[27]

Ofcom relied upon, for example, BT's strong nationwide market share in TI services, compared with AI services which exhibit geographic variation in competitive conditions. This was considered to be a strong factor in determining that the markets should be separate.

[27] 2013 BCMR, paragraph 4.76

Virgin Media agreed with this previous analysis and would expect the same factors to be considered (with the same weight attached) in defining contemporary markets in this review. Virgin Media does not believe the analysis presented in this review provides an adequate evidence base to introduce the remedies that Ofcom has proposed.

Ofcom's key factors

Ofcom identifies two key factors to support its revised approach to market definition:

- relative cost and pricing differentials between products; and
- the competitive conditions associated with the relevant product sets.

It is asserted that these support the claim that a chain of substitution applies between 1Gbit/s and higher bandwidth products.

Costs and Pricing: BT EAD Pricing

In relation to the cost differential, Ofcom cites the reduction in BT's pricing for high bandwidth products and lower equipment costs for single Ethernet services as supporting its approach.

In the 2013 BCMR Ofcom undertook a comprehensive analysis of the difference between provision of 1Gbit/s Ethernet and higher bandwidth solutions (which it found to be in different economic markets). Equipment costs were found to be seven times higher for WES 2.5Gbit/s circuits. Ofcom acknowledged that the actual differential (between comparable products of different bandwidths) was likely to be lower given that WES was legacy technology (and therefore more expensive than its successor, EAD), but even so, it was noted that the differential was mainly caused by falling costs of equipment for 1Gbit/s and below.[28]

In addition, it was noted that the hardware used differs for services up to 1Gbit/s and services above 1Gbit/s. Specifically, higher bandwidth circuits required dedicated NTE; higher levels of planning and design; higher install costs; additional testing (e.g., PMD); and enhanced SLAs to support.[29]

All of the above led Ofcom to conclude that a SSNIP would not be likely to prompt a switch from a 1Gbit/s product to a higher bandwidth product, thus supporting the existence of a clear bandwidth break and separate economic markets.

The 2015 Consultation proposes that no such break between bandwidths now exists. Ofcom says that the pricing differential between 1Gbit/s and higher bandwidths is now less pronounced, especially taking account of the indicative EAD 10Gbit/s pricing published by Openreach. Ofcom suggests that as EAD 10Gbit/s is priced significantly below the equivalent WES product and therefore there is "*no clear break*" in the chain of substitution.

[28] 2013 BCMR, paragraph 3.282

[29] 2013 BCMR, paragraphs 3.283 – 3.286

This analysis relies on the differential between WES 10Gbit/s pricing and EAD 10Gbit/s pricing as a reason to find a break. The two circuit types are not comparable. From a technical point of view, WES uses dual fibre as opposed to single fibre. Additionally, WES is priced as a legacy service to encourage migration to modern alternatives (e.g. OSA/EAD.

Therefore, WES pricing cannot be used as a benchmark for high bandwidth pricing. This lack of comparability of very high bandwidth WES pricing (to EAD) was explicitly acknowledged in the 2013 review, but is disregarded in this review. Ofcom should not observe that 10Gbit/s EAD is cheaper than 10Gbit/s WES and infer that the price of 10Gbit/s services in general have been reduced and that therefore there is no longer a bandwidth break. It is not appropriate for Ofcom to rely on the pricing differential between WES 10Gbit/s and EAD 10Gbit/s to support an argument that the cost differential has narrowed to the extent that there is "*no clear break*" between 1Gbit/s and higher bandwidth circuits.

In Figure 4.1 Ofcom compares relative pricing and shows 1Gbit/s EAD with an annualised price of less than £10k, and roughly double that for 10Gbit/s EAD. A SNNIP test on 1Gbit/s EAD should *not* conclude that users would switch to 10Gbit/s if their technical service requirements are currently met by a 1Gbit/s service. Consequently, the bandwidth break is still appropriate. Ofcom acknowledges this pricing gap,[30] but suggests that this needs to be considered alongside costs and OCP pricing. This issues are discussed in turn below.

Costs and Pricing: Costs

Ofcom also takes a significantly different approach to costs compared with that taken in 2013.

Ofcom does not explicitly update its 2013 analysis of the differences in hardware costs between services up to 1Gbit/s and services over 1Gbit/s. Even if costs differentials have reduced with the introduction of 10Gbit/s EAD, there remain significant differences between other "AI" and "MI" products. In particular, Ofcom notes the difference of CP interconnection costs for BT's Ethernet products and BT's WDM products in Section 10 of the consultation.

Section 10 discusses and proposes active remedies in the CI market. Ofcom notes that it found in its last review that there were significant barriers to interconnect with BT's WDM services, and as a result, although CPs were able to interconnect with Ethernet to build end-to-end retail services, they did not do so with WDM services because interconnection was more costly and there were issues relating to reliability.[31] Ofcom has now re-assessed the extent to which these issues still remain in the context of imposing interconnection remedies. Ofcom states that, although BT has recently introduced more products to facilitate interconnection (such as OTU options, and a "*friendly alien wavelength*" interface option), *"it remains unclear how well they will facilitate CPs' ability to interconnect WDM services"*[32].

[30] 2015 BCMR, paragraph 4.54
[31] 2015 BCMR, paragraph 10.11
[32] 2015 BCMR, paragraph 10.15

This suggests the difference between the cost of Ethernet and WDM remains; that a 1Gbit/s Ethernet circuit and a WDM circuit are not substitutes and that the two are in separate markets. Again, despite the reliance on these differences in Section 10 of the consultation, this matter appears not to have been considered at all in the context of market definition.

In making its proposal for a single CISBO market, Ofcom, in Table 4.2, compares only the direct costs of equipment and does not take account of the other relevant features cited in 2013 (NTE, planning and design, installation and testing). Ofcom says that such differences *"are not likely to be a function of technology or bandwidth choice, but rather are driven by the underlying connectivity needs of a particular customer".* Instead, Ofcom now focuses on other costs such as duct and fibre that, as common elements, do not vary between bandwidth.

Therefore, despite Ofcom still acknowledging that the costs of Ethernet and WDM equipment "*remain more significant*",[33] Ofcom now proposes that the overall costs differential is not significant without any explanation as to why it has changed its approach or why issues considered relevant in 2013 are now not considered germane. Equally, the shift in emphasis to common elements (which align costs between products sitting on those shared elements), is not clearly explained.

This change of approach gives insufficient weight to the cost differences that still exist between Ethernet, and WDM provided solutions.

Costs and Pricing: Customer Survey Data

Ofcom also places apparent weight on a consumer survey compiled by Analysys Mason on behalf of BT, relating to customer bandwidth upgrade intentions. Ofcom concludes from the information that this is an indicator that customers appear inclined to migrate from lower to higher bandwidths.

Virgin Media considers that the survey data, as presented, does appear to indicate migration up the bandwidth scale, but *only* in the case of customers with services at lower bandwidths migrating upwards *within* the exiting AI market. The survey data does not show this trend continues across the AI/MI divide.

The survey data show that between 20-30% of customers with up to 100Mbit/s products have expectations of higher bandwidth requirements within both 12 months and 3 years. In contrast, only around 10-12% of customers with over 100Mbit/s connections have this expectation. Further, while around 20% of customers with bandwidth between 100Mbit/s and 1Gbit/s expect bandwidth requirements to grow, only around 12% of >1Gbit/s customers expect imminent growth.

It is not possible to determine from the data what proportion of customers in the >100Mbit/s up to 1Gbit/s category foresee a growth in bandwidth requirements that may lead them to upgrade but still remain within the AI market (e.g. upgrade from 100Mbit/s to

[33] 2015 BCMR, paragraph 4.57

1Gbit/s).[34] However, given the low proportion of >1Gbit/s customers that intend to upgrade, and the pattern of responses of lower bandwidth customers, it is not unreasonable to expect that many customers in the >100Mbit/s to 1Gbit/s category that do plan to upgrade, would stay in that bandwidth grouping.

From the information presented, it therefore appears that relatively few customers that currently purchase ≤1Gbit/s anticipate increasing their bandwidth needs during the forthcoming price control period. This supports the current bandwidth break, rather than providing evidence to suggest that it has been eroded since the last review. If few ≤1Gbit/s customers signal that their intentions are to upgrade to higher bandwidth services during this review period, then the customer base of ≤1Gbit/s, in most cases, does not consider very high bandwidth services as a substitute for their current services. Equally, no very high bandwidth customers are considering reduction in required bandwidth and therefore lower bandwidths are not a substitute for their very high bandwidth services. As customers on either side of this bandwidth break in the market do not consider the next nearest service to be a reasonable alternative, this implies there is a break in customer demand at the 1Gbit/s level.

The data are consistent with the view that there remains a natural breakpoint in at the 1Gbit/s point from the perspective of customers.

Costs and Pricing: OCP Pricing

Ofcom considers OCP pricing, something that was not a focus in its 2013 analysis. Ofcom's provisional assessment is that other operators are offering more flexible solutions to be able to compete with BT and win business. Ofcom characterises this as *"blur[ing] the previous distinctions"*[35] in the use of WDM, and notes that in the case of one, confidential, operator it is *"difficult to see a clear break in the pricing schedule".*

Ofcom presents this evidence of competition for high bandwidth services as a reason for there being no distinct bandwidth break between 1Gbit/s and higher bandwidth circuits. We discuss the competitive nature of the market below, but there has been a significant increase in the competition for higher bandwidth services since the last review when, even then, it was acknowledged by Ofcom that the market was tending towards competition. However, an increase in the level of competition does not necessarily mean that the break in the market has ceased to exist. It would be wrong and counterintuitive to rely on evidence of increased competition to justify an increase in regulation of higher bandwidth services. The fact that some niche operators will undercut BT's high bandwidth solutions is a function of effective competition, resulting in lower prices. The simple existence of a lower priced alternative does not "*fill the gap*" as Ofcom suggests, given that the pricing differential between 1Gbit/s and higher bandwidth solutions remains.

Additionally, the concept of some competition "*in the gaps"* is not a new phenomenon, and was fully taken account of in 2013. As Ofcom notes, Sky raised the overlap between the

[34] If more disaggregated information were available to Ofcom on this survey data, Virgin Media would welcome a clarification on this point as it may provide clear evidence of the persistent break in customer demand at the 1Gbit/s level.

[35] 2015 BCMR, paragraph 4.63

MISBO and AISBO services during the last review. Ofcom did not accept this argument (in terms of influencing the decision on market definition) in 2013, but again appears to have changed its view in this consultation. Ofcom has failed to explain why it has changed its approach from that taken in 2013.

Competitive Landscape

In 2013, Ofcom noted that the MISBO market showed signs of competition, and specifically recognised the need to ensure that the green shoots of competition were not frustrated by regulation. Ofcom particularly recognised the need to promote competition at the "*deepest level at which it is economic*", and that any remedies imposed "*should not diminish CPs' incentives to invest in infrastructure*" .[36.]

Since 2013, competition has continued to grow in the high bandwidth market, which is of key importance to infrastructure investors. Whilst Virgin Media has some reservations about the accuracy of the service share data published both in Ofcom's preliminary consultation and in this consultation, it is clear that there is a competitive market for these services. This is shown not only in the service share data, but also from market characteristics. For example, in a competitive tender, Virgin Media will typically compete against a number of alternative providers, including BT, for the business.[37]

This situation has been facilitated by the approach taken by Ofcom in 2013, which explicitly put the need to encourage infrastructure investment as a key consideration in furthering Business Connectivity within the UK. In 2015, we now have unprecedented levels of investment in infrastructure, with Virgin Media's £3bn investment in Project Lightning an example of this trend. Other providers such as CityFibre continue to develop business on the basis of investment in a variety of city locations, with other global players such as Zayo seeing the UK as a supportive market in which to invest.

Ofcom suggests that there is a lack of effective competition in the high bandwidth market. Essentially, it dismisses Virgin Media's share of the market, on the basis that "*one major rival is unlikely to offer an effective constraint on BT*",[38] whilst rejecting the effect of other competitors entirely. This is despite (on its service share analysis) assessing that for CDBs, in relation to high bandwidth circuits, BT only has a 21% service share, not only less than Virgin Media, but also less that the aggregate share of other CPs (excluding Virgin Media) in that market.[39] These relative market shares, even if approximate[40], do not show that BT only faces competition from one rival operator.

In relation to Ofcom's ROCE analysis, whilst on the one hand Ofcom seeks to rely on high returns to suggest the market is not competitive, it has also found apparent shifts away from BT in terms of service shares. Ofcom concedes that BT's returns may "*provide part of the*

[36] 2013 BCMR, paragraph13.57
[37] As outlined in email from Virgin Media (David Christie) to Ofcom (Kalvin Bahia) 26/01/15
[38] 2015 BCMR, paragraph 4.134
[39] 2015 BCMR, table 4.5
[40] Virgin Media does not accept that the service share analysis is robust, given the limitations accepted by Ofcom in its consideration of the underlying data supplied by CPs.

explanation as to why Virgin Media may have made substantial inroads into BT's sales"[41]). As noted above, it is not only Virgin Media with whom BT competes in the very high bandwidth market, Ofcom has also found that BT has made significant price reductions in high bandwidth services (which it uses to support the contention that there is a chain of substitution between hitherto separate markets). Virgin Media considers that Ofcom has failed to explain how these apparent indicators of competition within a market are consistent with its conclusion that the market is not competitive and we do not consider that Ofcom can cite BT's ROCE on MISBO products as being supportive "*evidence that points to a lack of effective competition*". A better reading of the evidence is that there are two separate markets and that high bandwidth circuits are subject to increasing competitive pressure.

Ofcom accepts that there is increased competition in the very high bandwidth connectivity market, stating that it will *"take this into account when deciding on which remedies are appropriate"*[42]. We discuss below why this has not been achieved.

In conclusion, Virgin Media has significant concerns over Ofcom's approach and analysis of wholesale product market definition. It represents a significant change to that taken in 2013, which has not been adequately explained or justified.

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

Ofcom is proposing to define three geographic markets (excluding Hull): the CLA; the LP and the RoUK. In previous BCMRs, Ofcom found a more competitive London market, firstly defining the CELA in 2009, and then, on review, concluding that this market had expanded as the level of competition had increased, defining the WECLA area in 2013.

The consultation now takes a step back in defining the CLA, which roughly translates to the CELA and then a separate market of the LP, which approximately represents the remaining area of the WECLA.

The proposed definitions of the CLA and LP have been derived by taking account of both the old AISBO market and the more competitive (as found in 2013) MISBO market; however, the result is to increase regulation in an increasingly competitive environment. It is incumbent upon Ofcom to set out clearly, and on a fully reasoned basis, the rationale for this significant (and seemingly counter intuitive) change of tack.

Test for Competition

A key change of approach by Ofcom is the assessment of the level of competition within an area. Ofcom now proposes that the test for fully effective competition is BT plus five OCPs within 100m, or four OCPs if 90% of businesses have at least two OCPs within 100m.[43]

[41] 2015 BCMR, paragraph 4.136
[42] 2015 BCMR, paragraph 4.137

This requirement for multiple competing providers contrasts with the approach taken in the 2013 BCMR, and with academic analysis of competition. As the IIG submission sets out, this typically shows that two to three competing providers are sufficient for competition. This is consistent with the analysis undertaken in the two previous BCMRs when two competitors to BT were enough to define a separate market. This approach is also consistent with the approach taken in the WBA market.

The halving of the distance consideration from 200m in the last BCMR to 100m, also significantly raises the bar to establish which areas may be competitive.

The imposition of this high benchmark permits Ofcom to conclude in paragraphs 9.50 – 9.51 that nowhere outside London can become competitive.

This approach to determining the level of competition within the market has not been explained, nor has there been any justification as to why the methodology used in 2013 has not been applied in this review. This is inconsistent, and perverse, when *actual* competition in markets that were previously deemed competitive has increased since the last review.

Definition of the CLA

The CLA is defined by postcode according to two tests based on network reach.[44] The result is that the CLA is actually composed of three non-contiguous areas. The gap between the non-contiguous areas to the west of the central component is largely composed of Hyde Park. The gap to the east appears to be the area between Canary Wharf and the City of London.

We consider that defining the CLA non-contiguously is overly mechanistic and it has the potential to be gamed by CPs. This would primarily be a concern in the event that BT opted not to make DFA available nationwide (including the CLA). For example, a circuit could run from Canary Wharf in the east to the City of London from CLA to CLA – but via a route in the LP. Although the proposed CLA defined area is derived from a strict application of the network reach tests, it would be far more logical for the CLA to be a contiguous area – particularly given the ambiguity concerning the definition of dark fibre circuits that transverse the CLA and the LP, the implications of which are discussed below.

For example, a CP could request a dark fibre circuit out of the CLA into the LP (claiming it as an LP circuit) and then join up with a circuit going from the LP into another part of the CLA. In the event that BT opted not to provide DFA in the CLA, a CP could nevertheless game the CLA boundary by exploiting the non-contiguous nature of the CLA area definition.

This suggests that Ofcom has simply applied its methodology in a mechanistic way and has not fully considered the impact of defining the CLA in a non-contiguous manner.

Virgin Media does not consider that simply ‘filling in’ the missing areas of the CLA would remedy the approach, but that Ofcom needs to consider whether its approach to geographic analysis is sound given these perverse outcomes, both in splitting the WECLA (leading to a

[43] 2015 BCMR, paragraphs 4.91-4.92
[44] 2015 BCMR, paragraph A15.163

counter intuitive increase in regulation in the outer area of the WECLA), and in relation to the potential for hops across the CLA to be 'gamed' through the use of non-CLA pockets.

The anomalous result of having pockets of the LP within the CLA could result in a circuit being regulated on a different basis depending on where in, for example, Canary Wharf the circuit end was located. For circuits that start in one market and finish in another, the 'remote end' is usually the determinant of the relevant market. With dark fibre it is not clear how it would be possible to determine the remote end given that it is simple fibre and the use is not necessarily known to the provider. For example, if multiple eNodeBs are interconnected using a DFA link, before being backhauled to the core network, the MNO could specify the remote end tactically so that the remote site is located within the CLA and therefore is to be provided under the DFA remedy. This adds a further complication to determining how circuits may be classified under Ofcom's proposed geographic definition of the London markets.

In addition to the concerns set out above relating to the proposed definition of the market. The consequence of proposing two separate London markets effectively reintroduces regulation to the LP, undermining OCP investment previously made when that area was defined as the WECLA market. This regulatory instability will also raise uncertainty for any prospective new entrants in the future.

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

Virgin Media is, as noted in our response to Question 4.3, concerned that the overall effect of Ofcom's proposals is to increase regulation in the LP market for AISBO services, and to re-introduce regulation into a market (MISBO) that was previously found to be competitive.

As we have set out in our response to Questions 4.1 and 4.2, Virgin Media considers that, from the available evidence, it is clear that the market for high bandwidth services has become increasingly competitive since the last BCMR in 2013, and in that context, it is counter intuitive that this market should now fall within an SMP designation.

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

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

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

Ofcom proposes to build upon the current TAN concept as defined in the 2013 review. This recognises that, simplistically, conveyance between competitive locations should be regarded as core conveyance, and not within the regulated symmetric broadband origination market.

Virgin Media agrees with Ofcom that competition has increased since the last review and therefore agrees that Ofcom should leave the existing TANs in place and review whether more locations should now fall within the scope. Ofcom assess exchanges based upon the presence of two major OCPs with associated network presence. Ofcom needs to ensure that this does not overlook a CP's presence when the CP with exchange presence purchases a relevant qualifying product (such as Cablelink) in order to interconnect with a third party provider's network who would be supplying the backhaul. In such cases, this may result in, for example, Virgin Media being present and able to offer backhaul, but not showing up as a 'present CP' for the purposes of the test. Virgin Media welcomes Ofcom's further assessment of this aspect of the review, but would stress that the results of this further analysis need to be fully consulted upon.

In relation to data centres, Ofcom suggests that only carrier neutral data centres should be included in the competitive sector of the market, irrespective of how many CPs have presence at a centre. It is of note that even for carrier owned centres, the average CP presence is three,[45] suggesting that some will have considerably higher CP presence and may well be competitive.

Additionally, Ofcom further reduces the number of 'competitive' carrier neutral centres depending on whether they have multiple competitive routes from other competitive carrier neutral data centres to them. This appears to take a restrictive view of competition given that even data centres with one competitive route still have an average of three routes to them and three CPs present, which suggests that those at the higher end of the 'table' will have multiple routes and multiple CP presence, but will still not be sufficiently interconnected to be considered competitive. Ofcom notes the recent increase in competition in relation to data centres, a trend that is likely to continue through the review period. This supports our view that the analysis is too static and does not take account of the forward-look period and the likely position in the next three years.

The outcome of Ofcom's analysis is that of the 354 identified data centres, only 60 are deemed to be competitive. This number is low given the inherent high degree of interconnection at data centres, and suggests that Ofcom has again not justified its high bar for the assessment of competition.

Section 5: Market Assessment (Legacy Wholesale – TISBO)

Question 5.1: Do you agree with our proposal to identify a single product market for Traditional Interface Symmetric Broadband Origination (TISBO) services at low bandwidths with a single geographic market for the UK (excluding Hull)? If not, what alternative would you propose and why?

[45] 2015 BCMR, table A20.4

Question 5.2: Do you agree with our proposal not to identify any other Traditional Interface Symmetric Broadband Origination (TISBO) services above 2Mbit/s? If not, what alternative would you propose and why?

Question 5.3: Do you agree with our SMP assessment with respect to low bandwidth TISBO services? If not, what alternative would you propose and why?

Question 5.4: Do you agree with our approach to, and proposed product and geographic market definition for, wholesale TI trunk, including our proposal to treat 'regional trunk' segments as part of the TISBO market? If not, what alternative would you propose and why?

Virgin Media has not comments to make at this time.

Section 6: Hull Area

Question 6.1: Do you agree with our approach to (wholesale and retail) market definition in the Hull Area? If not, what alternative would you propose and why?

Question 6.2: Do you agree with our assessment of SMP to the markets for low bandwidth TISBO and CISBO services in the Hull Area? If not, what alternative would you propose and why?

Question 6.3: Do you agree with our assessment of SMP for the markets for low bandwidth TI and CI services in the Hull Area? If not, what alternative would you propose and why?

Question 6.4: Do you agree with our assessment of wholesale remedies not being sufficient to sustain effective competition in retail markets in the Hull Area? If not, what alternative would you propose and why?

Question 6.5: Do you agree with our finding that the three criteria test is met when applied to the retail markets in the Hull Area?

Virgin Media has not comments to make at this time.

Section 7: Remedies Approach

Question 7.1: Do you agree with our approach to assessing what remedies are appropriate to address the competition problems we have identified in the markets in which we propose to find that BT and KCOM have SMP? If not, please explain why, and what alternative approach you consider we should take.

Question 7.2: Do you agree with our assessment of the benefits that a package of passive and active remedies can offer relative to a package of active remedies only? If not, please explain why, giving your views on our assessment of these benefits, and providing any relevant evidence in support.

Question 7.3: Do you agree with our assessment of the risks associated with imposing passive remedies? If not, please explain why, giving your views on our assessment of these risks, and providing any relevant evidence in support.

Question 7.4: Do you agree that our proposal of a dark fibre remedy priced and designed in the way we have described in this consultation provides the best balance between the benefits and risks that we have identified? If not, please explain why, providing any relevant evidence in support, referencing specific aspects of our proposed remedy design where appropriate, and taking into account any comments you have made in response to questions 7.2 and 7.3.

Question 7.5: Do you agree with our assessment of passive remedies, and our proposal to include dark fibre in the package of remedies we propose to impose on BT? If not, please explain why.

The main focus of the questions asked in Section 7 of the consultation relate to Ofcom's proposal to require BT to provide DFA on regulated terms in parallel with active remedies based on the current suite of regulation.

We have many concerns regarding Ofcom's approach to the assessment of passive remedies. In particular, we consider Ofcom has failed:

- to identify the relevant competition concern;
- to be consistent with its intention to encourage investment in infrastructure;
- to evidence specific benefits of passive remedies;
- to undertake a full assessment of the risks of DFA; and
- to reflect the importance of maintaining infrastructure investment incentives.

We address each concern in turn below.

Identifying the Competition Concern

Virgin Media agrees with Ofcom that any remedy imposed should address an identified competition concern within the defined market.

Virgin Media considers that, in relation to the imposition of DFA, Ofcom has failed to identify a competition concern that *requires* the imposition of a DFA remedy.

The list of problems set out at paragraph 7.11 identifies issues relating to access, discrimination, pricing and quality of service, none of which *require* addressing through the introduction of passive remedies. At 7.39 Ofcom says that "*passive remedies can offer substantial benefits relative to imposing active remedies only*", but it does not identify the underlying competition problem, only suggesting that passives may bring more benefits. It is inappropriate to 'gold plate' regulation if there was no need to go beyond the existing remedies that are already in place. This would be contrary to the requirement for regulation to be proportionate imposed by section 47 of the Act.

Consistency with the overall intent to protect infrastructure investment

Ofcom states that its approach to the design of remedies is to regulate access in order to protect consumers and promote effective competition, innovation and choice, while promoting competition upstream, where this is sustainable, based on efficient investment in alternative infrastructure.[46]

It is instructive to compare this intent with Ofcom's approach in the 2013 review. In that review Ofcom set out its approach to "*promote effective competition in downstream markets by promoting competition in the long term at the wholesale level based on investment in economically efficient alternative infrastructure*".[47]

Virgin Media welcomes the consistency of intended approach purportedly taken by Ofcom between the two reviews. We note particularly the importance attached to alternative infrastructure.

In 2013, Ofcom said that it would need "*clear evidence to justify the* [imposition of passive remedies]"[48]. It determined that the specific benefits of passive remedies *"could to a large extent be achieved by"* active remedies[49].

Ofcom also noted the significant risks associated with passive remedies it identified that passive remedies could undermine significant infrastructure investments and "*discourage further expansion of such alternative networks infrastructure*".[50] Ofcom recognised the importance of regulatory stability for such investment where significant costs need to be sunk. Ofcom needed to "*be wary*" of making changes that may impact on the ability of alternative operators to recover their costs.

Although this need for regulatory stability was correctly taken account of in 2013, it is an even more important factor in today's market. For example, Virgin Media has, with Project Lightning, undertaken an ambitious £3bn network expansion programme. This investment is predicated on a regulatory environment that is conducive to investment.

In a recent report, HSBC note that pricing flexibility afforded to BT has underpinned its network investments and "[this has incentivised] *Virgin Media/Liberty Global to plan its own network investment programme. However, as both companies have made clear, such projects are contingent on continued good visibility in terms of the regulatory environment.*" The report goes on to conclude, "*it was in fact deregulation that triggered the desired investment – not enhanced regulation,* […]".[51]

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[46] 2015 BCMR, paragraph 1.25
[47] 2013 BCMR statement, paragraph 8.3
[48] 2013 BCMR statement, paragraph 8.9
[49] 2013 BCMR statement, paragraph 8.6
[50] 2013 BCMR statement, paragraph 8.93
[51] HSBC Global Research, UK Telecoms – Now for the Real Debate, May 2015, page 7

Liberty Global's announcement was welcomed by the Prime Minister as a *"vote of confidence in our long-term economic plan to support business and create jobs by building a superfast nation backed by world-class infrastructure"*.[52]

Benefits of Passive Remedies

Ofcom seeks to justify DFA on the basis of the benefits that it brings. The key benefit identified by Ofcom is the potential for greater innovation in the market.[53] However, as we set out in our response to the pre-consultation on passive remedies, we consider that innovation gains from passive remedies have been overstated. There is little discussion of these comments in the consultation, which appears not to address the issue of what actual innovation could be realised by the introduction of DFA, despite Annex 27 being devoted entirely to the issue of innovation. For example, Ofcom referred to dark fibre supporting C-RAN technology in its preliminary consultation.[54] Virgin Media commented that this contention was not supported by independent evidence, referencing articles that suggested that C-RAN could be based on Ethernet rather than dark fibre, and that C-RAN may not be compatible with dark fibre as it is more difficult to manage and troubleshoot than Ethernet. Commentary suggests that "*[t]he missing monitoring capability of dark fibre networks does not support detecting faults and service impairments*"[55] Our points have not been addressed by Ofcom; the only reference to C-RAN is by way of support for the imposition of DFA in footnote 200, yet it is not considered at all in Annex 27.

Virgin Media considers that the current active remedies already offer scope for new and innovative products to be developed. BT is required, by regulatory condition, to provide new network access products. As set out in Section 8,[56] Openreach's Statement of Requirements (SoR) process is the mechanism through which BT meets the BCMR new access request conditions for Ethernet services.

Ofcom previously considered the SoR process in 2013 and noted that BT was able to use its scale and scope to match the demand for innovation.[57] Therefore, provided the SoR process is working well, there is already an appropriate mechanism for delivering innovation in the market.

Virgin Media notes that there has been criticism of the SoR process, and indeed, Ofcom seeks to address this in Section 8. The SoR process is already under a 12-month review following the FAMR. This review is in progress and will determine whether a separate SoR project should be initiated,[58] Ofcom proposes that the concerns in relation to Ethernet SoRs are best addressed within this review (and potential future project).

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[52] See Virgin Media press release http://about.virginmedia.com/press-release/9467/virgin-media-and-liberty-global-announce-largest-investment-in-uks-internet-infrastructure-for-more-than-a-decade
[53] 2015 BCMR, paragraph 7.41 (bullet 1)
[54] 2014 Preliminary consultation on passive remedies, paragraph 4.15
[55] http://the-mobile-network.com/2014/06/why-c-ran-fronthaul-is-a-big-challenge-to-existing-network-infrastructure-technologies/
[56] 2015 BCMR, paragraph 8.38
[57] 2013 BCMR, paragraph 8.103
[58] 2015 BCMR, paragraph 8.41

The limitations of the current process are therefore under review. Virgin Media considers that, in so far that there are barriers to innovation, this review process (and potential future project) is the appropriate and proportionate way to investigate matters, certainly in the first instance. We note that despite comments made by stakeholders to Ofcom criticising the SoR process in the course of this review, there have been no formal complaints made to the Equality of Access Board (EAB) in 2013/2014.[59]

It would not be proportionate to attempt to stimulate innovation through the introduction of DFA, an entirely new and disruptive layer of regulation.

It is significant to note that in Ofcom's analysis of innovation in Annex 27, although it identifies some SoR requests that have not been delivered, of which 27% may have been able to be developed over passive infrastructure, it accepts that most of these services could have been technically deployed as active products.[60] Further, although Ofcom's analysis suggests that 27% of 'non-delivered' SoRs could have been developed over passive infrastructure, the number of requests from CPs outside of BT Group only accounts for 45 requests, less than 24% of the total for the eight-year period 2006 to 2014.[61] This is without considering that 31% of non-delivered requests are customer cancelled[62] (because the request is no longer needed or it is captured under a different SoR). In that regard, applying both the 31% (to reflect customer cancellations) and the 27% (to reflect potential passive development) to the 45 CP SoR requests, passive remedies may have been able to provide for only eight solutions for rejected SoRs over eight years, one solution per year. Overall, it is hard to conclude that the implementation of an entirely new and disruptive remedy is proportionate if it provides so few innovation benefits (which could be provided through an active solution).

Ofcom also assesses whether innovation would be facilitated by passive remedies outside of the SoR analysis. In Tables A27.11 and A27.12, it sets out examples provided by other CPs of potential innovations. Although some of the responses are confidential, those that are published do not appear to be aimed at achieving a degree of efficiency gain by cutting out Openreach from part of an existing process.[63] Whilst efficiency is a consideration in its own right, it should not be confused with the identified benefit of innovation.

Ofcom cannot point to a single major technology or application that would emerge following the introduction of passive remedies. Rather, it simply suggests that the examples provided in Annex 27 show the *"variation in approach to technology choices and deployment options"*[64].

[59] 2015 BCMR, paragraph 8.42
[60] 2015 BCMR, paragraph A27.8
[61] 2015 BCMR, table A27.2
[62] 2015 BCMR, paragraphs A27.31 – 52 SoR rejected; 59 SoR cancelled.
[63] See Vodafone: using enhanced NTE; Six Degrees Group: bearer upgrades without the need to coordinate with Openreach; replacement of Openreach devices with customer device; Sky: replacement of Openreach NTE with Sky NTE;
[64] 2015 BCMR, paragraph A27.48

Ofcom Assessment of Risks of Dark Fibre Access

Ofcom does purport to assess the potential risks of implementing dark fibre. Although the identified risks are described as *"substantial"* by Ofcom, the entire discussion suggests that any material risk can be sufficiently mitigated by the design of the remedy, and in particular the way that it is priced.

It is notable that this is in contrast to the position taken in 2013, when, as noted above, the identified risks were such that passive remedies were not deemed appropriate. Largely, the identified risks do not appear to have changed between 2013 and this review.

We specifically address the pricing approach proposed by Ofcom later in this response, but whilst Ofcom identifies the risk of undermining CPs' incentives to invest, it does not undertake any substantive analysis of the magnitude of this risk, especially how much of that risk remains in the face of the proposed pricing approach.

Virgin Media is concerned that a significant risk to investment exists if Ofcom's proposals on DFA pricing remain. Ofcom should assess this risk: it must be central to any assessment of the proportionality of the proposed remedy. This assessment is absent from the consultation, and, in this context, Virgin Media submits that it is premature for Ofcom to consider putting in place a radically new remedy based on passive access. At a minimum, Ofcom needs to conduct further analysis of this issue in a similar manner to that set out in the IIG's impact analysis.. It is clear that there is a very real risk that the claimed 'protection' is not achieved by the design of the remedy.

The importance of maintaining infrastructure investment incentives

The benefits to competition, and ultimately to consumers, that end-to-end infrastructure competition brings is well established in economic literature. Academics have consistently shown that, both in theory and in practice, the presence of competitors, with independent infrastructure capabilities, act as a constraint on incumbent operators, which typically have market power in upstream and downstream markets. While service-based competition and regulatory remedies that encourage it can play a part, they are an imperfect substitute for real like-for-like competition. The IIG response refers to a sample of the wide range of papers and empirical studies that identify the benefits to consumers, to investment, to quality of service and to OCPs of effective infrastructure competition.

The presence of infrastructure-level competitors constrains a dominant operator from acting on its incentives to 'soften' the retail market and leverage its power in wholesale inputs extracting excess returns. With service-centric competition, the only safeguards in place are regulatory remedies or competition law. As noted in Virgin Media's response to Ofcom's preliminary consultation on passive remedies, the ladder of investment theory, often used to justify access obligations and passive remedies has been critically reviewed in academic literature since it was originally conceived. Evidence suggests that OCPs actually delay infrastructure investment when passive remedies are available.

In contrast, 'end-to-end' infrastructure competition forces continued investment and innovation by the dominant incumbent. Under Ofcom's proposed DFA remedy, this end-to-end competition will be undermined, with the long-term result being a market which is overwhelmingly dependent on BT for wholesale inputs and which is not protected by having alternative wholesale providers, such as Virgin Media. Literature on the topic has shown that infrastructure unbundling such as DFA can have a stifling effect on infrastructure competition and the incentive for OCPs to invest in their own infrastructure. Ofcom's DFA remedy is entirely at odds with what theory and practice show to be beneficial for customers in the long term.

Ofcom notes that a major barrier to OCPs in competing with BT is 'network reach' and the difference in marginal cost that exists between BT and OCPs. The effective marginal cost to serve is impacted by having nearby infrastructure and high enough customer density to share common cost recovery. The primary mechanism for reducing this cost differential is the expansion of network infrastructure presence, underpinned by growth in service volumes: essentially gains from economies of scale. The imposition of a DFA remedy would curtail the dynamic process that Virgin Media and other infrastructure investors are currently undertaking. OCPs have been working to gain market share and expand their coverage, Ofcom's proposals will unwind this and drive more volumes back to BT. It seems short-sighted to assume that other CBDs across the UK such as Manchester,[65] will not be targeted by OCPs under the current active remedies. Ofcom's forward looking competition assessment should take proper account of the planned investment activities of Virgin Media (and other IIG members) when considering the prospect of future competition and not implement remedies that will forestall these future investments.

By adopting DFA, particularly in its current form, Ofcom is dismissing the value of dynamic efficiency, and is abandoning the prospect of end-to-end competition as a bulwark against BT's market power in this review period and in the future. The DFA remedy effectively introduces a ceiling on pricing of all active services for all CPs. The remedy will have an impact on BT's operations, but it will also impact substantially and constrain OCPs. Such a constraint will likely lead to Virgin Media and other infrastructure investors finding it unprofitable to connect and serve a larger proportion of potential customers than without the DFA remedy. Ofcom's remedy effectively amplifies the infrastructure reach issue that Ofcom acknowledges exists for OCPs. By effectively placing a, very low, ceiling on future active prices the DFA remedy will make it less likely that OCPs will find it commercially viable to serve customers.

Ofcom can be under no doubt that its current proposed DFA remedies are fundamentally at odds with findings in theoretical academic literature, empirical evidence and intuitive reason on the appropriate mechanisms to encouraging end-to-end competition - which Virgin Media believes Ofcom should prioritise as a key tool in achieving its regulatory objectives. The dynamic value that end-to-end competition provides should be afforded the utmost consideration when considering the impact of regulation. It is a primary driver of innovation

[65] In June 2015 Virgin Media launched Project Lightning in Manchester, breaking ground on the connecting the first 20,000 homes and businesses, with further phases expected to add another 130,000 locations.

and a strong constraint on dominant operators (independent of, and complimentary to, regulatory remedies).

Section 8 – Remedies – General Remedies

Question 8.1: Do you agree with the general remedies that we propose for BT in the wholesale TISBO and CISBO markets? If not, what alternative remedies would you propose and why?

Virgin Media considers that the proposals set out by Ofcom are broadly appropriate, given that they are largely carried forward from current conditions, with proposed adjustments to reflect specific issues identified in this review. We comment on the following specific proposals.

Fair and reasonable Pricing

Ofcom suggests that fair and reasonable pricing is required to provide a constraint so that products "*offered are consistent with those which would be offered in a competitive market, sensible, practical, and do not impose a margin squeeze on competitors*".[66] This serves the purpose of providing appropriate protection to new services outside the scope of the charge control.

It is significant that whilst fair and reasonable is considered appropriate in this context, it does not appear to have been given the same consideration in relation to DFA pricing.

New Network Access

As we noted above, Ofcom is proposing to consider the SoR monitoring programme initiated under the FAMR to determine how requests for new network access are delivered. Virgin Media considers that innovation benefits from DFA are largely illusory and CPs can be adequately served by active remedies. In this context, Virgin Media supports the review of the SoR process and the proposal to await its outcome later this year.

Section 9 – Remedies – CISBO DFA

Question 9.1: Do you agree with our proposals in relation to the dark fibre remedy? If not, what alternative dark fibre remedy would you propose and why?

Question 9.2: Do you agree with our proposals in relation to the pricing of dark fibre? If not, please explain why, and what alternative approach you consider we should take.

Virgin Media does not agree with the proposed implementation of Dark Fibre. In this section, we address:

- the legal tests required to be met for the imposition of any remedy;

[66] 2015 BCMR, paragraph 8.19

- Ofcom's proposal for unrestricted use;
- Ofcom's proposals for price regulation, including the choice of reference product; and
- Ofcom's proposal to impose a 50km distance limit.

Legal Tests

Ofcom is required under the framework set out in the Communications Act to consider whether the proposed regulation meets the various statutory tests. Virgin Media considers that Ofcom's analysis in this regard is flawed and inadequate.

In the face of a finding of SMP, where a CP has an incentive not to allow access to its network, an appropriate network access condition can be imposed to address this concern. This incentive was found to exist in the 2013 review, but was addressed by the imposition of active remedies. Virgin Media considers that it is not necessary to impose DFA to allow network access, or to achieve Ofcom's stated aim of enabling non-network investing CPs to compete. It is particularly striking that in Section 10 of the consultation, in justifying proposals relating to active remedies, Ofcom cites the exact same reason for the imposition of active regulation.[67]

There is a lack of rigour in applying the legal tests under section 47 tests. Ofcom considers each element of the test in turn, namely that the condition is:

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

However, rather than a proper consideration of the tests, Ofcom simply makes a bold and unsupported statement that each of the elements are satisfied.

In respect of the first limb, the only justification provided is to "*facilitate and encourage access to BT's network and therefore promote competition to the benefit of consumers*".[68] Virgin Media does not believe this adequately sets out the justification for the imposition of such an intrusive and disruptive remedy, particularly when, on Ofcom's own analysis[69] an active remedy will achieve (and already is achieving) this aim. Any justification would need to consider why DFA was required *in addition* to access to BT's active products.

Virgin Media's response to Ofcom's preliminary consultation on passive remedies set out in detail why infrastructure competition delivers better benefits than passive access and why the 'ladder of investment' theory is not supported by evidence.

[67] 2015 BCMR, paragraph 10.75
[68] 2015 BCMR, paragraph 9.55
[69] 2015 BCMR, paragraph 10.75

Nowhere in the current consultation does Ofcom address Virgin Media's comments in relation to the 'ladder of investment' theory. The lack of any identified competition problem, and the lack of clear evidence on the benefits of passive remedies over the currently available active remedies, means that Ofcom has failed to satisfy the test that a requirement for BT to offer dark fibre access is objectively justifiable.

In relation to the question, under the second limb of section 47, of whether the proposal to require DFA is not unduly discriminatory, Ofcom simply suggests that as the condition is only applied to BT as the SMP designate in the market the test is met. Virgin Media considers that this fails to address the requirement.

In concluding that the proposed regulation is not unduly discriminatory, Ofcom has failed to take account of the effects of the proposal on other CPs. Virgin Media considers that, as proposed, there is a very real risk that the condition would unduly discriminate against infrastructure investing CPs, to the benefit of those CPs who purchase terminating segments. This is issue is explored further in the separate submission of the IIG, which sets out the detrimental impact to other infrastructure investors.

Furthermore, section 47(2)(c) imposes a requirement that the proposed regulation must be proportionate in relation to what it is intended to achieve. This requires Ofcom to consider the remedy and ensure that it is the least intrusive remedy to achieve the aim of addressing the identified competition concern.

Ofcom suggests that the remedy is proportionate as it is "*targeted at addressing the market power we propose BT holds in these markets and does not require it to provide access if it is not technically feasible or reasonable*".[70]

This explanation does not address whether the remedy is the least intrusive way of providing access. There is a fundamental difficulty in that Ofcom has not set out the competition concern that the remedy needs to be tested against: is impossible to assess the least intrusive way of achieving something when that 'something' is not specified.

We have already set out in our response why we consider the imposition of a dark fibre remedy to be disproportionate over and above the existing active remedies proposed (which allow access to BT's network), and consider that the benefits discussed by Ofcom in the consultation are insufficient to outweigh the risks and disadvantages associated with the imposition of dark fibre. The issue of proportionality is a key element of whether Ofcom has any legal basis under which it can impose this remedy, yet Ofcom has approached this issue in an entirely cursory manner, providing a justification that is neither reasoned nor supported by any evidence.

Finally, Ofcom suggests that the remedy is transparent because it has a clear intention. Whilst we do not seek to comment on the clarity of drafting of the proposed condition (but note that the availability of dark fibre and other connectivity is far from straightforward when considering the competitive edge between CI and CI Core areas), Virgin Media considers

[70] 2015 BCMR, paragraph 9.55

that the superficial assessment applied to this final limb of section 47 shows a consistent lack of consideration as to whether there is a valid legal basis for the imposition of this remedy.

Unrestricted Use

Ofcom proposes that the DFA remedy should be available across the CISBO market (LP and RoUK) without any restriction on its use.

Ofcom justifies the imposition of a dark fibre remedy nationally noting that restricting its operation to a particular geography or usage would be difficult to police. Virgin Media accepts that an unrestricted dark fibre product would be easier to regulate than one that required significant restrictions on its use. However, Virgin Media is concerned that the market analysis undertaken by Ofcom in relation to the proposed CISBO market is flawed and inadequate. We have set this out in our response to Question 3, above. If there is a separate market for higher bandwidth products (which we believe to be the case), or even for WDM based products, it is likely that this would be found to be competitive, in which case no SMP remedy can be imposed. In those circumstances, it would be unsustainable for a dark fibre remedy to be implemented that is restricted to certain bandwidths / technologies, for the very reason that Ofcom cites as supporting a nationally available unrestricted remedy, namely, that such restrictions would be impractical to police.

Dark Fibre Pricing

Ofcom's approach to the regulation of DFA pricing is set out in Annex 26 of the consultation; section 9 then simply 'tests' the proposed value minus approach against the legal tests contained within the Communications Act, on a preliminary basis, noting that any pricing condition would be set as part of the LLCC.

As noted above (and clearly accepted by Ofcom in the 2013 BCMR) the introduction of passive remedies is a major regulatory intervention. Dark fibre has not been offered by Openreach previously, and therefore issues such as take up and use remain uncertain. This type of intervention carries a high degree of regulatory risk. In determining the appropriate form of any DFA remedy, Ofcom should follow its own reasoning as set out in 2013, and adopt a "*wary*" approach.

In particular, the European Commission provides NRAs with greater discretion over the appropriate pricing methodologies for products where there is significant demand uncertainty. It could be argued that this applies to dark fibre, and points to a more light-touch remedy being imposed. The EU states that:

> *"Due to current demand uncertainty regarding the provision of very-high speed broadband services it is important in order to promote efficient investment and innovation, in accordance with Article 8(5)(d) of Directive 2002/21/EC, to allow those operators investing in NGA networks a certain degree of pricing flexibility to test price points and conduct appropriate penetration pricing. This would allow SMP operators and access seekers to share some of the investment risk by differentiating wholesale access prices according to the access seekers' level of*

commitment. This could result in lower prices for long-term agreements with volume guarantees, which could reflect access seekers taking on some of the risks associated with uncertain demand. In addition, pricing flexibility at wholesale level is necessary to allow both the access seeker and the SMP operator's retail business to introduce price differentiation on the retail broadband market in order to better address consumer preferences and foster penetration of very high-speed broadband services. In line with points 48-57, to prevent such pricing flexibility leading to excessive prices in markets where SMP has been found, it should be accompanied by additional safeguards to protect competition. To this end, the stricter non-discrimination obligation, i.e. EoI and technical replicability, should be complemented by guaranteed economic replicability of downstream products in conjunction with price regulation of copper wholesale access products"[71].

In Annex 26, Ofcom considers the most appropriate pricing approach for dark fibre. It undertakes a comparative assessment between cost based pricing, "active basket" pricing and "active reference pricing". In advance of this assessment, Ofcom briefly considers using a more light touch option: the FRAND requirement in the proposed Access SMP Condition, for charges to be fair and reasonable. Ofcom rejects this approach by arguing that:

- CPs responding to the CFI did not favour such an approach; and
- such an approach would not provide sufficient clarity of pricing and would lead to disputes, which are typically not appropriate vehicles to set major policy.[72]

Virgin Media view is that this superficial consideration of FRAND ignores the impact of other approaches on the market. FRAND obligations have been successfully implemented in other markets where new and ground-breaking regulation has been imposed. In particular, in the 2010 WLA review, the new VULA remedy was imposed on BT, in order to open up its local loop for the provision of wholesale high speed broadband. In setting the regulated price for this product, Ofcom took account of the need to ensure that investment incentives were maintained to encourage continued fibre rollout and recognised the consequential need to allow BT a high degree of pricing flexibility.

This approach was successful in that in the subsequent FAMR, Ofcom specifically noted (in the context of setting more prescriptive regulation in the form of the VULA Margin Condition), investment incentives had been maintained in the interim period, noting in particular the investment made by BT in rolling out FTTC.[73]

Furthermore, the relative success of this 'light touch' approach to virtual unbundling was also recognised by the Commission, which essentially endorsed it in its Recommendation.[74]

It is notable that no additional guidance was required beyond the access condition itself, recognising that BT had a high degree of pricing flexibility was sufficient guidance for BT's customers to recognise that Ofcom would not be likely to intervene in a pricing issue in the

[71] Paragraphs 49 to 50 of Commission recommendation on consistent non-discrimination obligations and costing methodologies to promote competition and enhance the broadband investment environment - C(2013) 5761
[72] 2015 BCMR, paragraph A26.94
[73] 2015 FAMR – Approach to the VULA Margin, paragraph 3.120
[74] Commission Recommendation, C(2013) 5761 Final

early life of the remedy, and then only when specific competition concerns were identified. This approach did not lead to the raising of innumerable disputes, or to the failure of the remedy. It also allowed Ofcom to review the approach in the subsequent FAMR, in which it considered that additional regulation would be appropriate.

Therefore, in failing to consider fully the appropriateness of this remedy, Ofcom has ignored the potentially best and most relevant precedent to the introduction of pricing remedies on a new passive access product. Virgin Media considers that this is an important flaw in Ofcom's assessment.

Turning to the three approaches that Ofcom did review in the consultation, Ofcom assesses each of the approaches against a series of considerations, scoring each measure using the 'shaded ball' method.

Efficiency is considered in the context of allocative efficiency, productive efficiency, dynamic efficiency (active investment) and dynamic efficiency (passive investment).

Unsurprisingly, the more interventionist the approach (getting closer to pure cost pricing), the more extreme the results, with cost based pricing scoring 'fully shaded' for dynamic (active) efficiency and 'no shading' for dynamic (passive) efficiency.

This leads to a result where the reference product approach (see Table A26.8) is advocated by virtue of having half or fully shaded balls in all categories.

Ofcom recognises that the imposition of a price regulated passive product has the ability to undermine CPs' investment incentives, with lower regulated pricing leading to lower prices and fewer on-net fibre solutions (and therefore lower use of their duct and fibre access assets). This in turn leads to lower profits on existing infrastructure and lower than expected returns on new duct / fibre construction, lowering the incentive to invest as a result.[75]

However, under its scoring system, Ofcom (correctly) rates a reference product approach as being better to mitigate this risk than either a cost based or active basket approach. Therefore, this allows Ofcom to conclude that a reference product approach is consistent with the need to protect the incentive to invest.

This rationale contains flawed logic: the assessment of a poor remedy in comparison to even worse remedies does not justify the poor remedy. Ofcom's apparent reliance upon this analysis to conclude that a reference product approach sufficiently mitigates the risks against reduced or eliminated investment incentives is therefore misconceived. Virgin Media submits that none of the approaches compared adequately mitigates the risk; the reference product approach just does it better than the others that Ofcom considers.

In particular, Ofcom suggests that the reference product approach would preserve *"more value in the high value part of the leased line market"*[76]. The proposed approach of using

[75] 2015 BCMR, paragraph A26.125
[76] 2015 BCMR, paragraph A26.127

1Gbit/s EAD as the reference product means that, on Ofcom's own analysis, *all* connections to active services above this bandwidth will be cannibalised by the proposed DFA product,[77] thus preserving *no* value in the high value part of the market.

Virgin Media estimates that the dark fibre remedy will result in foregone revenues of £[✂] - £[✂] during this review period. In addition, there is significant uncertainty regarding the longer-term impact on customer demand for active services, existing suppliers and the prospect of new entry.

The estimated impact is driven by service volumes migrating to BT and by the price erosion of retained services ([✂]). [✂]. This analysis reinforces Virgin Media's view that the proposed remedy will cause material harm to the existing market, particularly to non-BT infrastructure providers. A large proportion of the impact is as a result of cannibalisation of 1Gbit/s services. This result indicates that the choice of a 1Gbit/s reference product has a significant impact on high, as well as very high bandwidth, services and therefore the choice of the 1Gbit/s EAD reference product should be reconsidered.

These estimates are for the two-year period of 2017-18 and 2018-19. [✂].

As we have noted earlier in this response, Virgin Media's current investment in Project Lightning is designed to support network expansion on a modular basis, with sequential 'check points' throughout. Should investment incentives be reduced, this could lead to investment being redirected from the UK to other parts of the Liberty Global Group before the completion of the overall project, depriving the UK of substantial economic and employment benefits.

Choice of benchmark product

Having reached the provisional view that a reference product approach is appropriate, Ofcom then goes on to consider what the appropriate reference product should be.

Ofcom chooses EAD as the relevant active product and notes that there are only two options for a reference product, 100Mbit/s and 1Gbit/s. Ofcom concludes that the 1Gbit/s service is more suitable to achieve the "*policy objective of preserving to some extent the bandwidth gradient*"[78]

Ofcom does consider Openreach's soon to be launched Ethernet 10Gbit/s product, but simply concludes that as it is only expected to account for a small number of circuits in the forward look period, it would not be suitable to support a *"material level of use of a passive access product"*.

Virgin Media considers this analysis to be flawed.

[77] 2015 LLCC, paragraph A6.16
[78] 2015 BCMR, paragraph A26.151

Again, Ofcom has compared two options and concluded that the least worst (1Gbit/s versus 100Mbit/s) is the most appropriate. This reasoning is inadequate, and the specific effects of imposing a 1Gbit/s reference product need to be fully considered.

Furthermore, Ofcom's assessment of the 10Gbit/s product is superficial, and its appropriateness as a benchmark is dismissed on the basis that it would mean that DFA would not be widely taken up.[79] Although, if dark fibre really does bring innovation benefits, this is surely not the case. In any event, the limited use of 10Gbit/s circuits is an inappropriate basis to disregard the service as an appropriate reference. The current commercial use of dark fibre is for high bandwidth solutions which we consider to be a more prevalent substitute for very high bandwidth circuits, such 10Gbit/s. It is especially relevant to note that the currently vibrant dark fibre market in the CLA supports such a contention.

Openreach's indicative pricing of 10Gbit/s EAD would also mean that Ofcom's intent to preserve the high bandwidth market and maintain investment incentives would be far better achieved by using this product as a benchmark rather than the 1Gbit/s variant, by limiting the impact that DFA will have on active service pricing.

Other Options

Ofcom seemingly does not consider the current basis upon which dark fibre is priced to be a significant input into the current analysis. Virgin Media believes this to be a significant omission.

There are two sources of information that Ofcom should have regard to: a) the commercial supply of dark fibre in the UK; and b) the position in Europe for the regulated supply of dark fibre.

UK Dark Fibre Market

The market in the UK for dark fibre is fast developing and has proved to be attractive to infrastructure investors. It is significant that there has been a degree of both market entry and international investment over the period of the last review, for example with Zayo's acquisition of Geo Networks, and its subsequent investment in the UK.

The CLA, in particular, contains a significant amount of dark fibre with a number of CPs competing in this market (see Annex 1).

It is therefore vital that Ofcom has regard to the commercial price at which dark fibre is available. This analysis could lead to a potential benchmark price for dark fibre (or given that it is the prevailing commercial price, could provide an indication of whether BT's approach to pricing was fair and reasonable in areas with less competition).

[79] It is also the case that if there were genuine innovation, then Dark Fibre would be taken up irrespective of the bandwidth of the reference product.

Additionally, Ofcom has to consider the impact of regulated dark fibre on the proposed competitive CLA. If Ofcom was to mandate DFA based on a 1Gbit/s EAD reference product this would create a situation where the competitive market price in the CLA would be undercut by a regulated (artificially) low price in the surrounding LP/RoUK markets. If BT maintained a single geographic price for dark fibre across all markets,[80] this could have the effect of undercutting competitive providers within the CLA, and potentially foreclosing that market. It would be contrary to Ofcom's duties (and expressed intentions) to drive competition out of the market, and, in the long-term, reinstitute BT as a monopoly provider. Any short-term gain for downstream CP customers would be entirely overshadowed by undermining the long-term viability of competition.

European Position

Ofcom's proposed approach of highly prescriptive dark fibre price regulation contrasts with the approach taken by some other NRAs in Europe.

A significant number of NRAs only allow DFA when duct access (where it has been deemed appropriate) is not possible.

Other NRAs regulate DFA on the basis of commercial negotiation, and do not specifically regulate pricing.[81]

Whilst it is clear that there is no consistent and uniform precedent that can be observed in Europe, it is equally clear that a light touch approach to pricing regulation is taken by other NRAs. This again would support Ofcom adopting a cautious approach when designing this new and intrusive remedy.

50km Distance Limit

Ofcom has identified that a failure to impose a distance limit on DFA may undermine existing infrastructure investments in the competitive market for core conveyance.[82] Virgin Media agrees and considers that there need to be effective safeguards so that any remedy (imposed to address identified SMP) is only used in relation to the specific market in question, without risk that it leaks into adjacent competitive markets, damaging commercial incentives to compete and invest.

Ofcom has already identified that it is difficult to police the use to which dark fibre is put, so the need to set an appropriate distance as a proxy for appropriate use is all the more important.

Ofcom proposes that a distance limit of 50Km is appropriate for DFA, as this will enable connectivity between 90% of ASNs and "competitive" core nodes.

This is significantly different from the approach taken towards EAD products. Although, as Ofcom notes, there is no explicit regulatory distance limitation imposed in relation to EAD

[80] BT have previously adopted National pricing for Ethernet products across geographic boundaries.
[81] France and Portugal
[82] 2015 BCMR, paragraph A25.101

circuits, this is because the risk of use for core conveyance is minimised by BT's specifications for its wholesale services, which impose their own distance limits.

Virgin Media considers that the risk of DFA being used for core conveyance is higher than for EAD, given its inherent flexibility of use. It is therefore counter-intuitive that DFA should have a greater distance allowance than EAD, which has a limit (albeit imposed by BT) of 25km.

Given the need to approach regulation cautiously, and to maintain consistency, Virgin Media considers that the alignment of DFA with EAD should include distance alignment and the reach of DFA should be limited at 25km, at least initially. This would still ensure that around 80% of ASNs are in reach of competitive core nodes,[83] whilst significantly lessening the risk of inappropriate core conveyance use.

Ofcom also suggests that the use of 50km would "*be sufficient*" to meet access requirements as it exceeds the straight-line distances of BT's EAD services. This suggests that the remedy design, at least in relation to access requirements, is in excess of what is required. Aligning the distance requirement with EAD distance specifications would ensure that the regulatory design remained proportionate and consistent with existing products.

Section 10 – Remedies – CISBO Active Remedies

Question 10.1: Do you agree with the specific active remedies that we propose for BT in the wholesale CISBO markets? If not, what alternative active remedies would you propose and why?

Local Access Pricing

Ofcom has identified a concern regarding the disproportionate use of EADLA solutions by BT Group companies, given a pricing advantage over CPs who use higher priced EAD links.

This is something that has concerned Virgin Media, especially in light of the pricing strategy adopted by BT in relation to its active products. For example, in mid-2014, BT announced price cuts for its legacy Ethernet WES services. The price cuts were concentrated on WESLA products relative to the non-local exchange WES variant. This was important for Virgin Media: we have a significant number of WES circuits,[84] but minimal WESLA. Our concern is that the regulations permit BT to make price changes that favour BT Group (which takes proportionately more LA variant products) over major rivals such as Virgin Media (which predominantly uses standard variant circuits). Whilst EADLA has significant take up amongst unbundled operators, the majority of unbundling only occurred once EAD (EADLA) had been developed. This suggests that the major user of WESLA circuits would be BT Group companies.[85]

[83] 2015 BCMR, Figure A25.1 (approximated from)
[84] At the time of the price change approximately 40% of relevant VM circuits were WES/WEES.
[85] We understand that major unbundled operators, such as TT, do not rely on WES / WESLA variants to support connectivity to their unbundled exchanges.

Therefore, Virgin Media agrees with the proposal to ensure that the differential between LA and non-LA products is maintained at LRIC; this will ensure that any risk of gaming the control (within the rules) to skew the playing field will be eliminated. However, this approach should not be limited to EAD services, but extended to legacy services which remain significant in terms of volume, and for the reasons set out above, provide a greater incentive for BT to 'game' the rules, given their relative limited use in local access form by unbundled operators.

Project Services

Ofcom has noted concerns raised both by Virgin Media and TalkTalk in relation to the use of Project Services in an attempt to mitigate failings by BT in the timely provisioning of services.

Ofcom proposes that there is no reason to introduce regulation when the review of quality of service has been undertaken with proposals to address the underlying problem. Virgin Media agrees that the quality of service provided by Openreach has been poor and is in need of review within the BCMR: we comment on this aspect of the proposals below. Ofcom will need to ensure that, if imposed, the proposed approach to improving quality of service is effective in eliminating the need to rely on 'add-on' services, such as Project Services, as a way of mitigating provisioning failures.

Section 11 – Remedies – TISBO

Question 11.1: Do you agree with the PPC Direction that we propose for BT in the wholesale TISBO market? If not, what alternative would you propose and why?

Virgin Media has no comments to make at this time.

Section 12 – Remedies – Interconnection / Accommodation

Question 12.1: Do you agree with the interconnection and accommodation remedies that we propose for BT in the wholesale TISBO and CISBO markets? If not, what alternative remedies would you propose and why?

Virgin Media notes Ofcom's comments in relation to Cablelink. We agree that this is a vital product, and that issues associated with provisioning and quality of service can be masked due to its relatively low volumes and low cost. As a necessary link in many solutions provided by non-BT CPs, a 'failure' on Cablelink can significantly compromise the end-to-end solution, and therefore we welcome Ofcom's proposals in relation to QoS, which we respond to below.

Section 13 – Remedies QoS

Question 13.1: Do you agree with our assessment of Openreach's Ethernet provisioning process, how it has been working in practice, the root causes of performance deterioration and process developments? Does our assessment reflect your experiences and *understanding of Openreach's wholesale Ethernet provisioning performance? If not, please explain why and provide us with any supporting evidence.*

Question 13.2: Do you agree with our provisional conclusions on Openreach's performance? If not, please explain why, and provide us with any further supporting evidence.

Question 13.3: Have we accurately captured the reported impact of poor performance? If not, please explain why and provide us with any further supporting evidence.

Question 13.4: Do you agree with our assessment of Openreach's incentives to deliver acceptable Ethernet provisioning quality of service? If not, please explain why and provide us with any further supporting evidence.

Question 13.5: Do you agree that it is appropriate to exclude customer caused delays from the minimum standard performance measures for provision activities? If not, please explain why.

Question 13.6: Do you agree that it is appropriate to include the "non-customer" delays (also including Third Party delay in Openreach data) in the minimum standard performance measures for provision activities? If not, please explain why.

Question 13.7: Do you agree that it is appropriate to include delays due to events covered by MBORC declarations in the minimum standard performance measures for provision and repair activities? If not, please explain why.

Question 13.8: Do you agree that it is appropriate to apply the minimum standards nationally? If not, please explain why.

Question 13.9: Do you agree with our proposals regarding the application of minimum standards over the three year period of this review? If not, please set out your reasons and alternative proposals.

Question 13.10: Do you agree that it is appropriate to use a combination of initial CDD and TTP as the basis around which to set the new delivery date certainty minimum standards? Please provide reasoning for your answer. If you do not agree, please also give your proposed alternative including reasoning.

Question 13.11: Do you agree that it is appropriate to set the metrics for the delivery time certainty minimum standard to the initial value of 80% and final value of 90%? Please provide reasoning for your answer. If you do not agree, please also give your proposed alternative.

Question 13.12: Do you agree that it is appropriate to apply limits to mean TTP and upper (97%) and lower (40%) percentiles as the basis for the lead time minimum standard? Please provide reasoning for your answer. If you do not agree, please also give your proposed alternative.

Question 13.13: Do you agree that it is appropriate to set the upper percentile initial and final values to 159 and 118 working days and the lower percentile initial and final values to 30 and 29 working days for the lead time minimum standard to the values? Please provide reasoning for your answer. If you do not agree, please also give your proposed alternative.
Question 13.14: Do you agree that it is appropriate to set the repair time minimum standard to 94%? Please provide reasoning for your answer. If you do not agree, please also give your proposed alternative.

Question 13.15: Do you agree with our proposal to set a new SMP services condition which provides for Ofcom to direct BT to comply with all such quality of service requirements in relation to network access provided by BT pursuant to our proposed general and specific network access requirements? If not, please explain why.

Question 13.16: Do you agree that it is appropriate to assess compliance with the proposed minimum standards on an annual basis? If not, please explain why.

Question 13.17: Do you agree with our proposals to direct BT to comply with minimum performance standards for setting initial contractual delivery dates, delivery against initial contractual delivery dates, fault repair performance and overall mean time to provide? If not, please explain why, and set out your proposed alternative.

Question 13.18: Do you agree with our proposals to direct BT to provide the KPIs we have specified? If not, please explain why, and set out your proposed alternative.

Question 13.19: Do you agree with our proposals to maintain the existing SLG Direction? If not, please explain why, and set out your proposed alternative.

Question 13.20: Do you agree with our proposals regarding the conduct of, and principles and criteria to be applied from now on, to contractual negotiations concerning SLAs/SLGs for the provision of Ethernet services? If not, please explain why, and set out your proposed alternative.

Virgin Media agrees that there is scope for improvement to Openreach quality of service. It is notable that Ofcom, in proposing regulation, has identified a specific competition problem in that Openreach's failure to deliver appropriate levels of service is harming the delivery of service provided to purchasers of regulated inputs.

We have previously identified concerns with Openreach provision of Cablelink[86] as an example of where issues with service delivery and support have fallen well short of required standards, which in turn affects our ability to service end users. These also affect our ability to attract new customers requiring similar solutions, as lead times cannot be provided with sufficient certainty. As Ofcom identifies, the issue with Cablelink is unique to competitors of BT, so it is of particular concern when a major competitor to BT is not able to provide such key information when tendering for new business.

[86] See Virgin Media response to Call for Inputs

However, while it is right to ensure that BT meets its delivery obligations and does not discriminate between the level of service delivered to its own operations and those of its competitors, it is important that Ofcom takes full account of the wider implications of any regulation imposed to achieve this aim. In particular, whilst there is a need to ensure that an appropriate quality of service is provided, it would be inappropriate to over-regulate the manner of provision to the extent that this would negatively affect competition by undermining the investment incentives of competing infrastructure providers.

It is of note that Ofcom identifies that the incentives Openreach may have had to invest in maintaining or improving quality could have been outweighed by incentives to reduce costs.[87] The provisional conclusion drawn by Ofcom in paragraph 13.68 of the consultation is that the deterioration of service has been caused, in part, by under resourcing. In particular, in relation to the charge control set under the last LLCC, and similarly proposed under the 2015 LLCC Consultation, efficiency is a key metric in determining the cost base through the period of the control. To require Openreach to, on the one hand invest to ensure appropriate service, and on the other to become more efficient year on year (as a consequence of frontier shift and not on the basis of 'catch up' efficiencies), creates a tension that gives rise to the identified incentive to reduce costs. It is essential that this is accounted for in setting both QoS obligations and the charge control.

In that regard, we support Ofcom's proposal to focus on delivery rather than fault repair, as given that the evidence does not support intervention in relation to the latter issue, it would be inappropriate to seek to regulate across the board.

In summary, we consider that:

- There is no new or more intrusive approach to regulation of QoS required. The approach should be confined to refining aspects of the existing regulatory remedies that are not delivering;
- Ofcom must take account of, and ensure consistency with the approach that it has taken to QoS in the Fixed Wholesale Access markets. Ofcom has proposed to align the proposed regulation, in part, with the approach taken in the recent FAMR, for example, the approach in relation to contract negotiation principles for SLA and SLGs. Virgin Media considers that this approach is appropriate in both assuring consistency and also devolving the working level application of the requirement to industry in conjunction with OTA2;
- Recent regulatory remedies imposed by Ofcom in the Fixed Access Market Review place external targets and sanctions on BT to encourage it to improve QoS. It would be inappropriate to introduce further, more intrusive measures (even if that was to be in a different market) until those remedies have had time to take effect and Ofcom has had the opportunity to assess their effectiveness; and
- BT should be permitted to recover its reasonable costs of meeting improved service levels. Stripping value out of products for BT by limiting cost recovery for QoS parameters will have a wash-over effect for other, competing infrastructure investors.

[87] 2015 BCMR, paragraph 13.58

Section 14 – Remedies – Hull Area

Question 14.1: Do you agree with the remedies that we propose for KCOM in the retail TI and AI markets? If not, what alternative remedies would you propose and why?

Question 14.2: Do you agree with the remedies that we propose for KCOM in the wholesale TISBO and CISBO markets? If not, what alternative remedies would you propose and why?

Virgin Media has no comments to make at this time.

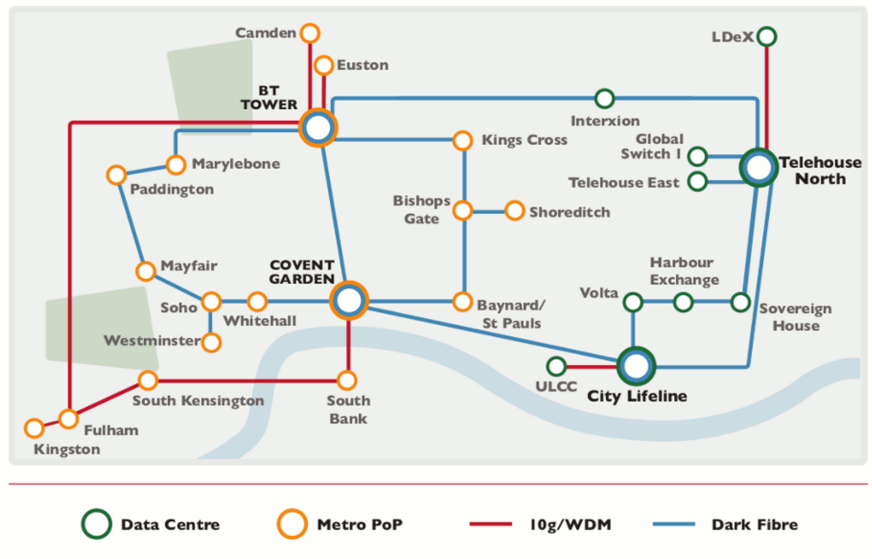
ANNEX 1

Summary of Alternative Network Operators in the Dark Fibre / High Bandwidth Market

Venus

Venus operates a dark fibre ring in central London. The dark fibre network appears to be largely in the CLA (although given the non-contiguous nature of the CLA it is not entirely clear). The 10Gbit/s/WDM network is within both the CLA and the LP.

Figure 1: Venus Dark Fibre Network



Source: Venus (http://www.venus.co.uk/go/fibre-network/dark-fibre-ring).

Zayo

Zayo (formerly GeoFibre) operates a dark fibre network. Its network appears to span the CLA and the LP, with some availability outside London.

Figure 2: Zayo's Dark Fibre Network map in the City of London

Source: City of Westminster, Environment Policy and Scrutiny Committee, page 20.
Note: The dark fibres are the blue lines.

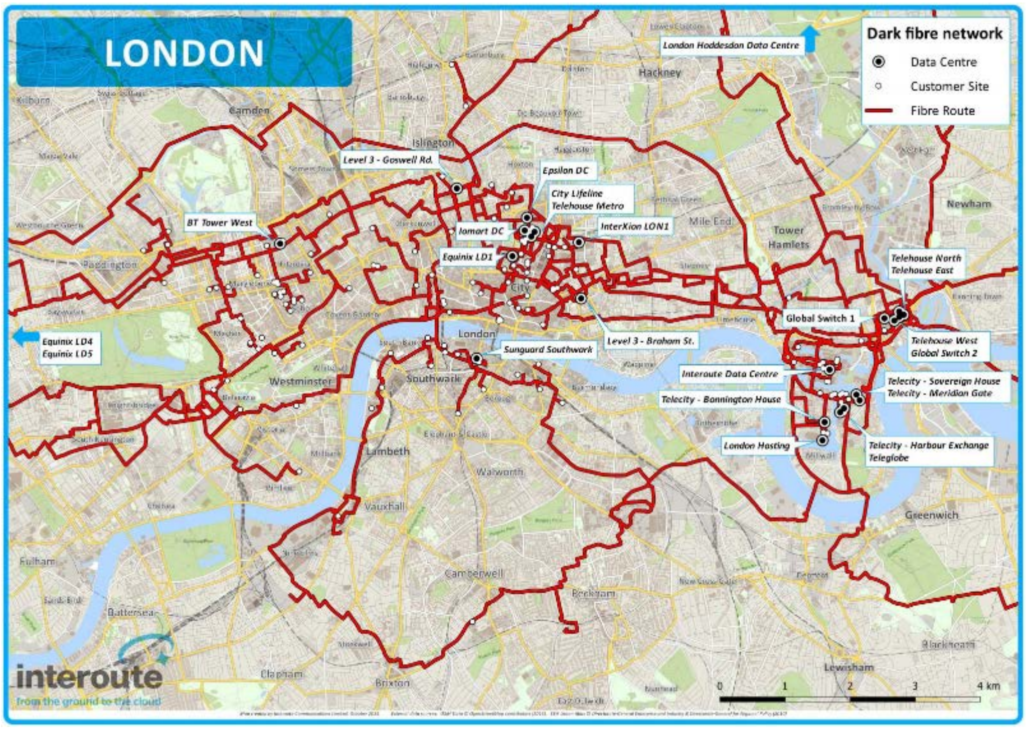
Figure 3: Zayo's Data Centre Connectivity map in London as of 30 January 2014

Source: Zayo's website (http://www.zayo.com/network/uk-network/london-dark-fibre/data-centre-connectivity).
Note: The Data Centre Connectivity is connected via Dark Fibre.

Interoute

Interoute operates a dark fibre network both in the CLA and in the LP.

Figure 4: Interoute's Dark Fibre Network map in London

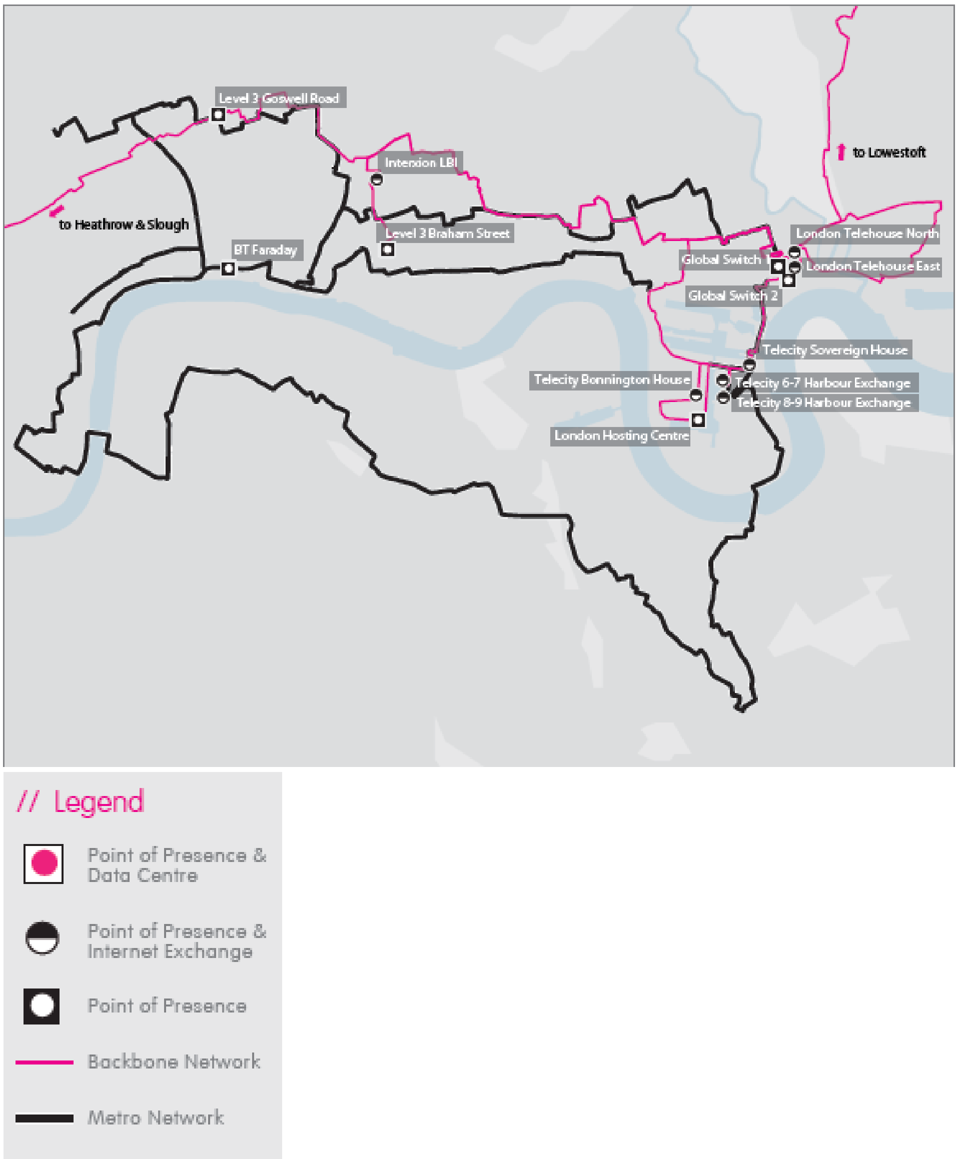


Source: Interoute website (http://www.interoute.com/dark-fibre-london).

Viatel

Viatel also operates a dark fibre network in London. This appears to sit within the CLA and the LP.

Figure 5: Viatel's Dark Fibre Network map in the City of London

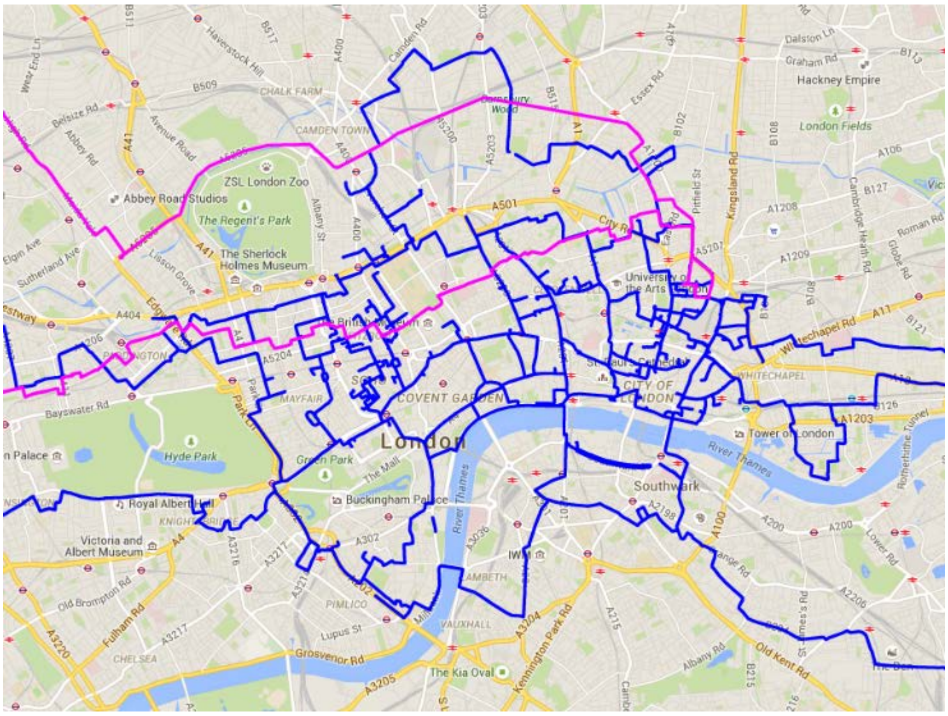


Source: Viatel, Dark Fibre maps in Europe, page 9.

EuNetworks

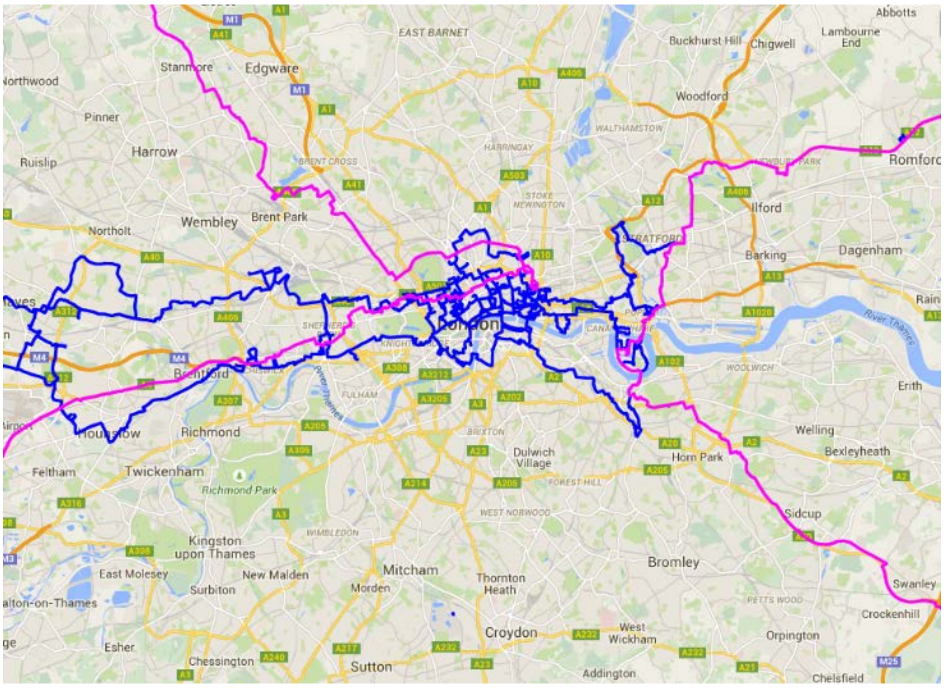
EuNetworks offers alternative infrastructure in London and the surrounding areas.

Figure 6: EuNetworks's Network map in Central London



Source: EuNetworks website (http://www.eunetworks.com/location-finder/).

Figure 7: EuNetworks's Network map in London



Source: EuNetworks website (http://www.eunetworks.com/location-finder/).

Figure 8: EuNetworks's Network map in the UK

Source: EuNetworks website (http://www.eunetworks.com/location-finder/).

ANNEX 2

Table 1: Regulation of Dark Fibre by other sampled EU NRAs

Country	Active Services	Duct Access	Dark Fibre
France			
Cost basis	Cost orientation < 10Mb/s. No excessive prices > 10MB/s	Commercially negotiate, unless for FTTH deployments	Commercially negotiated
Restrictions	-	Pre 2014 = Restricted to backhaul only (MDF-MDF or MDF-POP) After 2014 = Extended to entire network	Restricted for FTTH deployment
Germany			
Cost basis	Charge control for 2-10 MB/s Charge control for 10-155 MB/s	BU-LRIC	BU-LRIC
Geographic restrictions		Sub-Loop backhaul only	Only available when Duct Access not possible. If duct access is possible, but expensive, dark fibre is not available
Other comments		All FTTH deployments also regulated (including those by non-SMP firms)	All FTTH deployments also regulated (including those by non-SMP firms)
Spain			
Cost basis	Cost Orientation (PPCs) Retail Minus (Ethernet < 1Gb/s) Reasonable prices (Ethernet > 1Gb/s)	Cost orientated	Cost orientated
Restrictions	-	-	Only where duct access is unavailable
Portugal	*(Note: Portuguese regulations are subject to on-going review)*		
Cost basis	Cost orientation for PPCs Retail minus for Ethernet	Cost orientated (FL-LRIC envisaged)	Commercially negotiated
Restrictions	Some areas deemed competitive	Portugal Telecom has an RO Other operators (non-SMP) have to offer access (but no RO)	Only where duct access not possible
Austria			
Cost basis	Price Cap for Ethernet	Retail minus, and price ceiling (based on FL-LRAIC)	Cost Orientated-
Restrictions	Some areas deemed competitive	-	Some areas deemed competitive

ANNEX 3

Impact analysis details

Virgin Media has undertaken an estimate of the impact of the proposed dark fibre remedy in conjunction with the work undertaken by other members of the IIG. Details of the methodology applied can be found in the joint IIG submission. In this section, we present further information on the inputs used in our own assessment to identify the specific estimated impact on Virgin Media, and the basis of these estimates.

[✂]