

Annex to the BT response to Ofcom's consultation on promoting competition and investment in fibre networks – Wholesale Fixed Telecoms Market Review 2021-26

29 May 2020

Non - confidential version

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A1. Compass Lexecon: review of Ofcom's approach to assessing ultrafast market power

A1.1 See independent report provided separately prepared by Compass Lexecon dated 22 April 2020.

A2. Altnet ultrafast deployments and investment funding

A2.1. In addition to Virgin Media, a large number of other operators have significant rollout plans for ultrafast networks as set out in Table A2.1 below.

Table A2.1: UK-based alternative networks' ultrafast deployments

Operator	Current coverage	Planned coverage (premises)	Planned coverage (percentage of UK premises)	Notes
Virgin Media	16,189,000	~25,000,000	~80%	Expansion strategy confirmed February 2020
CityFibre	298,000	8,000,000	27%	Construction underway in 16 towns and cities with rollout to 62 towns and cities announced
Hyperoptic	400,000	5,000,000	17%	Live in 43 towns and cities with plans to reach 2 million homes by 2021 and 5 million by 2024
Gigaclear	119,000	500,000	2%	Focused particularly on rural areas
Kcom	199,000	[Extent of planned expansion not public]	1%	Has completed full fibre in existing network and now expanding in East Yorkshire
Jurassic Fibre	0	300,000	1%	Focused on southwest England
Other	400,000	350,000	11%	This is the amount for others as reported in the WFTMR minus Kcom which we have reported separately.

Source: Operator websites and WFTMR 2020, Table A7.1.

A2.2 In addition to Table A2.1 the following table lists the investment groups funding altnet fibre operators in the UK. Table A2.2 brings into sharp relief the favourable funding environment for new entrants, with investment in excess of £2 billion since 1 January 2018.

Table A2.2: UK-based alternative networks provider deals since 2018

Target	Buyer/Investor	Date announced	Gross Transaction Value (USD)
City Fibre Infrastructure Holdings Ltd	Goldman Sachs Group Merchant Banking Division, Antin Infrastructure Partners SAS, Antin Infrastructure Partners UK Ltd, West Street European infrastructure Partners III LP and Broad Street Principal Investments UK Ltd	04/24/18	738
Talk Talk Group Fibre Nation	City Fibre Infrastructure Holdings Ltd	Jan-20	£200m
KCom Group PLC	Macquarie European Infrastructure Fund and Macquarie Infrastructure and Real Assets (Europe Ltd)	06/03/2019	736
Gigaclear	Infracapital	03/09/2019	124.1
Toob Ltd	Amber infrastructure Ltd	03/24/19	75
G. Network Communications Ltd	Cube infrastructure Managers SA	11/04/2018	60
County Broadband Ltd	Aviva Investors Global Services Ltd	06/30/18	46
Call Flow Solutions	NA	06/05/2019	26.6
Next Gen Access Ltd	International Public Partnerships Ltd, Amber Infrastructure Ltd. And Amber Fund Management Ltd	10/26/18	22
Quickline Communications Ltd	Bigblue Broadband PLC	08/05/2019	8
Urban Wimax Ltd	Foresight Group LLP	04/25/18	3
Trench Networks	European Regional Development Fund and Mercia Fund Managers	01/16/19	0.3
Urban Wimax Ltd	Foresight Group LLP	04/25/18	3
Trench Networks	European Regional Development Fund and Mercia Fund Managers	01/16/19	0.3
Hyperoptic	KKR & Co. Inc (NYSE:KKR)	10/14/19	£10-£30m
Voneus Ltd	Received initial commitment of £10m and may receive up to £30m in phases	08/05/2019	NA

Notes: Data compiled from 18 October 2019. Analysis includes acquisitions or investments in select UK based alternative carriers since 1 January 2018 with available transactions values in US\$ except where otherwise stated. Gross transactions value includes sum of total consideration to shareholders, total other consideration, total earnout/contingent payments, total rights /warrants/options, net assumed liabilities, adjustment size cash and short terms investments.

Source: S&P Global Market Intelligence

A2.3 The network investment that is underway is supported by the effectiveness of Physical Infrastructure Access (PIA) which has reduced the cost and time for entry and levelled the playing field with respect to Openreach in the deployment of ultrafast networks. Annex 7 of the WFTMR documents the significant role PIA plays in the extensive network rollouts underway.

A3. Examples of increasing price pressure in business tendering markets¹

- A3.1 Table A3.1 below provides examples of bids won by rival competitors to BT Enterprise that do not rely primarily on Openreach inputs. Indeed, many bids were won by alternative network providers using their own infrastructure, such as CityFibre and Virgin Media. It suggests that BT Enterprise lost these tenders overwhelmingly because it was not able to compete using Openreach inputs.
- A3.2 BT Enterprise has struggled in particular to match Virgin Media's price levels. Restricting Openreach's flexibility to respond to competition from established providers results in regulation that hands an advantage to competitors as opposed to fostering efficient infrastructure competition. As set out in chapter 4 of our Main Response this is likely to be to the disadvantage of consumers who could see less investment and higher prices.
- A3.3 However, competitors are not limited to large scale providers like Virgin Media: new entrants like CityFibre, in partnership with MLL Telecom, have also won contracts by deploying dark fibre networks in urban areas at low cost. Many providers will use a mix of infrastructure. For example, for a large bid spanning urban and rural areas (many public sector bids that we discuss below encompass a mixture of urban and rural areas) a provider may use Openreach's input for rural areas (that may fall into Area 3) but deploy its own network (or use an alternative network or dark fibre provider) in more densely populated urban areas (typically Area 2 or HNR). This allows them to benefit from regulated access to Openreach's network at regulated national prices in the harder to reach (and therefore more expensive to serve) areas while maintaining a cost advantage in urban areas that are typically cheaper to serve.
- A3.4 Ofcom's proposal to limit Openreach's ability to offer geographically differentiated prices will engrain this situation, rather than allowing competition on the merits to play out, in a context where all suppliers tend to differentiate price by geography, depending on cost and demand. Already today, [X].
- A3.5 The contracts included in the list below fall mainly into three categories:²

- [X]

Table A3.1 – Examples of contracts BT Enterprise has lost to alternative network providers

[X]

¹ This chapter of the Annex has been submitted on 12 June 2020.

² Please note that Table A3.1 also includes contracts that BT had already provided to Ofcom in response to its consultation on its approach to remedies: BT's response to Ofcom's consultation on its approach remedies, Annex 1, submitted 14 June 2019.

A4. Market analysis and remedies related to physical infrastructure

A4.1 Ofcom's approach draws heavily on its analysis in the Physical Infrastructure Market Review ('PIMR').³ We raised our concerns with Ofcom's analysis at the time in our consultation response and our view is largely unchanged since then.⁴

A4.2 Ofcom has still not made the legal or regulatory case for imposing DPA on Openreach across *all* fixed telecoms markets (business and residential) and across *all* geographic markets. We are concerned that this distorts its assessment of remedies in the PI market (see below and in chapter 6 of our Main Response) and in relation to markets further downstream (see chapters 2 and 4 of our Main Response).

A4.3 We consider that:

- Ofcom should promote access to PI more generally, including that of competing networks such as Virgin Media for example via the UK Access to Infrastructure Regulations (ATI Regulations)⁵, to better meet its objectives.
- It must also ensure its DPA remedy is appropriately targeted to the fixed telecoms market, not in markets where SMP has not been found (such as wireless broadband).
- The DPA remedy must be applied in a proportionate way to put our downstream businesses on a par with rivals in being able to use Openreach inputs flexibly and competitively where appropriate. For example, where effective use of Openreach DPA requires some limited build of new duct by BT Enterprise, we ask that Ofcom exempt such build from the SMP conditions (see Chapter 4 in our Main Response and Annex 8 below).
- Ofcom regulation of Openreach PI should be limited to use in the fixed telecoms markets consistent with Ofcom's market definition and SMP findings. Regulatory creep into competitive mobile markets must be avoided.
- Ofcom must recognise that partial or full network infrastructure self-build by competitors of Openreach exposes BT to volume risk in relation to PI cost recovery. This is exacerbated by a regulatory pricing regime which is based on a price per component (as a proxy for value) rather than being directly linked to, for example, the number of premises served. Given Ofcom has had to make assumptions about these uncertain parameters in order to set a forward-looking price, the proposed PIA pricing regime potentially risks costs and prices diverging over time. In these circumstances we consider it would be reasonable for Ofcom to explicitly acknowledge that if this risk crystallises it will review its pricing regime to ensure it continues to meet its regulatory objectives

A4.4 In the following we set out our view on Ofcom's product market definition; geographic market definition; and SMP analysis (addressing Ofcom's questions in Chapters 3 to 5 of WFTMR 2020 Volume 2). It then provides our view on Ofcom's proposed remedies (addressing Ofcom's questions in Chapter 4 of WFTMR 2020 Volume 3).

³ Ofcom, 28 June 2019. [Promoting competition and investment in fibre networks: review of the physical infrastructure and business connectivity markets.](#)

⁴ BT, 18 January 2019, [Response to Ofcom's consultations on the Physical Infrastructure and the Business Connectivity Market Reviews](#)

⁵ [The Communications \(Access to Infrastructure\) Regulations 2016](#)

Our assessment of Ofcom's market analysis

PI – product market definition

Question 3.1: Do you agree with our provisional conclusion on physical infrastructure product market definition? Please set out your reasons and supporting evidence for your response.

- A4.5 Ofcom proposes to define the product market as the supply of wholesale access to telecoms PI for deploying a telecoms network.⁶ Ofcom's proposed product market definition broadly aligns with the definition it adopted in its PIMR Statement. We and Openreach commented on the proposed market definition in our response to Ofcom's consultation on the PIMR in 2018 and we still support the points made in these submissions.^{7 8}
- A4.6 In the WFTMR 2020 Ofcom identifies separate wholesale markets for wholesale local access (WLA) and leased line access (LLA) (which we agree with as set out in chapter 2 of our Main Response), but these findings are not reflected back into the PI market which sits upstream of these. This is contrary to the market definition guidelines which indicate that the starting point for upstream market definition should be the analysis of 'corresponding' retail markets.⁹
- A4.7 Our Main Response argues that Ofcom should reconsider its market power finding as Openreach does not have market power in ultrafast, or in certain areas for business circuits, when the competitive retail and wholesale dynamics characterising markets today are properly considered. If Ofcom were to reflect these dynamics in its market analysis, it is likely that Ofcom would find significantly larger areas of the UK to be effectively competitive already, and therefore no or very weak grounds for requiring wholesale access to BTs PI in these areas.
- A4.8 In addition, as we and Openreach set out in our responses to Ofcom's PIMR consultation we consider that non-telecoms PI may be viable for use in network deployment in more than isolated cases. By not recognising this, Ofcom has understated the role that others' infrastructure can play and therefore the extent of supply-side substitution.
- A4.9 The PIMR Statement indicated (wrongly) that using non-telecoms PI is generally costlier and involves higher operational complexity, relative to telecoms PI, making it materially less attractive to access seekers.
- A4.10 However, as noted in the Openreach response to the PIMR consultation, there is significant evidence that non-telecoms PI is used in the provision of telecoms services.¹⁰ This pointed to evidence contained in the Future Telecoms Infrastructure Review (FTIR),

⁶ WFTMR 2020, Volume 2, paragraph 3.2.

⁷ BT, 18 January 2019. [Response to Ofcom's consultations on the Physical Infrastructure and the Business Connectivity Market Reviews](#)

⁸ Openreach, 1 February 2019. [Openreach's response to Ofcom's consultation "Physical Infrastructure Market Review – Access to ducts and poles to support investment"](#).

⁹ "The starting point for the identification of wholesale markets susceptible for ex ante regulation should always be the analysis of corresponding retail market(s)." See European Commission, 11 July 2002. [Guidelines on market analysis and the assessment of significant market power under the EU regulatory framework for electronic communications networks and services](#) (2018/C 159/01).

¹⁰ Openreach, 1 February 2019. [Openreach's response to Ofcom's consultation "Physical Infrastructure Market Review – Access to ducts and poles to support investment"](#).

which noted the many examples of commercially-led infrastructure sharing which have emerged across the country, both within the telecoms industry and also within other utility sectors.¹¹

A4.11 An Analysys Mason report (submitted with Openreach's response) provides UK and international examples where low-voltage electricity infrastructure is being used successfully for FTTP deployment, such as the SIRO joint venture in the Republic of Ireland between Vodafone and ESB, the electricity utility company.¹² The report concludes that Ofcom too readily dismissed non-telco infrastructure by failing to take a sufficiently nuanced approach in considering the differing types of non-telecoms infrastructure and considering separately the suitability of these for access and backhaul.

A4.12 There is further evidence of non-telecoms infrastructure being used to deploy fibre networks. For example, the Analysys Mason report referenced SSE Telecom's planned use of the London sewer network in 2018.¹³ SSE Telecoms is now working with a number of water companies to speed up fibre deployment in wastewater infrastructure.¹⁴ SSE says that using this infrastructure allows them to reduce costs and deploy connectivity services up to ten times faster than through traditional digs.¹⁵

A4.13 Since the PIMR Statement, Ofcom has not, apparently, revisited its analysis other than through discussions with stakeholders.¹⁶ Ofcom's market definition exercise (and SMP assessment) could therefore over-estimate the importance of BT PI to Openreach's competitors and under-estimate the potential viability of non-telecoms infrastructure in building telecoms networks.

A4.14 In light of this, and the evidence we provided previously, which is still relevant and applicable, we consider that Ofcom has not made the case that non-telecoms infrastructure does not form part of the relevant market.

PI – geographic market definition

Question 4.1: Do you agree with our provisional conclusion on physical infrastructure geographic market definition? Please set out your reasons and supporting evidence for your response.

A4.15 Ofcom considers that the geographic areas of the UK can be broadly categorised as those where:

- BT's infrastructure passes virtually every premise and there is limited alternative telecoms infrastructure ('**Category A**').
- Alternative telecoms infrastructure has been deployed to support MSNs (at present, Virgin Media is the only significant operator with such infrastructure) ('**Category B**').
- A high presence of alternative telecoms infrastructure has been deployed to supply leased lines ('**Category C**').

¹¹ DCMS, 23 July 2018. [Future Telecoms Infrastructure Review](#), paragraph 77.

¹² Analysys Mason, 30 January 2019. [Commentary on Ofcom's PIMR consultation document](#).

¹³ SSE, 28 September 2018, [SSE Enterprise Telecoms, Three UK and Telefónica UK \(O2\) have agreed to support further fibre rollout in London](#).

¹⁴ SSE, 3 March 2020. [Smarter sewers: Technical User Group \(TUG\) launched to develop standards for fibre deployment in the wastewater network](#).

¹⁵ SSE, 20 January 2020. [How creating London's future is uncovering its past](#).

¹⁶ WFTMR 2020, Volume 2, paragraph 3.17.

- Significantly more alternative telecoms infrastructure has been deployed to supply leased lines than in Category C above ('Category D').¹⁷

A4.16 Despite the differences in competitive conditions Ofcom proposes to find a single national market for PI in the WFTMR 2020.¹⁸

A4.17 Ofcom attempts to justify extending the geographic market from area A to areas B, C and D by stating that "*a ubiquitous infrastructure is likely to have material advantages over non-ubiquitous infrastructure for access seekers, wherever they seek to deploy.*"¹⁹ We do not agree for a number of reasons:

- The business models of rival networks (e.g. Virgin Media and many operators in leased lines markets) demonstrate that ubiquity is not a necessary condition for entry and successful operation. Operators do not necessarily need to deploy at scale in an area (or across several of them) and therefore do *not* require ubiquitous infrastructure²⁰.
- Virgin Media's existing (and planned) network puts effective competitive pressure on BT as set out in Chapter 2 of our Main Response and its network can already be used by third party providers under the ATI Regulations.
- Ofcom understate²¹ the extent to which altnets can 'mix and match' PI from other providers with continued self-build of PI (as evidenced in the Analysys Mason reports). Again, this suggests access to one single ubiquitous PI infrastructure is not necessary for a telecoms provider to compete sustainably in the WLA or LLA markets.

A4.18 Furthermore, Ofcom asserts that BT does not face an effective constraint in the Category B area, because "*BT's lead-in infrastructure is likely to offer cost and capacity advantages in terms of connecting premises.*"²² The Analysys Mason report found no evidence of material differences in connection costs per premise between Openreach and Virgin Media, nor that any such difference (if it exists) is material relative to the value at stake.²³ Analysys Mason also found that Virgin Media's lead-in lengths are considerably shorter than Openreach's.

A4.19 In summary, we consider that Ofcom has not demonstrated that a single national geographic market for PI exists. We consider that separate geographic markets exist, mirroring the geographic categories Ofcom itself has identified (as set out above) or at least mirroring the scope of the downstream (active) services markets Ofcom has defined in its analysis of the WLA and LLA markets.²⁴

Question 4.2: Do you agree with our provisional conclusion on the application of the three criteria test to the physical infrastructure market? Please set out your reasons and supporting evidence for your response.

¹⁷ WFTMR 2020, Volume 2, paragraph 4.3.

¹⁸ WFTMR 2020, Volume 2, paragraph 4.1.

¹⁹ WFTMR 2020, Volume 2, paragraph 4.15.

²⁰ Analysys Mason, 30 January 2019. [Commentary on Ofcom's PIMR consultation document](#), page 22.

²¹ WFTMR 2020, Volume 2, paragraph 4.22 which states, "in general, such usage of self-build and mix-and-match is based on necessity, rather than preference, and so would not constrain the behaviour of owners of ubiquitous infrastructure."

²² WFTMR 2020, Volume 2, paragraph 4.25.

²³ Analysys Mason, 30 January 2019. [Commentary on Ofcom's PIMR consultation document](#), page 16.

²⁴ European Commission, 9 October 2014. [Commission Recommendation on relevant product and service markets within the electronic communications sector susceptible to ex ante regulation in accordance with Directive 2002/21/EC. 'EC Recommendation on Relevant Markets'](#).

A4.20 The EC Recommendation on Relevant Markets sets out three criteria which must be satisfied if NRAs wish to regulate and identify markets that differ from those identified in the EC Recommendation:

- The presence of high and non-transitory structural, legal or regulatory barriers to entry.
- A market structure which does not tend towards effective competition within the relevant time horizon, having regard to the state of infrastructure-based and other competition behind the barriers to entry.
- Competition law alone is insufficient to adequately address the identified market failure(s).

A4.21 We disagree with the conclusion that Ofcom has drawn and its application of the three-criteria-test. In particular, as set out in chapter 2 of our Main Response, where markets are effectively competitive already downstream of DPA, we do not consider the three-criteria test is likely to be met.

PI – SMP analysis

Question 5.1: Do you agree with our provisional finding on SMP and resultant competition concerns in the physical infrastructure market? Please set out your reasons and supporting evidence for your response.

A4.22 Ofcom proposes that, absent *ex ante* regulation, BT would have SMP in their proposed national geographic market for the supply of wholesale access to telecoms PI for deploying a telecoms network.²⁵

A4.23 We consider that Ofcom has over-stated BT's market power in PI - and in particular where downstream competition is effective - for the following reasons:

- Ofcom has not started from an appropriate analysis of retail markets. Had it done so then it would have recognised that where a supplier faces competition in downstream markets already from end-to-end suppliers, its control over any upstream inputs cannot be a source of market power. This puts in doubt whether Ofcom's proposed remedies in the upstream market are necessary, appropriately targeted and proportionate. In this context, we consider that Ofcom has underestimated the strength of competition from other existing telecoms networks as we set out in chapter 2 of our Main Response.
- Ofcom has underestimated the scope for using non-telecoms infrastructure (as described above in the section on product market definition) and may have missed developments (for example cases where telecoms providers are self-building or combining self-building with use of telecoms and non-telecoms PI).²⁶

²⁵ WFTMR 2020, Volume 2, paragraph 5.5.

²⁶ BT is unable to tell how its rivals deploy network by self-building, using non-telecoms infrastructure or Openreach DPA unless the information is in the public domain. However, Ofcom has the powers to request such information and a duty to take this into account in its findings.

- Ofcom has not sufficiently considered the impact of other regulation. EC Guidance²⁷ (confirmed by the CAT in its 2017 BCMR judgment)²⁸ indicates that an SMP assessment must take account of all specific telecommunications regulation which is in place over the relevant period. However, Ofcom has not taken due account of the ATI Regulations which have the potential to enable access to alternative PI, because (as described above) we consider that non-telecoms PI may be viable for use in network deployment in more than isolated cases with access potentially facilitated by the ATI Regulations.
- Ofcom has not recognised that, in many situations, Openreach has no competitive advantage compared to rival networks (for example in the case of new build developments) and in some cases Openreach is at a competitive disadvantage for example where a property developer agrees exclusivity with one connectivity provider.²⁹

A4.24 In particular in the areas in the LLA market that are in our view already effectively competitive, i.e. the Central London Area ('CLA'), the High Network Reach Areas ('HNRs') and potentially all of Area 2, SMP finding on PI is not justified. The implications for remedies (in the PI market and markets further downstream) are set out next.

Our assessment of Ofcom's remedies

Question 4.1: Do you agree with our proposed specific PIA remedies? Please set out your reasons and supporting evidence for your response.

Ofcom has insufficiently considered the proportionality of its package of proposed remedies across the fixed telecoms supply chain

A4.25 Ofcom has not sufficiently considered its package of remedies across the PI and downstream markets. This appears to stem from its cursory analysis of the PI market (as we set out above), which does not follow the market definitions Ofcom has found in markets further downstream. This results in market power findings in PI markets which are not supported by the evidence and the imposition of DPA at cost where it is not necessary or justified to address the competition issues identified in downstream markets. The resulting layering of remedies is unnecessary and disproportionate, potentially harming competition and consumers.

A4.26 For example, in the areas in the LLA market that are in our view already effectively competitive, i.e. the Central London Area ('CLA'), the High Network Reach Areas ('HNRs') and potentially all of Area 2 (see chapter 2 of our Main Response), Ofcom's proposed SMP finding for BT PI is not justified and PI access remedies should not be applied. Should Ofcom nevertheless persist in its SMP finding in the PI market in these geographic LLA markets, Ofcom must reconsider the proportionality of imposing additional downstream remedies on Openreach including in particular ex ante restrictions on its ability to compete in the LLA market in the HNRs and in Area 2. Poorly

²⁷ European Commission, 2002 [Guidelines on market analysis and the assessment of significant market power under the EU regulatory framework for electronic communications networks and services](#), paragraph 17 and reiterated in European Commission, 2018 [Guidelines on market analysis and the assessment of significant market power under the EU regulatory framework for electronic communications networks and services](#), paragraph 13

²⁸ Competition Appeal Tribunal, [Judgement \(Market Definition\)](#) in BT vs. Ofcom and Virgin Media, 1260/3/3/16, 10 November 2017.

²⁹ This is set out in greater detail in Openreach's response to the WFTMR 2020.

targeted and disproportionate remedies are more likely to harm than benefit competition (on the merits), investment and importantly consumers.

A4.27 It is even more important in this context that the regulatory framework does not prevent BTs downstream arms from being able to compete on a level playing field with other CPs using Openreach DPA (and dark fibre as the case may be) without SMP conditions applying to the products thus created. As we set out in Chapter 4 of our Main Response and in Annex 8 below, it is not necessary or proportionate (to protect competition or consumers) that Ofcom applies SMP conditions to new duct created by BT Enterprise where this is necessary for it to compete on a level playing field with other CPs in LLA markets. As noted above, BT Enterprise competitors are combining PI inputs from different owners of PI (including non-telecoms infrastructure, self-build and Openreach DPA) and BT Enterprise should be free to do the same without restrictions beyond those implied by ex post competition law.

Ofcom should improve access to rival networks' PI, rather than focusing solely on BT

A4.28 Ofcom's proposed access conditions in the PI market apply only to BT. We consider that competitive investment in full fibre networks would have the best chance of success if access is facilitated more generally. Due to its exclusive focus on BT PI Ofcom's proposals appear to fall short of the Government's strategy for the sector. The Government has made clear that it would like to see any barriers to the use of non-telecoms infrastructure addressed.³⁰

A4.29 Therefore, Ofcom should consider how best to improve access to PI more generally, i.e. by rival networks as well as by Openreach, to better promote competition and investment. This includes, but is not necessarily limited to, Ofcom placing greater emphasis on ensuring the ATI Regulations are implemented in a way that is fit for purpose.

A4.30 While we agree that in some circumstances BT's infrastructure will be preferable to rival networks, in many other cases this will not be the case. For example, the evidence provided in the Analysys Mason report indicates that Virgin Media's PI is suitable for fibre deployment. It is very likely that rival networks (and indeed Openreach) would value access to this infrastructure to reduce costs of full fibre deployment and support plans for bringing ultrafast services to customers quickly and widely in the years to come. Access to Virgin Media's PI would be particularly beneficial in areas where BT's PI is not usable by third parties or where BT does not have existing PI.

A4.31 Virgin Media's narrower footprint is not an obstacle for third party use as ubiquity is not a pre-requisite for competitive investment in fibre infrastructure. As the evidence above, and in chapter 2 of our Main Response suggests, PI owned by non-telecoms infrastructure providers and third party telecoms infrastructure providers can be combined to support fibre deployment (and the Government has made clear that it wants any barriers to be addressed).³¹

³⁰ DCMS, 29 October 2019. Statement of Strategic Priorities for telecommunications, the management of radio spectrum, and postal services, paragraph 17.

³¹ Ofcom is able to and should verify using its formal powers to request information, [Communications Act 2003](#), section 3.

Ofcom should ensure its remedies are clearly focused on fixed telecoms

A4.32 Ofcom's draft legal instruments define the "Telecoms Physical Infrastructure" to which the SMP condition relates as the "Physical Infrastructure that was deployed for the purposes of deploying a fixed telecommunications network".³² However, the legal instrument does not explicitly limit the definition of "Physical Infrastructure Access" solely to a fixed telecoms network.³³

A4.33 As also set out in Openreach's response to the WFTMR 2020, the legal instrument as it stands could potentially lead to an interpretation by CPs that access conditions applying to Openreach DPA could be used to deploy mobile equipment to provide mobile or fixed wireless services which fall outside the relevant markets defined by Ofcom.³⁴ In these circumstances, inputs would be provided into markets where Ofcom has not identified any competition concerns. Providers of wireless connectivity have numerous alternatives to BT poles for hosting equipment on dedicated masts e.g. mobile cell site masts, municipal street furniture (e.g. lamp posts, bus stops, external walls and roof-tops), or buildings.

A4.34 We raised this issue previously in response to Ofcom's PIMR. However, Ofcom considered at that time that the DPA should have no usage restrictions. Ofcom responded to our concerns and stated *"BT's physical infrastructure is not currently being used for radio equipment, such use is not anticipated over the review period and it is unclear to us whether it would even be possible in practice, we do not consider that it is necessary to impose a usage restriction on the PIA remedy to exclude the use of BT's physical infrastructure for hosting radio equipment, in particular given the risk of regulatory failure associated with imposing such a restriction."*³⁵

A4.35 However, [X]. Therefore, Ofcom's key rationale for not including usage restrictions is no longer applicable. We are concerned that given the long time frame of the coming market review period – which coincides with expected innovation in and deployment of 5G and small cells (including in the PI used or built to support them) - it is essential that Ofcom should clarify the situation to avoid protracted and unnecessary disputes.

A4.36 Ofcom should therefore i) clarify that its objective is to address potential competition concerns in the fixed telecoms market only, and ii) confirm that access to BT's PI is not in scope where it could be used to host radio transmission or reception equipment to provide wireless services.

Ofcom should recognise the cost recovery risks of its proposed pricing regime for DPA and commit to addressing them should they materialise

A4.37 Ofcom proposes to find BT to have SMP in a national market for PI on the basis that PI belonging to utilities, and other telecommunication providers (including Virgin Media

³² WFTMR 2020, Volume 5, page 8.

³³ WFTMR 2020, Volume 5, page 20.

³⁴ WFTMR 2020, Volume 2, paragraph 6.66.

³⁵ Ofcom, 28 June 2019. [Promoting competition and investment in fibre networks: review of the physical infrastructure and business connectivity markets](#). Volume 1, paragraph 5.34.

and leased line-only providers) would not place an effective supply-side constraint on BT given the 'ubiquity' of BT PI.

A4.38 Ofcom has effectively concluded that BT's investment in PI (which BT has sustained over very many years), has created an asset which is of unique importance and value to the deployment of ultrafast networks nationally. This is based on a view that competing ultrafast-capable networks can be more efficiently deployed by sharing access to BT's existing PI, with its costs being shared between all network builders on an ongoing basis.

A4.39 But as also set out in chapter 6 of our Main Response, BT PI can, and is, being bypassed wholly or on a selective basis by builders of ultrafast-capable networks. Firstly, other network builders may use DPA selectively, combining its use with self-build (or non-telecoms infrastructure) depending on their network topology and the cost of DPA as compared to these alternatives. Secondly, they may not use DPA at all in some areas and fully bypass BT PI.

A4.40 Ofcom's proposed pricing regime for DPA is based on a price per component (for example a metre of duct or a pole attachment). Although (as we set out in chapter 6 of our Main Response) Ofcom says it calibrates these prices by reference to the value the users of our PI are likely to generate from their use of DPA, cost recovery of our PI asset cost depends on future take-up of the service. Selective usage (or bypass) of BT's PI risks leaving BT to incur the costs of the expensive PI in those instances without Ofcom pricing being adjusted accordingly (as it is based on a per component proxy of the value it helps generate further downstream). To the extent that selective use would imply that network builders focus on own build where it's cheaper than using the Openreach DPA products this could cause a spiral putting cost recovery materially at risk.

A4.41 Ofcom has had to make assumptions about these very uncertain usage parameters in order to set a forward-looking price. On that basis, the proposed PIA regime potentially risks costs and prices diverging over time. We consider it would be reasonable for Ofcom to explicitly acknowledge that, if this risk crystallises over time, it will review its pricing regime to ensure it continues to meet its regulatory objectives.

A5. Risks borne by investors in BT's fibre investment

A5.1 This annex provides a description of the risks in our fibre investment case. These can be categorised as specific or systematic risks:

- **Specific risk** drives the distribution of cashflow (and return) outcomes for the project
- **Systematic risk** relates to the covariance of project returns with the market more generally, as captured by the 'beta' of the project

A5.2 These are, in principle, distinct and independent sources of risk, but care is needed to avoid double counting. Ofcom recognised these categories of risk and the importance of capturing them at project outset when it assessed the fair bet for FTTC.³⁶

Specific risk

A5.3 Turning first to specific risk, investment outcomes vary depending on uncertain demand, cost and technology factors. Specifically, we address the following sources of risk:

- the migration of customers from BT's copper to fibre platform may take longer than expected
- fibre customers may not take up higher speed ultrafast products as expected, or their willingness to pay may be lower than expected
- communications providers may switch to rival networks after we have built a fibre network designed to serve them
- investment by BT in full fibre avoids volume losses to rival networks (against a counterfactual with less investment) but this value is inherently risky and uncertain
- the costs of fibre deployment are uncertain
- there are medium to longer term risks posed by rival technologies

³⁶ Ofcom stated "In considering the risk associated with BT's investment in fibre access, we need to distinguish between specific risk and systematic risk. Both would contribute to a higher overall risk for investment in fibre access, but we need to be careful to avoid double counting these risks. In identifying a benchmark cost of capital for investment appraisal, we are concerned with identifying systematic risk and not specific risk. Specific risk forms the basis of our wider assessment of the fair bet in this annex. Systematic risk is measured by the 'beta' of the project and in theory exists independently of specific risk. In practice, distinguishing between the two is not straightforward, but any estimate of a project-specific cost of capital should, in principle, only be concerned with systematic risk. As to when that assessment of systematic risk is made, we agree with Oxera that the relevant cost of capital to use in assessing the fair bet would be that associated with fibre access at the time of the original investment rather than the forward-looking cost of capital determined in this review." WLA 2018, Annex 6, paragraphs A6.74 to A6.76.

The migration of customers from BT's copper to fibre platform may take longer than expected

- A5.4 Although Ofcom's WFTMR proposals may facilitate this transition, we cannot force customers to migrate. To be clear, Government has not given Ofcom the task of discontinuing copper (with a mandate and switchover date) as it did for analogue television.
- A5.5 Copper migration will be managed by Openreach in consultation with its customers with some helpful levers provided by Ofcom (such as permission to stop selling copper once ultrafast has been deployed to 75% of an exchange area, and removing copper regulation in exchange areas when ultrafast coverage is complete allowing Openreach to use copper prices to encourage migration).
- A5.6 But, even allowing for these levers, there is uncertainty about the commercial and operational processes involved (which creates risk). Deals with CPs with terms which incentivise migration are uncertain and there could be a long tail of complex cases.³⁷
- A5.7 Ofcom argues that its levers will "*significantly reduce the risk that customers will not migrate to [Openreach's] fibre network*". We agree that risk is reduced but it is far from being removed.³⁸

Fibre customers may not take up higher speed ultrafast products as expected, or their willingness to pay may be lower than expected

- A5.8 Ofcom's own evidence points to a lack of demand for ultrafast speeds.³⁹ Ofcom expects "*a large proportion of customers to remain on standard broadband and 40/10Mbps throughout the review period*".⁴⁰ Ofcom also expects that the ability to charge higher prices for higher speed ultrafast products will be limited because 40/10Mbps is an adequate alternative and will be available at a regulated price.⁴¹
- A5.9 We agree that ultrafast demand is currently modest and will take many years to emerge (far beyond the next review period). So even if a timely migration to FTTP 40/10Mbps is achieved, there is a risk that customers will sit on this product (or lower entry-level products) rather than taking up higher value, higher speed products over time, because they will have a very adequate product for their foreseeable needs. And even if they do move up the speed tiers, the premium that is likely to be charged for these products will be modest.

³⁷ Ofcom's proposals in Annex 15 of the consultation would mean that any offer with a geographic dimension would require Openreach to seek consent from Ofcom. Even without a geographic dimension, Ofcom might use its regulatory powers to intervene unless it was convinced that such an arrangement offered clear and demonstrable benefits to customers.

³⁸ WFTMR 2020, Volume 4, paragraph 1.89.

³⁹ Ofcom states "Research undertaken by stakeholders suggests consumers do not have a high willingness to pay for speeds above 40/10 and that speed is not the most important factor in decisions to switch provider. Evidence, including pricing for ultrafast services on alternative networks, suggests that most consumers are not willing to pay a significant premium for ultrafast services." WFTMR 2020, Volume 4, paragraph 1.33.

⁴⁰ WFTMR 2020, Volume 4, paragraph 1.30.

⁴¹ WFTMR 2020, Volume 4, paragraph 1.32 to 1.33.

A5.10 Openreach already supplies an 80/20Mbps product, so the potential to earn extra revenue from higher speeds has to be from speeds above those already on offer (which is unlikely given that 40/10Mbps and 80/20Mbps are adequate for most customer's needs for very many years to come). The 80/20Mbps product is priced by Openreach at only a small premium to the 40/10Mbps product to encourage take-up and to compete effectively (as Ofcom accepts).⁴² Prices for higher bandwidths are, in turn, constrained.

A5.11 This creates demand risk which is not mitigated by Ofcom's regulatory proposals. In fact, Ofcom's decision to continue to price cap the 40/10Mbps wholesale product and mandate its availability on BT's full-fibre networks increases this risk by requiring the provision of a relatively low-price, but very reliable, regulated product which will 'anchor' demand for higher speed products for many years to come by acting as an effective substitute.

A5.12 Ofcom explains that this will protect customers from excessive pricing for higher speed products which it proposes not to price regulate. But this also points to a very limited opportunity for BT to achieve cost recovery and a reasonable return from new and higher performance products until demand strengthens in the (potentially far) future. [X]

A5.13 Ofcom argues that pricing flexibility will support investment (by allowing higher prices, as the 40/10Mbps constraint weakens), but not enough that it is worried about excessive pricing.⁴³ This highlights the risk for investors; demand will be weak for some time (given the attractiveness of 40/10Mbps), but when the constraint weakens (allowing operators to lift higher speed prices) Ofcom may step in to avoid prices becoming excessive (without clarity – as things stand - on what risks it would recognise before doing so).

A5.14 This is very different from the approach taken by regulators in fibre-rich countries like Spain and Portugal where wholesale regulation of full fibre was largely absent in order to give operators maximum flexibility to monetise their investment (and manage their risks) in the early years.⁴⁴

A5.15 Put simply, the pricing flexibility for higher speed ultrafast products proposed by Ofcom does not help Openreach in the face of initial weak demand (which is what Ofcom is forecasting); and the requirement to provide a very adequate 'anchor' product increases demand risk substantially. This is borne by investors and is much more acute for FTTP than it was for FTTC, given the extent to which BT (and others) are investing ahead of demand.

Communications providers may switch to rival networks after we have built a fibre network designed to serve them

A5.16 Ofcom rightly points out that the threat of competition creates an incentive for Openreach to invest in high speed networks. But if Openreach builds a network for

⁴² WFTMR 2020, Volume 4, paragraph 1.33(a) "Openreach has incentivised provider-led upgrades by setting very low incremental wholesale prices for higher bandwidth products. This is consistent with the 40/10Mbps providing a strong anchor constraint on higher bandwidth prices."

⁴³ WFTMR 2020, Volume 4, paragraph 1.19.

⁴⁴ WIK, 28 February 2019. [Prospective competition and deregulation: An analysis of European approaches to regulating full fibre](#). See section III entitled "Countries where fibre investment progressed at pace applied complete forbearance nationally on ultrafast access regulation in the initial period."

customers (to avoid losses) but they subsequently switch large volumes to rivals after the early years of rapid build (creating an under-utilised asset after costs have been sunk), then Openreach may earn insufficient returns relative to the cost of capital. This is a risk borne by investors.

A5.17 Typically, investors would proceed if they thought it likely the investment would (and could)⁴⁵ compete successfully, with the possibility of sufficient rewards to compensate for the downside risk of building an under-utilised asset. But in the case of Openreach, competing successfully brings the risk of a regulatory cap on returns. In other words, the distribution of potential returns that Openreach can achieve is asymmetric as it is capped on the upside at a level that currently remains unspecified.

A5.18 Any such cap must, therefore, take into account the risk (at the outset) of competition causing a large sunk fibre asset to be under-utilised.

Investment by BT in full fibre avoids volume losses to rival networks but this value is inherently risky and uncertain

A5.19 The return on investment on the full fibre asset will depend on the incremental revenue for full fibre services. This in turn depends on the extent of avoided losses to rival networks which follow from the fibre investment, as these volumes do not cannibalise Openreach's customer base. The uncertainty and risk relating to the size of this benefit from investing (and avoiding cannibalisation) must, therefore, feature in the estimation of the fair bet cap.

A5.20 Without taking account of these avoided losses, [X]. [X]

A5.21 The value of avoided losses, however, are highly uncertain, as they depend on the likelihood and scale of alternative network rollout in a counterfactual scenario where Openreach would also invest in alternative technologies, and BT would use converged technologies to offer higher and more reliable speeds.

A5.22 This gives rise to the risk of scenarios where Openreach invests in a fibre network when it would have been more profitable to continue to invest in FTTC and/or G.Fast instead.

A5.23 When making the decision to invest in a fibre network, investors fully take on this risk, which is not being mitigated by Ofcom's proposals in the WFTMR. Ofcom takes the view that avoided losses represent a source of value to BT's investment cases.⁴⁶ The uncertainty and risk relating to the size of this benefit must, therefore, feature in the estimation of the fair bet cap.

The costs of fibre deployment are uncertain

A5.24 Fibre build costs are uncertain as they depend on a range of local and other factors which are difficult to predict with accuracy. For example:

⁴⁵ Ofcom has indicated that the legitimate commercial responses to competition by Openreach may be restricted to meet policy objectives. It says "therefore, while rival networks to Openreach are becoming established, we consider it appropriate to limit Openreach's commercial flexibility to a greater extent, including pricing arrangements that might normally be regarded as legitimate commercial reactions to competitive entry for operators with SMP." WFTMR 2020, Annex 15, A15.18.

⁴⁶ In the case of FTTC, for example, Ofcom says that "a significant driver of FTTC roll out was to avoid potential losses of customer losses to Virgin". Ofcom asserts its FTTC fair bet assessment under-stated this assessment, suggesting that Ofcom believes it should be included. WFTMR 2020, Volume 4, paragraph 1.88.

- Labour costs are uncertain, which is exacerbated by possible limitations on use of overseas labour
- Deployment costs are uncertain because of difficulties in getting timely and cost-effective access to land, tenanted properties and public roads⁴⁷
- The costs of remedial works to ducts and poles is uncertain as ducts may have collapsed or been damaged over time e.g. due to tree roots. Re-use of poles may be impeded due to the age of poles or previous placing of equipment part way down the pole which prohibits access to the top
- Although Openreach is refining its provisioning techniques and cost, uncertainties remain⁴⁸

A5.25 These risks were acknowledged in the Government's FTIR. It stated "[b]uilding infrastructure that will support world-class connectivity across the country is a significant project. The pace of roll out will depend on various factors, including availability of labour, sensible management of road closures and supply chain factors."⁴⁹

A5.26 We welcome the Government's intention to "work with industry to identify and mitigate the practical challenges" but for BT (and other fibre operators) cost risks remain significant until these mitigations are found and implemented.

There are medium to longer term risks posed by rival technologies

A5.27 Given the timescales involved for fibre investment, there are medium to longer term risks of technology obsolescence if other technologies develop into viable and cost-effective alternatives.

A5.28 5G fixed wireless access (FWA) offers the prospect of much higher speeds and fewer restrictions on data usage than 4G FWA services. This will offer a reasonable alternative to fixed (wired) broadband for many customers as 5G becomes more widespread, particularly in areas where mobile coverage is particularly strong.

A5.29 Wireless technologies can also evolve to provide fibre-comparable broadband services. For instance, the 60GHz spectrum can be used to connect homes wirelessly with gigabit speeds and low latency (e.g. as being tested by Facebook Terragraph using mesh networks).⁵⁰ If the signal propagation issues associated with such high frequency spectrum can be solved through innovation, and with adequate backhaul capacity, the risk such wireless technologies pose to demand for fibre in the last mile could be particularly strong.

A5.30 Low earth orbit (LEO) satellite offers the prospect of commercial broadband at low latency and higher speeds, ranging from 100Mbps to gigabits per second. SpaceX and Telesat are launching LEO constellations aiming for commercial offers as early as 2020, while Amazon has shared its plans to launch thousands of LEO satellites (Project Kuiper)

⁴⁷ We welcome that the Government is considering legislative and non-legislative options to reduce the barriers to cost-effective fibre deployment, but as things stand, significant risks exist.

⁴⁸ BT Q4 FY2020, [Q4 analyst audio replay](#).

⁴⁹ DCMS, 23 July 2018. [Future Telecoms Infrastructure Review](#), page 5.

⁵⁰ In the US, Verizon is already deploying 5G with 28GHz and 39GHz mmWave band spectrum. Verizon, 19 December 2019. [Understanding the 5G spectrum](#).

to provide broadband services around the world over the coming years. Although timing and pricing of these services remain uncertain, they pose a medium-term risk to fibre investment.

A5.31 Ofcom concludes that these technologies do not offer a material source of competition to fixed access services during the review period (i.e. to 2026). This is because Ofcom is unsure how these services will evolve in the near-term as they are new (in the case of LEOs) or not yet widespread (in the case of 5G mobile broadband).

A5.32 But within the timeframe of fibre investment (i.e. over several decades) these technologies could offer a high-quality alternative to fibre customers and this is a risk borne by fibre investors.

Systematic risks

A5.33 Turning to systematic risks, these relate to factors which make fibre investment returns more correlated with the macro-economic cycle. We see strong (and economically robust) reasons why the asset beta for new fibre access services will be higher than for existing services reflecting both demand and cost factors (which is the only basis for assessment in the absence of benchmark pure-play FTTP operators).

Higher operating leverage

A5.34 A project with high fixed costs will tend to have profits that are more sensitive to changes in revenues. For example, when the present value of fixed costs is very large relative to the present value of revenues, a decline in revenues (where costs are largely unchanged) will have a disproportionate impact on the present value of returns (cash flows). Our fibre investment requires a high degree of capital outlay in early stages of the project, creating larger fixed assets and higher operating leverage than for existing networks. Ofcom accepts this and points out the higher degree of operating leverage for FTTP investment than for FTTC investment; it states "*the incremental capital expenditure required to roll out FTTC was low in comparison to the outlay required to roll out an FTTP network (as FTTC was an overlay to the copper network).*"⁵¹

Higher income elasticity of demand

A5.35 More discretionary (non-essential) goods or services will have higher income elasticity of demand (i.e. demand varies more when income changes), and therefore higher systematic risk than for more essential goods or services.

A5.36 Even where demand for entry level fibre products is supported by regulatory enablers, higher speed fibre products are likely to be perceived and treated as luxury products. The uptake of such products will be more sensitive to income levels and would therefore slow down during an economic downturn. This indicates a higher systematic risk for fibre than for copper-based services which are likely to be more stable during a downturn. This risk is heightened by the current COVID-19 crisis, following which uptake of fibre services may slow if the UK economy goes into recession.

⁵¹ WFTMR 2020, Annex 21, paragraph A21.49.

Implications for asset beta

A5.37 Both of these factors are recognised by Ofcom and accepted as leading to higher systematic risk for FTTP services (than for FTTC services). It says, for example:

- *“Speeds that can only be delivered via FTTP currently attract a retail premium. To the extent this means these services are currently perceived as a luxury product, this could imply a higher income elasticity of demand and greater beta risk.”⁵²*
- *“FTTP capex is expected to be greater per premise passed compared to FTTC. Further, FTTP is in the build phase and will be throughout the next control period whereas the capital expenditure programme on FTTC is virtually complete. This would imply much higher operating leverage for FTTP during the build phase and hence a higher asset beta, other things equal.”⁵³*

A5.38 But Ofcom achieves a differential between FTTP and FTTC systematic risk not by increasing the asset beta for FTTP, but by lowering that for FTTC (to align it with Openreach copper assets, thereby lowering its asset beta from 0.65 to 0.57). Only six months ago (in the BCMR 2019 Statement), Ofcom categorised FTTC in the 'Other UK Telecoms' category. We strongly disagree for the reasons set out in Annex 6.

A5.39 In the absence of evidence showing a significant reduction in the BT Group asset beta, and given the clear evidence of a retail price premium for FTTC and a significant proportion of customers continuing to regard a superfast service as discretionary, FTTC should continue to be categorised in 'Other UK Telecoms' with an asset beta of 0.65 instead of Ofcom's estimate of 0.57.

A5.40 Although a cost-based charge control is not proposed for FTTC in Area 2, lowering the asset beta for FTTC means that Ofcom underestimates the WACC for FTTP which is key input to the fair bet assessment to FTTP. The underestimate of the FTTC WACC also means that Ofcom overestimates the degree of cost over-recovery arising from setting a flat price (in real terms). The cost-based price proposed in Area 3 (in the absence of a fibre build commitment by BT) will also be too low.

⁵² WFTMR 2020, Annex 21, paragraph A21.54.

⁵³ WFTMR 2020, Annex 21, paragraph A21.56.

A6. Cost of capital

- A6.1 In this annex, we consider Ofcom's estimates of the BT weighted average cost of capital (WACC) and the associated regulatory allowed return which represents Ofcom's view on the appropriate return on capital employed. Ofcom calculates a WACC (nominal, pre-tax) of 8.1% for BT Group, lower than its estimate of 8.3% in its 2019 BCMR statement. The reduction in Ofcom's estimate is due to a reduction in its cost of debt estimate.
- A6.2 Ofcom has not updated some of its estimates of individual parameters that make up its current WACC calculation from its 2019 BCMR statement. Ofcom argues that, because the 2019 BCMR statement was less than six months before this WFTMR consultation, it will only update these parameters in its next WFTMR publication. We understand this may be Ofcom's draft statement, expected later this year or early 2021.
- A6.3 We have concerns with our and other stakeholders' ability to review and comment on any amendments Ofcom makes to WACC parameters at this later time. Consistent with Ofcom's obligations to consult, if Ofcom makes material changes to its estimates based on new evidence, we would expect to be given ample opportunity to review and comment on such evidence in advance of a draft or final statement being published.

We agree with Ofcom's objectives of promoting efficient investment signals and consistency of decisions in estimating the WACC

- A6.4 In estimating the WACC for regulatory purposes, Ofcom's objectives are to promote efficient price and investment signals, stability in its approach, consistency in its decisions and transparency over its methodology.⁵⁴
- A6.5 We agree with these objectives. As Ofcom itself notes, "It is important for investors to be able to commit risky capital in the knowledge that our approach to price regulation provides an expectation, but not the guarantee of recovery of efficient costs, including the cost of finance."⁵⁵ Without such an expectation, investors are less likely to commit to risky investment with adverse effects for customers who are less likely to see the benefits of investment (i.e. higher speed and more reliable broadband services).
- A6.6 We have significant concerns about whether Ofcom's WACC estimates, as set out in the WFTMR consultation, meet Ofcom's objectives. In particular, Ofcom's approach to categorising certain Openreach services, specifically FTTC services (which have unexpectedly changed category, resulting in a markedly lower WACC), does not signal a stable or predictable approach over time and is inconsistent with Ofcom's previous decisions.
- A6.7 Ofcom's estimate of the WACC for FTTP also does not satisfy its first objective of promoting efficient price and investment signals. Ofcom's WACC estimate underestimates the systematic risk of FTTP investment which is a key input to the assessment of an appropriate risk adjusted return that Openreach should have the

⁵⁴ WFTMR 2020, Annex 21, paragraph A21.11.

⁵⁵ WFTMR 2020, Annex 21, paragraph A21.11.

opportunity to earn, consistent with the principle of the fair bet (as set out in chapter 3 of the Main Response).

A6.8 We, and Ofcom, agree that the relevant cost of capital to use in assessing the fair bet would be that associated with fibre access at the time of the original investment.⁵⁶ It is critical, therefore, that the FTTP WACC estimated now appropriately reflects the systematic risk of fibre investment in order to avoid upside outcomes being unduly truncated, potentially undermining incentives to invest. This would not deliver an effective fair bet regime which is defined by Government, as one which allows “firms making large and risky investments to have confidence that any regulation will reflect a fair return on investment, commensurate to the level of risk incurred at the time of making the investment decision.”⁵⁷

A6.9 We now consider Ofcom's estimates of individual parameters that comprise its WACC calculation for BT Group.

Ofcom underestimates the BT Group WACC

Expected market return

A6.10 Ofcom has maintained its estimate of the real expected market return of 6.7% from its 2019 BCMR statement.⁵⁸

A6.11 Ofcom's objectives of stability and consistency in its approach imply it should ensure its estimates of individual parameters do not fluctuate by wide margins across market reviews (particularly as, to date, they have occurred at intervals of 1-2 years). Ofcom's expected market return estimate should therefore remain broadly similar to its BCMR estimates (as it was estimated a matter of months ago).

A6.12 That said, Ofcom's objective of promoting efficient investment signals supports a slightly higher expected market return than its estimate of 6.7%. As noted above, this is to send an appropriate signal to investors, at a time of transformational investment, that Ofcom's approach gives Openreach an opportunity to recover efficient costs including financing costs, and the opportunity to appropriately retain upsides where risks have been taken.

A6.13 We set out our views on the expected market return in our response to Ofcom's 2019 BCMR consultation.⁵⁹ In summary, we argued that Ofcom should place most weight on long-run historical ex-post evidence. The expected market return tends to be relatively stable over time.⁶⁰ This means that long-run historical returns are the most reliable method for estimating the expected market return going forward, as they capture, more accurately than other methods, this long-run stability. Long-run historical returns also provide objective evidence, in the sense they are *realised* returns, as opposed to an estimate based on judgement. The risk of estimation error is smaller, therefore, than for alternative approaches.

⁵⁶ WLA 2018, Annex 6, paragraph A6.74 to A6.76.

⁵⁷ DCMS, 29 October 2019. [Statement of Strategic Priorities](#), page 8.

⁵⁸ This estimate is real in CPI terms.

⁵⁹ BT, 18 January 2019. [Response to Ofcom's consultations on the Physical Infrastructure and the Business Connectivity Market Reviews](#), Annex 2, pages 5 to 13.

⁶⁰ As described in our submission to the BCMR, the expected market return tends to remain stable over time, whilst movements in the risk-free rate and the equity risk premium (which together sum to the expected market return) offset each other. For example, after the global financial crisis, government bond yields fell (such that the risk-free rate declined), but this was mainly offset by an increase in the equity risk premium.

A6.14 By contrast, Ofcom's use of dividend growth models (DGMs) to estimate the expected market return in its last market review relied on subjective assumptions on dividend growth, rather than realised fact. Further, alternative assumptions on dividend growth within a plausible range lead to much higher estimates of the expected market return than using Ofcom's assumptions.

A6.15 In its recent provisional findings for NATS' appeal of its price control decision, the Competition and Markets Authority rejected the use of forward-looking estimates based on DGMs to estimate the expected market return because of the wide range of estimates:⁶¹

"We observe that the forward-looking approaches result in a wide range of results which are driven to a great extent by the assumptions made. However, our current view is that these assumptions are not well-supported by evidence of past dividend growth rates. As a result, we have not placed weight on forward-looking TMR estimates."

A6.16 Given the wide confidence interval around estimates based on a DGM, Ofcom should place most weight on long-run historical ex post evidence.⁶² This supports an equity market return of up to 7%, based on data from Dimson, Marsh and Staunton.

A6.17 In its 2019 BCMR statement, Ofcom responded to our arguments by noting that its final estimate of 6.7% was not solely supported by DGMs, but was also in the range supported by long-run historical evidence. Ofcom pointed to the 2018 UKRN report, which recommended a real (CPI-deflated) TMR range of 6%-7%.

A6.18 The UKRN report also argued that in regulated industries the harm from disincentivising investment by setting allowed returns too low is greater than harm to customers of high prices from setting allowed returns too high. The study concluded that regulators should err towards the higher end of their estimated range in estimating the WACC: *"when the consequence of setting too low a RAR [Regulatory Allowed Return] is a complete loss of investment, the optimal choice of the RAR (and hence, in this simplified framework the RER) [Regulatory Expected Return] is high, in terms of the percentile within the range of distribution of the true WACC."*⁶³

A6.19 The UKRN recommendation is particularly relevant at this moment because Ofcom is developing a long-run regulatory framework for incentivising investment in FTTP including by moving to a five-year market review period. Stable and long-term regulation is also a strategic priority for the Government reflecting a concern that fibre investment may be made riskier by regulatory change. As noted above, the WACC estimated now for FTTP is a critical indicator of how Ofcom perceives the systematic risks associated with the investment. Underestimating the expected market return (and hence the WACC) may chill investment if it is taken as a signal that 'bets' may not be treated fairly in the future.

A6.20 We therefore believe Ofcom should place most weight on the top end of the range supported by long-run historical evidence for the expected market return. This supports a point estimate for the real expected market return of 7%.

⁶¹ Competition and Markets Authority, 24 March 2020. [NATS \(En Route\) Plc/CAA Regulatory Appeal, Provisional findings report](#), paragraph 12.234, page 190.

⁶² BT, 18 January 2019. [Response to Ofcom's consultations on the Physical Infrastructure and the Business Connectivity Market Reviews](#), Annex 2, paragraph 2.13.

⁶³ Wright, S, Burns, P, Mason, R and Pickford, D, 2018. [Estimating the cost of capital for implementation of price controls by UK Regulators](#), pages 1 to 163.

Risk-free rate

A6.21 Ofcom has maintained its nominal risk-free rate estimate of 1.5% from its 2019 BCMR estimate. This was based on spot and short-term average of yields on index-linked gilts.

A6.22 In our response to Ofcom's BCMR consultation, we highlighted that a risk-free rate estimate based on short-term averages could lead to volatile estimates over time. This creates regulatory instability at a time when investors require long-term certainty over key investment parameters, including Ofcom's estimate of the WACC. The current volatility in market conditions following the COVID-19 outbreak means using short-term averages will lead to even more volatile estimates at this market review.

A6.23 We continue to believe Ofcom should place more weight on long-run averages along with forward-looking interest rates to estimate the risk-free rate. Whilst long-run historical averages suggest a real risk-free rate against RPI which is slightly below zero, interest rates are set to increase over the next regulatory period. Table A6.1 shows interest rates are expected to increase by around 0.75% by the mid-point of the next regulatory period.

Table A6.1 – Consensus forecast of Official Bank of England interest rate

	2020	2021	2022	2023	2024
Independent average	0.70%	0.78%	0.99%	1.34%	1.55%

Source: HM Treasury Economic Forecasts, February 2020, Table M4, p18

A6.24 Given the evidence above, we believe Ofcom's estimate of a nominal risk-free rate of 1.5% is reasonable, as it aligns with the forecast of the Bank of England by the mid-point of the review period.

A6.25 The current COVID-19 crisis means that there is likely to be some short-term volatility in the data on government bond yields, when Ofcom comes to update its risk-free rate estimate in its WFTMR draft statement. Ofcom will have to reconsider its approach of using short-term averages to estimate the risk-free rate in light of these movements in interest rates.

A6.26 Whilst we agree with Ofcom's estimate of the risk-free rate in this consultation, we believe it should use long-term averages of gilt yields adjusted for forward-looking interest rates to update this estimate in its next WFTMR publication.

Cost of debt

A6.27 Ofcom has reduced its cost of debt estimate from 4.0% in the BCMR to 3.5%, by placing more weight on the cost of BT's new debt and less weight on embedded debt.

A6.28 Whilst BT's financing requirements over the market review period are uncertain, Ofcom has not provided any evidence for a 50:50 weighting for new and embedded debt (compared to its previous weighting of 20:80 in the BCMR 2019 Statement).⁶⁴

A6.29 We have reviewed BT's existing debt portfolio and the maturity date of individual debt instruments. The table below shows BT's existing debt instruments as of 31 January 2020. We calculate the proportion of debt that would need to be refinanced during the upcoming regulatory period from 2021 to 2026 assuming that all debt instruments are refinanced at the same balance immediately after maturity. We also assume that BT's

⁶⁴ WFTMR 2020, Annex 21, paragraph A21.28. BCMR 2019, Annex 21, paragraph A21.128.

total debt remains the same over the market review period, which is consistent with a fixed gearing if BT's equity value also remains the same.

A6.30 In Table A6.2, we estimate for each bond, the proportion of its interest cost that would reflect the existing interest rate relative to the proportion that would be the new interest rate once re-issued. Across all bonds, this provides the proportion of embedded debt for which the existing interest rate would apply over the next market review period. We calculate that [X]. This implies [X]

Table A6.2 – BT's existing bond instruments for calculating weight on cost of embedded debt

[X]

A6.31 This indicates that Ofcom should adopt a [X] weighting for new and embedded instead of its 50:50 weighting.⁶⁵

A6.32 This approach of estimating the weighting on embedded debt to new debt using a company's actual debt portfolio has been adopted by other UK regulators. For example, in its PR19 determination Ofwat estimates the weighting using forecasts of companies' new debt issuances relative to embedded debt from their business plans.⁶⁶ Ofcom should adopt a similar approach by taking account of BT's existing debt portfolio.

Use of benchmark BBB index

A6.33 For the cost of existing debt, Ofcom has moved away from using BT's actual embedded debt costs, and instead calculates the average yield on a benchmark BBB index. Ofcom argues this is a more transparent approach to estimating the cost of existing debt.

A6.34 Using a benchmark index to calculate the cost of existing debt could prevent BT's from recovering its efficiently incurred historical debt costs. If the yield on the benchmark index deviates from BT's actual historical debt cost, then Ofcom's approach could lead to BT either over or under-recovering its historical debt costs.

A6.35 In this case, BT's actual embedded debt is [X] compared to Ofcom's estimate of 4.0%,⁶⁷ which means the benchmark index is a good approximation for BT's actual embedded debt cost. However, there may be circumstances in future, for example when Ofcom updates its cost of debt estimate in its next WFTMR publication, that the yield on the benchmark index deviates from BT's embedded debt cost. We therefore believe Ofcom should estimate the cost of embedded debt using BT's actual debt costs for its next WFTMR publication.

A6.36 We also believe such an estimate can be validated using BT's published annual report, which sets out the weighted average effective fixed interest rate. This addresses Ofcom's concern about the transparency of using BT's actual embedded debt costs to calculate the cost of existing debt.

Impact of revised debt costs on WACC

A6.37 Our changes to Ofcom's cost of existing debt estimate and the weighting on existing vs new debt results in an increase in the cost of debt estimate from 3.5% to 3.8% and

⁶⁵ WFTMR 2020, Annex 21, paragraph A21.28.

⁶⁶ Ofwat, July 2019. [PR19 draft determinations, Cost of capital technical appendix](#), page 63.

⁶⁷ WFTMR 2020, Annex 21, paragraph A21.27.

increases the BT Group WACC from 8.1% to 8.3% (holding the remainder of Ofcom's parameter estimates constant).

Table A6.3 – Ofcom vs BT estimate of the cost of debt

	Ofcom view		BT view	
	Estimate	Weighting	Estimate	Weighting
Cost of existing debt	4.0%	50%	[X]	[X]
Cost of new debt	2.9%	50%	2.9%*	[X]
Issuance fees	0.1%	-	0.1%**	
Cost of debt	3.5%		3.8%	

Source: *WFTMR 2020, Annex 21, paragraph A21.24. **WFTMR 2020, Annex 21, paragraph A21.29.

Asset beta

A6.38 Ofcom has not updated its estimate of the BT Group beta since its 2019 BCMR statement. Ofcom's asset beta estimate of 0.68 for BT Group is based on a 5-year estimation window using daily data on stock returns from Bloomberg. Ofcom used a longer estimation window in the BCMR than in its prior reviews because of uncertainty associated with 2-year windows during the Brexit period.

A6.39 Ofcom's choice of estimation window depends on the wider market environment in which it is estimating the asset beta. The current COVID-19 crisis means there may be short-term changes in BT's share price and the market index as a result of a small number of data points having an unduly large effect on the beta.⁶⁸ These short-term changes in market returns may not provide a reliable *forward-looking* estimate of BT's beta over a longer market review period of five years.

A6.40 We therefore believe the estimation window will need to be reconsidered before Ofcom's next WFTMR publication (and subject to proper consultation). We expect to have the opportunity to review and comment on Ofcom's estimate in its next publication.

Forward-looking gearing

A6.41 Ofcom assumes a forward-looking gearing of 40% in its WACC calculation, the same as its assumptions for the 2019 BCMR Statement. Ofcom does not consider any new evidence on BT's gearing in its WFTMR consultation.

A6.42 In light of the current COVID-19 crisis, the value of equity for the majority of listed companies, including BT, has declined, and in some cases declined substantially. If the value of debt is assumed to hold constant, the gearing of these companies would increase as a result of a decline in the equity value.

A6.43 Ofcom should not mechanically update its gearing calculation based on short-term movements in equity valuations. When Ofcom updates its gearing calculation in its next WFTMR publication, it should take account of longer-term trends in BT's gearing, rather than focusing on short-term market movements.

⁶⁸ In its 2019 BCMR Statement, Ofcom noted that the Brexit referendum had a significant impact on BT's 2-year beta, and so it adopted a longer estimation window of 5 years. Similarly, Ofcom must reconsider the estimation window again in light of the COVID-19 crisis. Source: Ofcom, 28 June 2019. [Promoting competition and investment in fibre networks: review of the physical infrastructure and business connectivity markets](#), paragraphs A21.141 to A21.143.

A6.44 If Ofcom makes material changes to its gearing estimate based on new evidence, we would expect to be given ample opportunity to review and comment on such evidence in advance of a draft or final statement being published.

Tax

A6.45 Ofcom assumes a 17% corporate tax rate in its pre-tax WACC calculation, which does not reflect the current Government's decision to freeze corporate tax rates at 19%.⁶⁹ Ofcom should use a 19% tax rate, which would increase the BT Group WACC estimate by 0.2% points.

We estimate BT Group's WACC (nominal, pre-tax) as 8.7%

A6.46 Based on our proposed changes to Ofcom's estimates of the cost of debt, expected market return, risk-free rate and tax rate, we estimate BT Group's WACC to be 8.7%, higher than Ofcom's estimate of 8.1%. Our calculation is set out in Table A6.4.

Table A6.4 – Comparison of Ofcom and BT View of BT Group WACC

	Ofcom View	BT View	Comment
CPI	2.0%	2.0%	-
Nominal risk-free rate	1.5%	1.5%	-
Nominal ERP	7.3%	7.6%	Calculation
Nominal TMR	8.8%	9.1%	BT view derived from upper end of long-run historical evidence
Debt beta	0.1	0.1	-
Asset beta	0.68	0.68	Ofcom's BCMR estimate
Forward-looking gearing	40%	40%	-
Equity beta	1.07	1.07	Calculation
Cost of equity (post-tax)	9.3%	9.6%	Calculation
Tax rate	17%	19%	BT assumption based on current corporate tax rate
Cost of debt	3.5%	3.8%	BT estimate (more weight placed on embedded debt and higher cost of existing debt)
WACC (nominal, pre-tax)	8.1%	8.7%	Calculation

Ofcom does not correctly categorise Openreach services under its WACC disaggregation approach

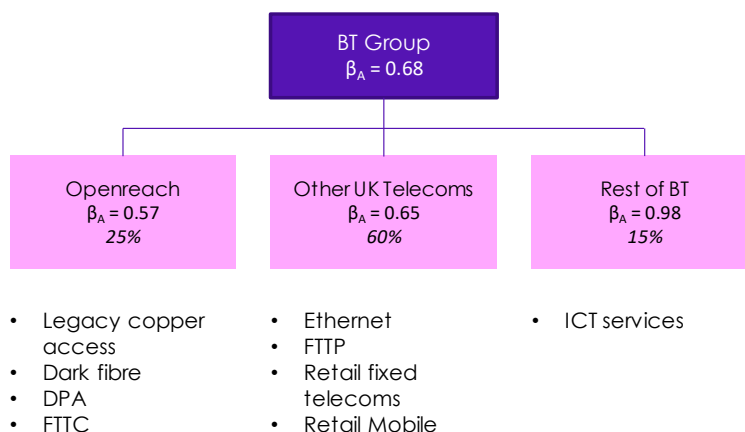
A6.47 Ofcom applies different remedies to different markets where BT is found to have SMP. Ofcom needs to estimate a WACC for each of these markets to ensure any cost-based charge controls it applies reflect the systematic risk associated with activities in those markets. However, Ofcom must also ensure its estimates of the WACC for individual services reconciles back to the BT Group WACC, since the asset beta that supports the

⁶⁹ HM Treasury, 11 March 2020. [Budget 2020](#), page 5.

BT Group WACC is directly observable from the market, providing an objective 'anchor' for Ofcom's disaggregated WACC estimates.

A6.48 Ofcom maintains its 3-way disaggregation approach to estimating the WACC for individual BT services, with the categories of 'Openreach', 'Other UK Telecoms' and 'Rest of BT'. Ofcom categorises DPA, dark fibre, MPF and FTTC services under Openreach, and categorises leased lines and FTTP services under 'Other UK Telecoms', as shown in Figure A6.1.

Figure A6.1 – Ofcom approach to disaggregating the BT Group WACC



A6.49 Whilst we agree with the principle of Ofcom's 3-way disaggregation approach, we do not agree with its categorisation of individual services, as described below.

FTTC should be categorised in 'Other UK Telecoms' not 'Openreach'

A6.50 In its 2019 BCMR statement and other recent market reviews, Ofcom categorised FTTC services in the 'Other UK Telecoms' category.⁷⁰ However, in this WFTMR consultation, Ofcom has shifted FTTC to the Openreach category, only 2 years after deciding, for the first time, to impose price regulation on certain FTTC services.⁷¹ Ofcom argues that systematic demand risk for FTTC has declined as superfast broadband has become a more mature product.

A6.51 No new evidence is provided to support the proposal even though the change is significant. Nor does Ofcom check whether the claimed decline in the FTTC asset beta is reflected in a change in BT Group asset beta (which is kept the same as for the BCMR Statement).

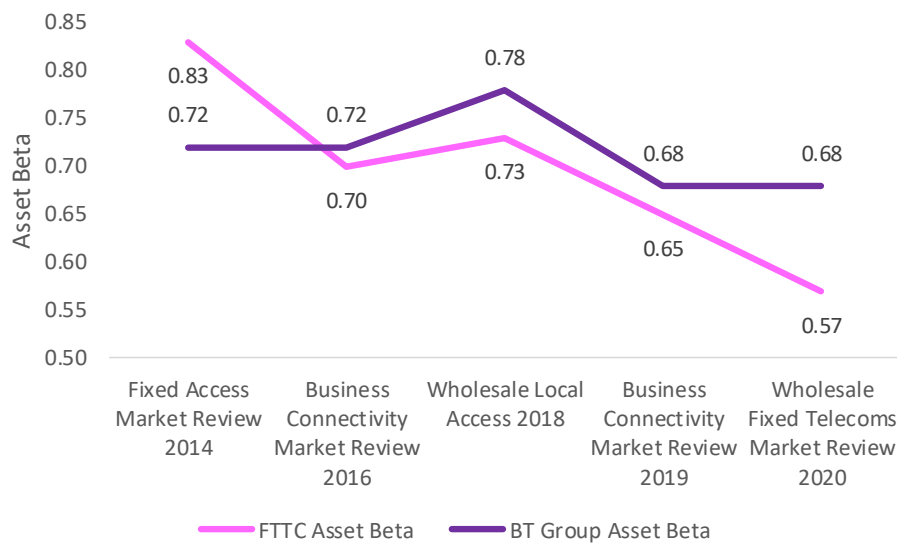
A6.52 If there has been a decline in the asset beta (as FTTC matures) then it has already been captured in the decline in the 'Other telecoms' asset beta from 0.73 in Ofcom's 2018 WLA Statement to 0.68 today.⁷²

⁷⁰ Ofcom, 28 June 2019. [Promoting competition and investment in fibre networks: review of the physical infrastructure and business connectivity markets](#). Annex 21, paragraph A21.158.

⁷¹ WFTMR 2020, Annex 21, paragraph A21.52.

⁷² Going back slightly further, in Ofcom's Fixed Access Telecoms Review from 2014, Ofcom estimated an asset beta of 0.83 for 'Rest of BT', which at the time applied for FTTC. The BT Group asset beta at the time was 0.72, similar to the BT Group asset beta today of 0.68. The reduction in Ofcom's estimate of the asset beta from 0.83 in 2014 to 0.73 in its 2018 WLA statement to 0.68 in the 2019 BCMR already reflects any perceived reduction in FTTC systematic risk. Any

Figure A6.2 – Decline in Ofcom's estimate of the FTTC asset beta over time



Source: Ofcom, 26 June 2014. [Fixed access market reviews: wholesale local access, wholesale fixed analogue exchange lines, ISDN2 and ISDN30 – Annexes](#), page 163; Ofcom, 28 April 2016. [Business Connectivity Market Review 2016 – Final Statement](#), Annex 30, page 57; Ofcom, 28 March 2018. [Wholesale Local Access Market Review: Statement](#), Annex 20, page 75; Ofcom, 28 June 2019. [Promoting competition and investment in fibre networks: review of the physical infrastructure and business connectivity markets](#), Annex 21, p319; WFTMR 2020, Annex 21, p214.

A6.53 Ofcom's proposal implies that the systematic risk associated with FTTC and standard broadband provided over copper is the same. We disagree. FTTC continues to hold a premium position relative to standard copper broadband with 36% of the market continuing to be unwilling to pay the price premium (suggesting it is seen as discretionary).⁷³ This points to demand for superfast which is still, in large part, discretionary, and which is likely, therefore, to be more sensitive to wider economic changes than demand for standard copper broadband, and hence a higher asset beta.

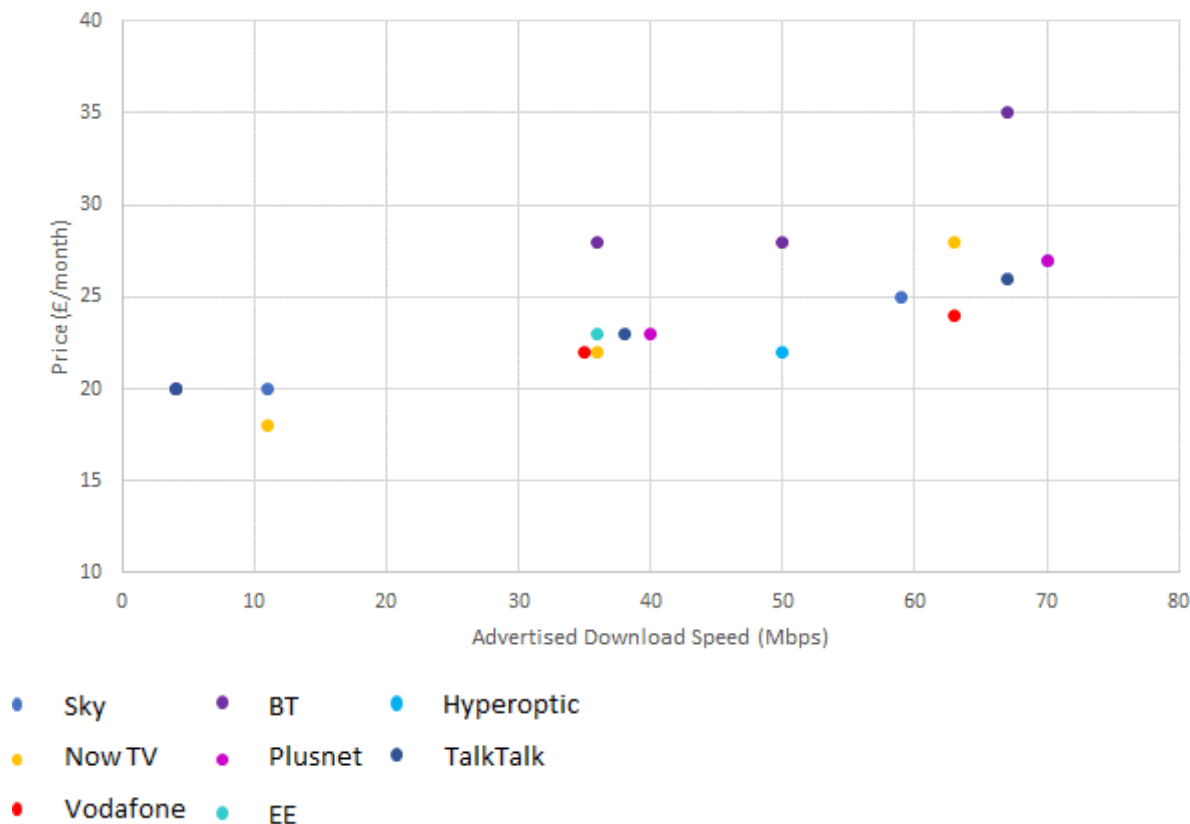
A6.54 A retail price premium indicates that superfast broadband is more of a premium product than an 'entry-level product', with more discretionary demand.⁷⁴ Our analysis indicates a clear price premium for superfast broadband reflecting additional service capabilities (compared to standard broadband) which some customers opt for and some do not. This is shown in Figure A6.3, which compares the retail price of broadband-only products to the bandwidth advertised.

further reduction is not supported by new evidence since the 2019 BCMR. Source: Ofcom, 26 June 2014. [Fixed access market reviews: wholesale local access, wholesale fixed analogue exchange lines, ISDN2 and ISDN30](#), Annex 14, table A14.1.

⁷³ Ofcom, 4 July 2019. [Communications Market Report 2019](#), Data tables.

⁷⁴ WFTMR 2020, paragraph A21.47.

Figure A6.3 – Retail Pricing of Broadband Only Products (as of 28 February 2020)



Source: Company websites, note: the retail pricing is the advertised price for broadband-only products as of 28 February 2020. The advertised products may differ in terms of contract length, set-up fees, and other terms.

A6.55 Figure A6.3 shows a clear positive relation between the broadband speed and the advertised price. In particular, there is a price premium between standard broadband (up to 30Mbps) and superfast broadband (between 30Mbps and up to 100Mbps). Ofcom's own analysis of the retail broadband market shows a similar positive relationship.⁷⁵

A6.56 A premium product (such as superfast broadband) which has not yet gained 'mass-market' status implies higher income elasticity of demand and, therefore, greater beta risk for FTTC than for MPF and ADSL-based broadband.

A6.57 In addition to the retail price premium, we have considered the current level of take-up for superfast vs standard broadband. Less than half (42%) of households that currently have a broadband connection take a superfast broadband service provided over FTTC.⁷⁶ By comparison, almost the same proportion (36%) take a standard broadband service provided over MPF.⁷⁷ There remains a significant segment of the population who take a standard broadband service that offer a basic level of service sufficient for their needs.

⁷⁵ WFTMR 2020, Volume 2, figure 2.10.

⁷⁶ Ofcom, 4 July 2019. [Communications Market Report 2019](#).

⁷⁷ Ofcom, 4 July 2019. [Communications Market Report 2019](#).

- A6.58 Broadening the set of households further to include households that do not take a broadband service, only 40% of all households take a superfast broadband service provided over FTTC.⁷⁸ The same proportion (40%) either take a standard broadband service provided over MPF or do not take a broadband service at all. In this context, superfast broadband service provided over FTTC is clearly not a basic entry-level connectivity product, nor has it gained mass-market status, since just as many households either are satisfied with standard broadband over MPF (or do not take broadband at all).
- A6.59 Whilst demand for FTTC services has been increasing over time, it is premature of Ofcom to re-categorise FTTC in the lower risk 'Openreach' category at a time when a substantial segment of the population continues to view copper broadband services as capable of delivering their basic connectivity needs. These households continue to view FTTC as providing a more premium service and regard this as discretionary. We can infer from this that the systematic demand risk for FTTC remains higher than for standard copper because upgrades and downgrades in response to macroeconomic events are more likely than for standard broadband.
- A6.60 We therefore conclude that FTTC services should not be placed in the same category as standard copper services. Ofcom should continue to place FTTC services in the 'Other UK Telecoms' category.

FTTP investment is riskier than FTTC investment today

- A6.61 Ofcom argues that FTTP services are riskier than FTTC services because of greater demand risk and greater operating leverage. Ofcom categorises FTTP under 'Other UK Telecoms', which it believes captures the difference in systematic risk with FTTC services, because FTTC is categorised in the lower risk Openreach category.
- A6.62 We agree with Ofcom's reasoning for why FTTP services are riskier than FTTC services, but disagree with the implied WACC for FTTP services. As discussed above, we believe Ofcom has underestimated the risk of FTTC services. Ofcom should recategorize FTTC services to the 'Other UK Telecoms' category, and (consistent with its own reasoning) recognise that the WACC for FTTP services would then be higher than that for 'Other UK Telecoms'.
- A6.63 Ofcom's estimate of the FTTP WACC at this market review is crucial in setting investors' expectations about whether they can expect to recover their efficiently incurred costs for FTTP, including the cost of capital, as well as allowing for upside commensurate with risks taken. As discussed in chapter 3, Ofcom must provide long-term signals to investors that demonstrate regulatory certainty and stability in order to allow investors the opportunity to recover efficiently incurred costs. Estimating too low an FTTP WACC without providing robust evidence will undermine investor confidence in Ofcom's application of the fair bet principle. Our analysis of the evidence below shows a clear difference in the degree of systematic risk associated with FTTP and FTTC investment today. This is important because it establishes a reference point for the project specific cost of capital at the time of investment, which must be taken into account as part of the fair bet assessment.
- A6.64 Ofcom's approach means its asset beta estimate for FTTP at this consultation (0.65) is the same as its estimate of the asset beta for FTTC and business connectivity services in the Business Connectivity Market Review (0.65), which was only six months prior to this

⁷⁸ Ofcom, 4 July 2019. [Communications Market Report 2019](#).

consultation. FTTP is a nascent service with unproven demand (especially in terms of willingness to pay for higher speeds) and high operating leverage. That there is a premium on the WACC between FTTP and FTTC is only the result of the decrease in the WACC on FTTC since the BCMR, a change with which we disagree for the reasons given above.

A6.65 However, Ofcom also argues that its proposals for copper switchover, namely no requirement to supply new copper services once ultrafast coverage exceeds 75% of an exchange area and removal of copper charge controls once full fibre covers the entire exchange area, help reduce demand risk for FTTP in future. Ofcom believes that demand risk for FTTC and FTTP will converge over time.⁷⁹

A6.66 Risks relating to migration are more appropriately seen as specific risks (rather than systematic risks), as discussed in chapter 3 and Annex 5. In any event, Ofcom's proposals would, if implemented as proposed, only help mitigate, not remove such risks. They certainly do not mean that the demand risk for FTTP and FTTC are similar now and any convergence will take many years (as FTTC is not yet a mass market product).

A6.67 Ofcom also highlights the higher operating leverage associated with investing in FTTP, because of the higher fixed cost of investment during the build phase. We agree with Ofcom's conclusion that FTTP leads to higher operating leverage than FTTC. However, Ofcom has not recognised the impact of the difference in operating leverage on the asset beta.

A6.68 We provide an indicative view of how Ofcom might quantify the size of the uplift relative to the WACC for 'Other UK Telecoms'. We have adapted a standard theoretical framework for how the asset beta of a firm changes with its degree of operating leverage. This approach is described in more detail in the Appendix to this Annex.

A6.69 Using this framework, we have considered the degree of operating leverage for BT's FTTC and FTTP services, based on the actual fixed and variable costs for each activity. By adjusting the asset beta for FTTC services (using the beta for 'Other UK Telecoms' of 0.65) for the degree of operating leverage associated with FTTP, we calculate an FTTP asset beta of [X]. This provides a WACC estimate for FTTP of [X] (which also incorporates our other WACC parameter estimates as shown in Table A6.4).

A6.70 Our approach is conservative because it does not reflect the greater demand risk associated with FTTP vs FTTC, and only quantifies the impact of greater operating leverage. An adjustment for greater demand risk would result in an asset beta higher than [X].

A6.71 We conclude Ofcom should estimate an FTTP asset beta of at least [X], to reflect the higher operating leverage and demand risk relative to FTTC.

The Openreach WACC is inappropriate for local access dark fibre

A6.72 Ofcom has also underestimated the true cost in supplying local access dark fibre (LADF) in choosing to apply its lowest WACC for telecoms services. For the reasons given below, Ofcom should place LADF in the 'Other UK Telecoms' category, and

⁷⁹ WFTMR 2020, Annex 20, paragraph A21.53.

recognise it has a similar level of risk as active leased lines services which remain within the 'Other UK Telecoms' category.

A6.73 Ofcom categorises dark fibre services, both for inter-exchange and the access segment, as a low-risk 'Openreach' category service in setting the WACC. Ofcom justifies this on the basis that the charges for dark fibre are not based on bandwidth (so without demand risk associated with a bandwidth gradient); and that dark fibre access will principally be used for mobile backhaul (with assumed relatively income inelastic demand).⁸⁰ As a result, Ofcom argues dark fibre services face less risk than access leased lines, and should be placed in the lower risk Openreach category.

A6.74 However, the bandwidth gradient for access leased lines has been reducing rapidly for business connectivity as Ofcom showed in its 2019 BCMR Statement.⁸¹ For example:⁸²

- the price differential between EAD 100Mbps and EAD 1Gbps is now only £246 per annum, which is an 18% rental premium for 1000% times the bandwidth capability.
- For a 5-year term, the EAD 10Gbps annual rental is just £0.36p per Gbps, compared to £13.74 for the EAD 100Mbps service (on a one-year term).

A6.75 This rental premium is likely to fall further if LADF is introduced as it will put more pressure on prices for higher bandwidth services due to the opportunity it creates for price arbitrage.⁸³ Ofcom cannot therefore assume the bandwidth gradient (small though it already is) will continue.

A6.76 Since Ofcom believes leased lines should be categorised to fall within 'Other UK Telecoms', a reducing bandwidth gradient for LADF does not set it apart from active leased line products as such, and is therefore no valid reason for it to be categorised differently.

A6.77 Further, Ofcom has no evidence to support its claim that the service will principally be used for mobile backhaul and we do not consider this will be the case. As described in the Openreach WFTMR response, [8].⁸⁴ Demand for access dark fibre from these customers is likely to be sensitive to wider economic conditions, supporting a higher asset beta based on 'Other UK Telecoms' services.

A6.78 We also disagree that LADF will have a materially lower operating leverage than active leased lines (given no electronics are delivered with LADF). Ofcom must provide evidence that the proportion of fixed costs to variable costs will be lower in relative terms for dark fibre as compared to active leased lines. In particular, active services include a significantly higher proportion of on-going variable cost as part of its end to end cost stack, resulting in lower operating leverage for active services as compared to LADF. Therefore, LADF circuits should be categorised in 'Other UK Telecoms', based on it having at least comparable operating leverage to active leased lines.

⁸⁰ WFTMR 2020, Annex 21, paragraph A21.65.

⁸¹ Ofcom, 28 June 2019. [Promoting competition and investment in fibre networks: review of the physical infrastructure and business connectivity markets](#), figure A7.2, page 70.

⁸² [Openreach Price list for Ethernet services](#). Accessed on 11 May 2020.

⁸³ That there is a small bandwidth gradient – higher speed services costing more – can be explained anyway by the extra electronic costs for higher speeds.

⁸⁴ See the Openreach response to the WFTMR for further details.

Summary on WACC Disaggregation

A6.79 The operating leverage adjustment we apply to calculate the WACC for FTTP means the FTTP WACC does not fall under any of Ofcom's three disaggregated categories. However, given the mean capital employed and earnings from FTTP is currently small relative to BT Group,⁸⁵ there would be minimal impact on Ofcom's disaggregation approach.

A6.80 Based on our estimates of the asset beta for FTTC and FTTP, we calculate the WACC for each of Ofcom's disaggregated categories in Table A6.5, including an additional category for FTTP. Our estimates of the general market parameters, including the risk-free rate, expected market return, inflation, tax rate, debt beta and gearing are described above in the previous section.

Table A6.5 – BT Estimate of the WACC for WFTMR

	BT Group	Openreach	Other UK Telecoms	FTTP	Rest of BT
CPI	2.0%	2.0%	2.0%	2.0%	2.0%
Nominal risk-free rate	1.5%	1.5%	1.5%	1.5%	1.5%
Nominal ERP	7.6%	7.6%	7.6%	7.6%	7.6%
Nominal TMR	9.1%	9.1%	9.1%	9.1%	9.1%
Debt beta	0.1	0.1	0.1	0.1	0.1
Asset beta	0.68	0.57	0.65	[X]	0.96
Weighting	100%	20%	65%	-	15%
Forward-looking gearing	40%	40%	40%	40%	40%
Equity beta	1.07	0.88	1.02	[X]	1.53
Cost of equity (post-tax)	9.6%	8.2%	9.3%	[X]	13.2%
Tax rate	19%	19%	19%	19%	19%
Cost of debt	3.8%	3.7%	3.8%	3.8%	3.9%
WACC (nominal, pre-tax)	8.7%	7.6%	8.4%	[X]	11.3%

A6.81 We estimate a WACC (pre-tax, nominal) of:

- 7.6% for Openreach, relative to Ofcom's estimate of 7.1%. This should apply to DPA and MPF services.
- 8.4% for 'Other UK Telecoms', relative to Ofcom's estimate of 7.9%. This should apply to leased lines, local access dark fibre and FTTC.
- [X] for FTTP relative to Ofcom's estimate of 7.9%.
- 11.3% for 'Rest of BT', relative to Ofcom's estimate of 10.9%.

⁸⁵ [X] compared to total MCE for Openreach of £13.7bn. Source: Openreach, BT Regulatory Financial Statements 2019, p33.

Appendix to Annex 6 – Quantifying the Operating Leverage Uplift

There is a positive relationship between operating leverage and asset beta

A6.82 In estimating the systematic risk of FTTC and FTTP relative to standard copper lines, Ofcom accepts that operating leverage is one of the key determinants of systematic risk:⁸⁶

“services that have greater operational leverage (i.e. require significant upfront investments or have a higher proportion of fixed costs) are more exposed to systematic risk and thus would have higher betas.”

A6.83 This view is well established in financial theory, where the literature highlights that firms with greater fixed costs as a proportion of their total costs (i.e. higher operating leverage) face more cyclicity in their earnings, and hence have a higher asset beta.⁸⁷

A6.84 There is recent regulatory precedent from the Competition and Markets Authority (CMA) for taking account of operating leverage when estimating the asset beta for a regulated company.

The CMA's calculation of operating leverage for Bristol Water

In its determinations for Bristol Water's price control in 2010, the Competition Commission (CC) compared the Bristol Water's cost structure to listed water company comparators.⁸⁸ The CC measured operating leverage by comparing total expenditure as a proportion of the regulated asset base, and found that Bristol Water had higher operating leverage. The CC used the relative operating leverage between Bristol Water and other water companies to apply an 18% asset beta uplift for Bristol Water.

More recently in 2015, the CMA again reviewed Bristol Water's price control determination and found that, on a range of different metrics,⁸⁹ Bristol Water had higher operating leverage than comparators.⁹⁰ The CMA adopted the same approach to calculating operating leverage as in the CC 2010 decision, and applied a 13% asset beta uplift for Bristol Water based on its higher costs relative to the regulated asset base.

Whilst the CMA's metric for operating leverage cannot directly be used to estimate the asset beta for FTTP (because an explicit regulated asset base for FTTP does not exist), its approach provides relevant precedent in UK regulation.

⁸⁶ WFTMR 2020, Annex 21, paragraph A21.44b.

⁸⁷ See for example Brealey, R.A., Myers, S.C. and Allen, F. (2010), Principles of Corporate Finance, 10th edition, McGraw-Hill Education, pages 222: “A production facility with high fixed costs, relative to variable costs, is said to have high operating leverage. High operating leverage means a high asset beta.”

⁸⁸ Competition Commission, 8 February 2010. [Bristol Water plc - A reference under section 12\(3\)\(a\) of the Water Industry Act 1991](#). Annex N, table 8, N36.

⁸⁹ Competition and Markets Authority, 6 October 2015. [Bristol Water plc - A reference under section 12\(3\)\(a\) of the Water Industry Act 1991](#). paragraph 10.162.

⁹⁰ The CC considered metrics such as operating cash flow as a % of revenue, totex [total expenditure] to average Regulatory Capital Value (RCV), revenue to average RCV, wholesale totex to wholesale RCV and wholesale revenue to wholesale RCV.

FTTP has higher operating leverage than FTTC

A6.85 We have considered the operating leverage for FTTP relative to FTTC. Openreach is at the start of its FTTP investment, and the majority of the fixed costs associated with rollout are yet to be incurred. Investors in FTTP face greater systematic risk from investing in FTTP because the expectation of incurring high fixed costs exposes their expected return to greater cyclical risk.

A6.86 In particular, BT has an ambition to cover 20m premises with FTTP by the mid to late 2020s, if the conditions are right. Investors in BT are therefore likely to take account of the systematic risk associated with investing in FTTP at scale. We therefore believe Ofcom should consider the relative fixed costs of FTTP relative to FTTC and copper, and the impact it has on systematic risk.

A6.87 Given Openreach is at the start of its FTTP investment, a long historical time series comparing the cost structure of FTTP and FTTC is not available. However, the absence of such historical evidence means Ofcom should consider forecasts of FTTP and FTTC cost structures to quantify any beta adjustment for operating leverage. Whilst Ofcom considers the total forecast capex required for nationwide FTTP rollout,⁹¹ it does not consider the forecast capex associated with BT's investment in FTTP.

A6.88 We have estimated forecast FTTP and FTTC/copper costs based on an indicative tranche of FTTP investment by BT. This model forecasts different types of costs by service and allows a comparison of fixed cost to total cost for FTTP and FTTC/copper.⁹²

A6.89 Using these cost projections, we calculate the forward-looking operating leverage for FTTP and FTTC/copper based on the average of three alternative approaches:

Present Value approach:

$$OL_{PV \text{ approach}} = \frac{\sum_{t=0}^T PV(\text{fixed cost}_t)}{\sum_{t=0}^T (PV(\text{fixed cost}_t) + PV(\text{variable cost}_t))}$$

Simple average:

$$OL_{\text{simple average}} = \frac{1}{T} \sum_{t=0}^T \frac{(\text{fixed cost}_t)}{(\text{fixed cost}_t) + (\text{variable cost}_t)}$$

Mean capital employed (MCE) weighted

$$OL_{\text{MCE weighted}} = \sum_{t=0}^T \frac{1}{\gamma_t} \frac{(\text{fixed cost}_t)}{(\text{fixed cost}_t) + (\text{variable cost}_t)}$$

Where each year's OL is weighted: $\gamma_t = \frac{(MCE_t)}{\sum_{t=0}^T (MCE_t)}$

A6.90 Table A6.6 presents the forward-looking operating leverage for FTTP and FTTC/copper under each of the above approaches. Across all three measures, the forward-looking operating leverage for FTTP is substantially higher than that for FTTC.

⁹¹ WFTMR 2020, Annex 21, paragraph A21.49.

⁹² We categorise capex and provisions as fixed costs and direct opex and indirect opex as variable costs. Our analysis projects costs from 2021/22 to 2040/41. Our analysis was undertaken in March 2020 and updates to the analysis are likely in the coming months.

Table A6.6 – Operating Leverage for FTTP compared to FTTC/copper

	Present Value approach	Simple average	MCE weighted	Average
FTTP	[X]	[X]	[X]	[X]
FTTC/Copper	[X]	[X]	[X]	[X]

Source: BT FTTP financial model

A6.91 We believe the evidence above on operating leverage provides a strong empirical basis for justifying a higher asset beta for FTTP than for FTTC. We now discuss how such an asset beta uplift might be quantified.

Quantifying the operating leverage uplift

The relationship between fixed costs, total costs and the asset beta

A6.92 We have adopted an approach to estimating the FTTC asset beta by adjusting for a factor that reflects the higher operating leverage of FTTP.

A6.93 We start with the following two relationships:

$$\text{Cash Flow} = \text{Revenue} - \text{Fixed Cost} - \text{Variable Cost} \quad [\text{Equation 1}]$$

$$\text{Value of the Asset} = \text{Present Value (PV) of Cash Flows} \quad [\text{Equation 2}]$$

A6.94 The operating leverage of a firm (or project) is the proportion of its total costs that are fixed and independent of volumes. To show the link between operating leverage and the asset beta, first consider that the value of an asset can be defined as follows (by combining equations 1 and 2):

$$PV(\text{asset}) = PV(\text{revenue}) - PV(\text{fixed cost}) - PV(\text{variable cost})$$

Or rearranged to

$$PV(\text{revenue}) = PV(\text{asset}) + PV(\text{fixed cost}) + PV(\text{variable cost})$$

A6.95 The equation above can be reformulated in terms of the betas for each component, recognising that the revenue beta is a weighted average of the betas of the components:

$$\beta_{\text{revenue}} = \beta_{\text{asset}} \frac{PV(\text{asset})}{PV(\text{revenue})} + \beta_{\text{fixed cost}} \frac{PV(\text{fixed cost})}{PV(\text{revenue})} + \beta_{\text{variable cost}} \frac{PV(\text{variable cost})}{PV(\text{revenue})}$$

A6.96 The beta of fixed costs is approximately zero, because they have little (if any) relationship to market conditions. The beta of revenues and variable costs are assumed to be around equal, given that we would expect them to have similar volume drivers. The above equation can then be rearranged to:⁹³

$$\beta_{\text{asset}} = \beta_{\text{revenue}} * \left[1 + \frac{PV(\text{fixed cost})}{PV(\text{asset})} \right] \quad [\text{Equation 3}]$$

A6.97 Equation 3 represents the standard result that for, the same revenue beta, a project which has a higher proportion of fixed costs will have a higher asset beta.

⁹³ The equation is found in Brealey, R.A., Myers, S.C. and Allen, F. (2010), Principles of Corporate Finance (10th edition), McGraw-Hill Education, page 223. The theory takes the value of an asset (revenues less costs) and identifies asset risk as a weighted average of the systematic risk of revenue and costs. Degree of operating leverage (DOL), defined as $DOL = [1 + (\text{fixed costs}/\text{profits})]$. DOL measures the percentage change in profits for a 1% change in revenue. We have derived here a version of DOL expressed in PVs and betas.

Estimating the revenue beta for FTTC

A6.98 We now apply Equation 3 above to calculate the β_{revenue} for FTTC. We assume that β_{asset} is 0.65, based on our assumption for FTTC. We can also calculate PV (fixed cost) and PV (asset) for FTTC from the indicative FTTP investment tranche to estimate the degree of operating leverage for FTTC.

A6.99 The degree of operating leverage for FTTC is then [X],⁹⁴ and so we estimate that the β_{revenue} for FTTC is [X].

Applying FTTP operating leverage to calculate the FTTP asset beta

A6.100 In order to estimate the asset beta for FTTP, we calculate what the FTTC cost structure would need to be for the FTTC operating leverage to match that of FTTP. In other words, we derive the PV(fixed cost) for FTTC (i.e. the last term in Equation 3), so that FTTC has the same operating leverage as FTTP. In doing this we assume that the PV(asset) is unchanged from that for FTTC and total costs for FTTC are unchanged.

A6.101 Based on the above method, we derive PV(fixed cost) for FTTC and then recalculate the operating leverage for FTTC.⁹⁵

A6.102 Using this new estimate of the operating leverage, we apply Equation 3 using β_{revenue} for FTTC of 0.65. This is a conservative assumption because demand risk for FTTP is currently higher than for FTTC because it is viewed as a premium product. Applying Equation 3 using the new estimate of the operating leverage and the β_{revenue} for FTTC provides an implied asset beta of [X] for FTTP.

A6.103 Our calculation of the operating leverage adjustment is summarised in Table A6.7, which sets out the assumptions in each of the steps described above.

⁹⁴ [X], the degree of operating leverage (equal to $1 + \text{PV}(\text{fixed cost}) / \text{PV}(\text{asset})$) is equal to [X].

⁹⁵ Note that the FTTC asset beta is adjusted using the operating leverage of FTTP, rather than the *degree* of operating leverage. Applying the degree of operating leverage for FTTP to the FTTC cost structure would give an even higher estimate of the FTTP asset beta.

Table A6.7 – Steps in estimating the operating leverage adjustment to the asset beta for FTTP

	Ref	FTTC	FTTC + Copper	Notes
Asset beta	[A]	0.65	0.61*	Based on BT's view of WACC categorisation, and Ofcom beta estimates for individual categories
PV(Fixed cost) (£bn)	[B]	[X]	[X]	Input from BT financial model
PV(Total cost) (£bn)	[C]	[X]	[X]	Input from BT financial model
PV(Asset) (£bn)	[D]	[X]	[X]	Input from BT financial model
Actual degree of operating leverage	[E] = $1 + [B]/[D]$	[X]	[X]	Calculation
Revenue beta	[F] = $[A]/[E]$	[X]	[X]	Calculation
Target (FTTP) operating leverage	[G]	[X]	[X]	Input from BT financial model
Actual operating leverage	[H] = $[B]/[C]$	[X]	[X]	Calculation
Adjusted degree of operating leverage	[I] = $1 + [G]*[C]/[D]$	[X]	[X]	Calculation
Adjusted asset beta for FTTP	[J] = $[F]*[I]$	[X]	[X]	Calculation
Average asset beta for FTTP	[K] = Average [J]	[X]	[X]	Calculation

Notes: *Average of free cash flow, revenue and mean capital employed weighted average asset beta for FTTC and Copper combined.

A6.104 The estimated asset beta for FTTP effectively adjusts the asset beta for FTTC to reflect higher operating leverage for FTTP. It does not reflect any higher demand risk for FTTP relative to FTTC because we assume the β_{revenue} is the same for both services.

A7. BT Core

21 core nodes

- A7.1 BT welcomes Ofcom's proposal to reinstate an exemption in respect of 21 core nodes within BT's core network from Openreach's Equivalence of Inputs (EOI) obligations from April 2021.⁹⁶ Ofcom's proposal will ensure BT can continue to make long-term investments in core network services to deliver the capacity and reliability our customers and end consumers demand including in relation to the provision of critical national infrastructure.
- A7.2 Traffic on our core network is growing at [X] driven by increasing retail demand for bandwidth across fixed and wireless services. To meet this increase in traffic growth we must continually upgrade capacity across all nodes within our core network.
- A7.3 BT's current core network is located in 106 exchanges. This has remained stable over the past 15 years and is likely to remain so although we note that future changes in traffic patterns, the process of integrating BT core nodes and former EE core nodes and wider drivers of network convergence could potentially change the number BT node sites and trunk pathways in the future.
- A7.4 BT's core network is built to a high level of network resilience and serviceability which our customers demand and is appropriate for providing critical national infrastructure. This includes providing multiple [X] diverse paths to different regions of the country. By investing in capacity to manage traffic growth across the entire core we ensure traffic growth and service resilience is not impacted by long term failures – such as cable breaks or failure of entire buildings due to, for example, loss of power from flood or other severe weather events.
- A7.5 We also invest in resilience and capacity to ensure our core network can support critical national infrastructure during periods of exceptional traffic demand including in relation to COVID-19. This requires significant continued investment at all core nodes including those which are located for geographical diversity and regional connectivity rather than close to large populations of customers or other network providers.
- A7.6 Historically, Ofcom has recognised that it would be inappropriate to place an EOI obligation on BT in respect of connections which form part of BT's core network. This was because Ofcom considered that core networks, including trunk segments between core nodes, are provided by many Principal Core Operators (PCOs) and are therefore competitive. Reflecting this, Ofcom provided for exemptions from BT's EOI obligation. The exemption was intended to enable investment in resilience and capacity using bespoke solutions and processes. This is still entirely appropriate today given the competitive nature of core networks. We therefore support the re-adoption of this previous policy in Ofcom's WFTMR proposals, noting it would also ensure consistent regulation.⁹⁷
- A7.7 Against that background, the locations of nodes and circuits that make up BT's core network have remained largely the same over the last 15 years. BT has invested significantly in resilience and capacity and has developed its plans for the core

⁹⁶ WFTMR 2020, Volume 3, paragraphs 3.63 to 3.69.

⁹⁷ We note in this context that Ofcom's market definition in the interexchange (IEX) market assumes that CPs require access to any and all BT exchanges with less than 2 PCOs present to be able to compete in WLA and LLA markets, for which Ofcom has not sufficiently made the case.

network on the expectation that the regulatory framework and, specifically, the EOI exemption, would continue to provide appropriate flexibility to design and build a competitive core network.

- A7.8 In its 2019 BCMR Statement, Ofcom removed the broad exemption from EOI for connections forming part of BT's core network, replacing it with a much narrower retrospective exemption. Ofcom stated that BT would only be exempt from the EOI obligation at otherwise regulated exchanges in respect of "*network access that it was providing, but which it was not required to provide on an EOI basis, as at 30 March 2019*".⁹⁸
- A7.9 As a result, for the first time and as of 30 March 2019, any new fibre circuits to and from 21 of BT's core nodes became subject to an EOI obligation. While BT can continue to add capacity to pre-existing circuits, this offers limited benefit given the [BT ✕] increase in traffic demand. 10 of these nodes became subject to regulation as a result of the narrower EOI exemption. 11 of these nodes became regulated merely as a result of the new approach that Ofcom took to market definition for trunk (core and backhaul) segments in the 2019 BCMR. None of these nodes are subject to regulation due to any change in the competitive conditions of core connectivity in the UK as we set out in our presentation to Ofcom on 1 October 2019.⁹⁹
- A7.10 Subsequent to the publication of the 2019 BCMR Statement we explained to Ofcom the unintended costs that would likely arise with the removal of the EOI exemption from 21 of BT's 106 core nodes.¹⁰⁰ We provided Ofcom with detailed estimates of costs for three options to upgrade core network capacity in light of Ofcom's decision.¹⁰¹
- A7.11 We also explained to Ofcom that without the measures we are requesting below, we did not have a viable option available to us to continue to grow or maintain our core capacity without it negatively impacting network requirements critical to the resilience of our network (such as separacy).¹⁰² To ensure our ability to continue to grow and maintain our core capacity without a negative impact, we indicated that Ofcom should revert to its established regulatory approach, i.e.:
- i. Return the full EOI exemption to the 11 nodes where it was removed
 - ii. Deregulate or provide a full EOI exemption to the 10 nodes that were re-regulated.
- A7.12 In light of these submissions (and the supporting evidence), we support Ofcom's proposal to reinstate an exemption in respect of 21 core nodes within BT's core network from BT's EOI obligations. In addition, we agree the draft Legal Instrument does reflect the policy intent outlined at paragraphs 3.63 to 3.71 of the WFTMR Consultation at Condition 5.4.(c) and 5.9.
- A7.13 We note there are a few errors and omissions in the draft Legal Instrument. We suggest how Ofcom can correct these below. We note these omissions and errors are separate to Conditions 5.4(c) and 5.9 and therefore do not undermine Ofcom's overall policy intent but nonetheless could cause confusion unless corrected.

⁹⁸ Ofcom, 28 June 2019. [Promoting competition and investment in fibre networks: review of the physical infrastructure and business connectivity markets](#). Volume 2, paragraph 11.60, page 229.

⁹⁹ [✕] In particular, we refer Ofcom to our market definition analysis in that presentation in slides 4 to 8.

¹⁰⁰ [✕]

¹⁰¹ [✕]

¹⁰² We have regulatory obligations to protect network availability, deriving from the Communications Act s105A, 105B; General Conditions A.3; and the NIS Regulations 2018 (implementing the Networks & Information Systems Directive).

A7.14 The file 'schedule-4-iec-exchanges-by-market (1).xlsx' lists 84 BT core nodes. There are 106 BT core nodes. To avoid future confusion, we propose that Ofcom should make the following changes to the Legal Instrument so that it includes the correct list of 106 BT core nodes.

Corrections to exchanges currently listed in Ofcom's proposals

A7.15 Changes are suggested to two of the buildings within the current (incomplete) list of 84 core nodes.¹⁰³

Table A7.1 – Corrections to exchanges

Information to be deleted:			Information to replace it:			Rationale:
MDF ID	Exchange name	Postcode	MDF ID	Exchange name	Postcode	
EATRU	CAMBRIDGE 'D' TRS	CB2 1PY	EATR/NON	CAMBRIDGE TRUNKS (NORTH)	CB2 8HG	The Cambridge building listed is not the core node.
CLWOO	BAYNARD HOUSE	EC4V 5BT	CLFAR	FARADAY BUILDINGS	EC4V 5BT	Baynard House is incorrectly listed as a core node. The core node is in Faraday House which is nearby. This has probably arisen due to co-located MDFs as documented within the FTMR

Omissions from the core nodes listed in Ofcom's proposals

A7.16 There are 21 core nodes which are missing from the WFTMR.¹⁰⁴ As an observation these all appeared in Schedule 20 (List of Core Nodes) in the 2017 Temporary BCMR.

A7.17 Ofcom should add the following core nodes to the list of core nodes set out in Schedule 4 to the Legal Instrument.

¹⁰³ WFTMR 2020, Vol. 5, Legal Instruments, Schedule 4, Excel file can be found at the following link: <https://www.ofcom.org.uk/consultations-and-statements/category-1/2021-26-wholesale-fixed-telecoms-market-review>

¹⁰⁴ WFTMR 2020, Vol. 5, Legal Instruments, Schedule 4.

Table A7.2 – Core nodes to be added

MDF ID	Exchange name	Postcode
NDASF	ASHFORD ATE	TN23 1LA
WNAE	ABERYSTWYTH ATE AND TRS	SY23 1NH
SMBF	BEDFORD ATE AMC	MK40 1BA
WNBG	BANGOR ATE/TRS	LL57 2UR
STBNMTH	BOURNEMOUTH ATE	BH1 2NR
SMHH	HEMEL HEMPSTEAD ATE	HP3 9EB
WWBWAT	BRIDGWATER TE	TA6 3NA
ESMAI	CENTRAL TE	DD1 1BA
NSIMD	INVERNESS TE EXTN	IV1 1BA
SLLI	LINCOLN ATE	LN2 5AA
EANCC	NORWICH ATE HOWARD HOUSE	NR2 4TP
MYPON	PONTEFRACT ATE & TRS	WF8 1NB
NIPO	PORTADOWN TE	BT63 5AX
WWPYTH	PLYMOUTH TE (STANBURY HOUSE)	PL1 1BQ
EASND	SOUTHEND MAIN T E	SS0 7BT
SWSX	SWANSEA CENTRAL A.T.E./T.R.S.	SA1 2AW
WNSY	SHREWSBURY ATE & TRS	SY1 1TY
WWTRUR	TRURO TE (NEW BUILDING)	TR1 2JQ
NDTWE	TUNBRIDGE WELLS SOUTH TRS	TN4 9TX
WNWX	WREXHAM ATE	LL11 1BU
WWYEOV	YEOVIL TE/TRS/MTW/SO	BA20 1AD

A7.18 There is one additional omission from the list of core nodes – Telephone House Belfast (Belfast Seymour).¹⁰⁵ Unlike the other 21 omissions listed in Part 1 it is not listed in Schedule 20 (List of Core Nodes) in the 2017 Temporary BCMR. Ofcom should add the following to the issued list.

Table A7.3 – Core node to be added

MDF ID	Exchange name	Postcode
NISEY	TELEPHONE HOUSE BELFAST	BT1 4NB

¹⁰⁵ WFTMR 2020, Vol. 5, legal Instruments, Schedule 4.

Former EE core nodes

A7.19 Ofcom states the following: “We propose to define a single market for IEC services which: a) includes active services at all bandwidths provided between BT exchanges; b) includes dark fibre between BT exchanges; c) excludes LL Access services; and d) excludes all trunk services that do not connect between BT exchanges [emphasis added].”¹⁰⁶

A7.1 Ofcom clarifies the distinction between trunk segments and routes in the IEC market in Table A6.12. The table sets out that any traffic carried from BT exchanges to telecoms provider network are trunk segments. Consistent with this definition, we consider that trunk lines built out to former EE core nodes (which are not co-located at BT exchange buildings) fall into the category of ‘trunk segments’ and are therefore outside the IEC product market and the scope of regulation.

A7.2 To provide for maximum regulatory certainty BT asks Ofcom to list the previous EE core nodes as outside the IEC product market and out of scope of EOI regulation similar to Schedule 20 of the Legal Instrument in the 2017 temporary BCMR.¹⁰⁷ ¹⁰⁸ This is important because BT may wish to augment the capacity of its core network by building out to these sites and should be able to do without regulatory constraint given competition in trunk segments.

Other sites

A7.3 In addition to the former 18 EE core nodes, BT uses in its network a small number of other operational buildings which do not contain a copper MDF and are not listed as part of the IEC market in Schedule 4 of the FTMR. These include:

- Satellite Earth stations (Madley)
- Subsea cable landing stations (Budehaven TRS, Land's End TRS, Portpatrick TRS, Ainsdale TRS)
- Switching nodes (Reading Trunk, London Ealing SSC, London Wood Green SSC, Edinburgh Capital, Newcastle Hadrian, Clyde Valley, Leicester Humberstone Road)
- Interconnect Points (Hull Anson House)

A7.4 Referring to Table A6.12 set out above, BT understands that these buildings are not exchange sites and that connections to them are trunk segments and are outside the inter-exchange connectivity services market, consistent with them not being listed in Schedule 4 of the proposed Legal Instrument.

A7.5 To provide for maximum regulatory certainty BT asks Ofcom to make an explicit statement excluding these sites from the IEC product market in its WFTMR Final Statement.

¹⁰⁶ WFTMR 2020, Volume 2, paragraph 6.98.

¹⁰⁷ Ofcom, 23 November 2017. BCMR Imposition of Temporary Conditions and Legal Instruments. See [Temporary Conditions Annex 1, Legal instruments](#), Schedule 20 Core nodes.

¹⁰⁸ [X]

A8. BT downstream arms must be able to compete on a level playing field¹⁰⁹

- A8.1 As set out in chapter 2 of our main response, BT Enterprise competes in an increasingly competitive space for business services. Competition ranges from passive infrastructure providers to fully integrated solutions providers.
- A8.2 Most elements of the value chain are effectively competitive and (rightly) not regulated. Even where Ofcom finds BT still has SMP (in Physical Infrastructure Access (PIA) and Leased Lines Access (LLA) markets), competitive pressure is growing from alternative network providers.
- A8.3 The next market review period will be a time of accelerating change as fibre entrants increase the scale of their investment in new networks. Enabled by the increased focus on regulation upstream into the PI market, they will continue delivering fibre services to businesses in areas of the country that are becoming, or are already, highly competitive.¹¹⁰
- A8.4 Given these increasing competitive pressures, the case for BT Enterprise using Openreach's Duct and Pole Access (DPA) product, and potentially Dark Fibre (DF) in Area 3, is becoming stronger. Further, in order to efficiently use DPA, BT Enterprise will need to build a limited amount of its own duct primarily at the edges of the network. BT Enterprise needs to do this in order to remain competitive in a market where large competitive tenders are fought hard on price, and where DPA provides a clear cost advantage over active access products.
- A8.5 The *ex ante* regime should permit BT Enterprise enough flexibility to compete fairly downstream in this environment: the restrictions on BT Enterprise's use of Openreach passives as currently envisaged are disproportionate and deny BT Enterprise the regulatory certainty it needs to move at pace and make investment decisions in bid-driven business markets.
- A8.6 Unlike other providers, where BT Enterprise seeks to use Openreach's DPA or DF inputs, or in limited cases build duct to make effective use of DPA, it is currently constrained by SMP regulation¹¹¹. Although the products and services to which the SMP finding relates are Openreach products and services, the SMP obligation applies across the whole of BT Group and therefore covers Enterprise, preventing it from competing on a level playing field with other CPs. The SMP obligation compels BT Enterprise, upon request, to make available any services it creates on the basis of DPA or DF on regulated terms if they meet the definition of the LLA, WLA or IEC markets in which Openreach has SMP.
- A8.7 The application of SMP conditions to 'business-grade' services (as defined by Ofcom) created by BT Enterprise on the basis of DPA and DF, and to associated new duct build, would deny BT Enterprise the ability to use DPA and DF in the same manner as its competitors.¹¹² It prevents BT Enterprise from competing fairly on a level playing field in

¹⁰⁹ This chapter of the Annex has been submitted on 12 June 2020.

¹¹⁰ As set out in chapter 2 of the main response, paragraphs 2.6-7

¹¹¹ Moreover, Enterprise's pricing freedom, when using Openreach inputs, is also constrained relative to competitors due to the Commitments and competition law requirements to comply with a margin squeeze test.

¹¹² By business-grade services we mean 1) those products in the WLA markets targeted at business users, which typically offer a range of additional features (compared with residential broadband products) such as increased customer support and higher service standards, and which may also be tailored to the needs of different types and

markets which are downstream of the Physical Infrastructure (PI) market. The SMP conditions unnecessarily reduce BT Enterprise's incentives to invest in innovative, differentiated solutions that are tailored to customers' needs at competitive prices, thereby distorting competition in the market, which is ultimately detrimental to end customers' interests.

A8.8 We therefore request that Ofcom explicitly sets out in the final Statement that SMP conditions would not attach to business-grade services provided by BT Enterprise on the basis of its use of DPA and DF, nor to infrastructure BT Enterprise creates that is necessary to make use of DPA.¹¹³ ¹¹⁴ Ofcom has in fact previously exempted BT downstream from *ex ante* SMP conditions on products created using an upstream passive input.¹¹⁵

A8.9 An SMP exemption would enable fair competition in markets downstream of DPA and DF, and avoid negative and presumably unintended consequences from unnecessary SMP regulation. As we will go on to discuss in more detail in the sections below, there is also no risk that such exemptions would undermine the effectiveness of the SMP regulation imposed by Ofcom on Openreach in the PI, LLA and WLA markets.¹¹⁶

A8.10 The remainder of this Annex addresses the following issues:

- a. SMP regulation should not apply to business-grade services **supplied by BT Enterprise using Openreach's regulated DPA and DF products.**¹¹⁷
- b. SMP regulation should not apply to **duct built and operated/managed by BT Enterprise where this is necessary to make effective use of the DPA remedy.**

size of organisation; and 2) in the LLA market, leased lines providing users with high quality business connectivity services. Ofcom WFTMR, Volume 2, 2.4 & 2.71.

¹¹³ BT Enterprise may at some point consider purchasing passive inputs from Altnets in order to create services in downstream markets. Since BT would be purchasing upstream network inputs from a third-party provider without a dominant market position, we do not believe SMP obligations should apply to downstream fibre products created using these inputs. We may wish to discuss this matter in more detail with Ofcom in the future.

¹¹⁴ Although we are currently only seeking an exemption from SMP conditions for business-grade services provided by BT Enterprise on the basis of its use of DPA and DF, BT may consider, at some point in the future, using the fibre we pass to sell services such as FTTP directly to residential customers in limited circumstances. We may wish to discuss this matter in more detail with Ofcom in the future but it is not included as part of the current request.

¹¹⁵ This exemption is set out in more detail in paragraphs A.35-36 below.

¹¹⁶ As set out in chapter 4 of the main response, paragraphs 4.68-75, we expect Ofcom to give weight to the Commitments when considering the extent to which there is a competition problem and the proportionality of applying an SMP remedy. The Commitments enshrine Openreach's separation from BT and the protection they offer should give Ofcom greater confidence in allowing downstream BT Enterprise to have the same commercial flexibility as rival CPs in respect of their network supply options.

¹¹⁷ This means it would not apply to such services provided in the Leased Lines Access, Wholesale Local Access or Inter-Exchange Connectivity markets.

SMP regulation should not apply to BT Enterprise's products based on DPA or DF

Enterprise is caught by SMP regulation in markets downstream of PI whenever it uses DPA or DF remedies

- A8.11 The SMP conditions in the markets for Physical Infrastructure (PI), Wholesale Local Access (WLA), Leased Lines Access (LLA) and Interexchange Connectivity (IEC) are applied to products provided by Openreach. However, the subject of the SMP regulation is BT Plc. As such, if any other part of BT provides products that fall within the scope of markets in which Openreach is found to have SMP, it would be legally bound by the same SMP conditions.
- A8.12 BT business units downstream of Openreach do not generally provide products that fall into the regulated PI, WLA, LLA or IEC markets in competition with Openreach's regulated products.
- A8.13 However, when using DPA, BT Enterprise would lay its own fibre cables in duct made available by OR. Over these fibre cables, BT Enterprise would then "self-supply" or create services that it might have otherwise purchased from Openreach. Where those services meet the product market definition for any of the regulated markets for LLA, WLA or IEC, BT Enterprise would also have to make available these services on regulated terms to third parties.
- A8.14 Similarly, when Enterprise uses DF, an active service over that dark fibre could meet the definition of an LLA, WLA or IEC service¹¹⁸. As Ofcom is proposing to impose SMP obligations in these markets on BT Plc, BT Enterprise may also have to make available such services on regulated terms to third parties.
- A8.15 As explained below, these SMP obligations would prevent BT Enterprise from competing on a level playing field.

BT Enterprise possesses no inherent advantages when using DPA or DF – in fact it needs the ability to use DPA in the same manner as other CPs to remain competitive

- A8.16 The DPA and DF remedies available through Openreach are intended to drive greater competitive pressure downstream of the PI market. When using DPA or DF, BT Enterprise would not possess any inherent advantages *vis-a-vis* competitors in any of the regulated markets that are downstream of the PI market.
- A8.17 We note that all CPs have equal access to DPA and DF products - DPA is available to all CPs on a non-discriminatory basis, and the regulated DF product is proposed to be made available to all CPs on EoI and No Undue Discrimination terms. In addition, rival CPs can also use regulated active products from Openreach.
- A8.18 Moreover, the legal separation of Openreach from the rest of BT and the provisions contained in the Commitments respectively ensure that downstream BT is held at arm's

¹¹⁸ Ofcom is proposing to introduce dark fibre as a remedy in Area 3 for LLA services and to maintain the existing requirement for a dark fibre product in BT Only Exchanges for IEC services.

length from Openreach and that Openreach treats all customers, including BT Enterprise, equally.¹¹⁹

A8.19 As BT Enterprise does not have inherent advantages over other CPs when using DPA/DF, the application of SMP regulation to services it supplies in downstream markets from using these remedies is not necessary or proportionate.

A8.20 BT Enterprise needs the ability to use DPA in the same manner as other CPs to compete effectively. We set out below how other CPs are making use of PI remedies to reduce their costs and drive greater competition in downstream markets. In the following section, we highlight the negative impact of SMP regulations on BT Enterprise's ability to compete on a level playing field in downstream markets.

A8.21 Other CPs are leveraging the cost advantages offered by DPA to build their own networks where it is more economic compared to the use of Openreach's active LLA products.

A8.22 This is leading to greater competitive pressures in all markets downstream of the PI market and a trend towards 'mix and match' bids in which the access connection is separated from other services. This is demonstrated by the following:

- DPA has clear cost advantages over the use of active access products in some cases. In particular, in areas with a high business and/or population density (where the cost of DPA and the fibre investment can be spread over multiple customers) and for shorter distance circuits (since the cost of DPA varies with distance whereas the cost for Openreach's active leased lines access products generally does not).
- Ofcom's own assessment of the magnitude of the cost saving found that the use of DPA lowers upfront build costs by approximately half.¹²⁰ A study by AlixPartners for BT found that the use of DPA increases the radius within which network build is commercially viable by a factor of ten and concludes that the availability of DPA will "constrain Openreach" by allowing "CPs to deploy ... fibre more cheaply, rapidly and in more locations" than without the remedy.¹²¹
- Ofcom presented evidence that DPA take up was likely to contribute to greater competition in LLA markets. It suggested "*there are prospects of material network build, including that based on PIA, for [...] LL Access services in the CLA, HNR areas and Area 2*".¹²² For example, in the HNR areas, Ofcom expects the use of DPA to contribute to the market potentially becoming effectively competitive in the future.^{123,124}
- The market downstream of PI is changing and becoming more dynamic: CPs blend their network build, using DPA and actives. Customers, including those in the public sector, are moving towards fragmented connectivity models where access connections and services are procured separately (e.g. LFFN bids). In the mobile backhaul space, MNOs' requests for proposal

¹¹⁹ Commitments of BT Plc and Openreach Limited to Ofcom, Section 5 'Equal Treatment of Customers'

¹²⁰ WFTMR 2020, Volume 1, page 4 and WFTMR 2020, Volume 2, paragraph 1.28.

¹²¹ As set out in chapter 2 of the main response, paragraphs 2.101-102

¹²² Ofcom WFTMR, Annex 7, A7.2

¹²³ Ofcom WFTMR, Volume 2, 8.102/103.

¹²⁴ As set out in chapter 2 of the main response, we consider that the HNR areas are already today effectively competitive and should be deregulated.

(RFPs) specify that site kit, access connections, backhaul and core should be separate components.

A8.23 Moreover, there is already evidence of significant activity based on DPA. Ofcom reports that 80 companies are looking to use Openreach's telegraph poles and underground ducts to lay new fibre and planning to use over 40,000 poles and 5,000km of duct, up from around 12,000 and 2,500km in May 2019.² CityFibre has also stated that it expects to be the largest DPA customer in the UK.³

A8.24 In addition, DPA enables new ways of network planning and new business models, which are driving greater competitive pressure in markets downstream of PI. For example, DPA is used by large alternative network providers that own significant network infrastructure themselves, including Virgin Media¹²⁵, CityFibre and Hyperoptic¹²⁶. It has enabled new business models, as in the case of Next Gen Access that use DPA as a key component in their business model, creating Dark Fibre which they sell on.¹²⁷

A8.25 The greater competitive pressure in markets downstream of PI, can be seen in the highly valuable mobile backhaul market segment, where provision of mobile backhaul for new 5G services is progressing at pace.

A8.26 Paragraph 2.110 of BT's response describes the highly dynamic and fiercely competitive market conditions in the mobile backhaul segment that has seen a number of recent announcements of strategic partnerships between MNOs and preferred network providers to de-risk their investments and reduce costs. For example, Virgin Media announced long-term backhaul contracts with both Three (for connecting its 5G mobile masts) and Vodafone. In addition, news reports on the merger between Virgin Media and O2 suggest that the joint venture may internalise O2's backhaul requirements (indicating a transfer of share from BT and Openreach to Virgin Media). Virgin Media has clearly identified mobile backhaul as a key growth area and recently described itself as the "backhaul bastion of the UK".¹²⁸

A8.27 In such a market environment it is clear that BT Enterprise does not enjoy advantages over its rival aggregators when it uses DPA to compete in markets downstream of PI. On the contrary, in order to compete on a level playing field in these downstream markets BT Enterprise needs to be able to benefit from the same cost saving options and flexibility as its competitors.

¹²⁵ Virgin Media has used DPA to circumvent structural objects posing additional build challenges, e.g. underneath rail lines or near bridges. ISP Review, 1 April 2019, [Virgin Media UK Start Using Openreach Cable Ducts to Expand Network](#)

¹²⁶ CityFibre and Hyperoptic blend DPA with network build where they are rolling out full fibre to reduce cost and time for deployment. [CityFibre Response to Ofcom consultation on DPA pricing](#), September 2017, p. 7; and [Hyperoptic Response to Consultation on pricing proposals for Duct and Pole Access \(DPA\) remedies](#), September 2017, p. 3, 8

¹²⁷ CPs like Next Gen Access use DPA as a key component in their business model, creating Dark Fibre which they sell on. [Next Gen Access News](#), November 2017.

¹²⁸ Financial Times, 7 May 2020. [Virgin Media to dominate market connecting 5G after contract win](#); and ISP Review, 7 May 2020. [Virgin Media and O2 Agree UK Broadband and Mobile Merger](#).

The application of SMP conditions negatively impact BT Enterprise's incentives to use DPA and thereby hinders its ability to compete on a level playing field

A8.28 We set out above the cost advantages of using DPA for BT Enterprise and wider industry.¹²⁹ Although the guiding principle is that Enterprise will continue to use Openreach active products where these allow it to compete,¹³⁰ DPA is needed for Enterprise to respond to competitive pressures when providing services in specific circumstances e.g. mobile backhaul in areas of high business density and over shorter distance circuits.¹³¹

A8.29 Despite having no inherent advantages over other CPs, the application of SMP regulation to BT Enterprise means that it would be required to make available, on regulated terms, services it creates using Openreach's DPA or DF remedies to other CPs it competes with. This leads to an unlevel playing field, distorts competition in the markets downstream of the PI market for business services and negatively impacts BT Enterprise's incentives to invest in the LLA market and other markets for business-grade connectivity services.

A8.30 The SMP obligations can also have a dampening effect on BT Enterprise's incentives to innovate and differentiate the products it provides using DPA. Having to offer an innovative new service based on DPA to competitors on regulated terms could dampen the business case for such investment. BT Enterprise is hindered in its ability to differentiate itself through the development of innovative, customer-tailored services made possible through DPA, because of the requirement to make these same innovations available to competitors. For example, BT Enterprise investment in architecture different to that typically deployed by Openreach opens up opportunities for 'edge processing' and 'virtualisation' i.e. bringing computation and data storage closer to the location where it is needed.¹³² Reducing the incentive for any market player to innovate and invest has detrimental effects on the market and ultimately customers, who will not benefit from improved services.

A8.31 These negative, and presumably unintended, consequences of SMP regulation can be avoided by explicitly clarifying that the SMP conditions in markets downstream of the PI market do not apply to business grade services that BT Enterprise creates on the basis of DPA or DF. As we go on to explain in the following section, there is no risk that such an exemption would undermine the effectiveness of Ofcom's regulation of the PI and downstream markets to enable effective competition.

Not attaching SMP regulation to BT Enterprise does not undermine the effectiveness of Ofcom's remedies and is consistent with its previous assessment in DF

A8.32 Not applying SMP conditions on BT Enterprise, where it uses DPA or DF to create business-grade services it sells in markets downstream of the PI market, carries no risk of

¹²⁹ See paragraph A.22.

¹³⁰ To avoid asset duplication within BT Group & minimise capex spend.

¹³¹ [REDACTED]

¹³² [REDACTED]

undermining the effectiveness of SMP regulation in promoting and protecting effective competition downstream of the PI market.

A8.33 That the relevant SMP obligations are carried out by Openreach is sufficient to protect against the risk of an exemption for downstream BT undermining those remedies. Rival CPs will continue to be able to access DPA and DF on regulated terms, and therefore on the same basis as Enterprise, allowing them to replicate the services and products that Enterprise creates. Openreach will continue to offer active services while it remains regulated.¹³³ There will also be no impact on Openreach's ability or incentive to offer services and build network as this decision-making is separate to downstream BT's.

A8.34 Indeed, far from undermining Ofcom's remedies, the proposed exemption drives more efficient and effective use of Ofcom's DPA remedy by BT Enterprise. The cost advantages offered by DPA in certain specific scenarios mean that its use by Enterprise adds to competitive pressures in some parts of the markets downstream of the PI market, which in turn offers benefits to consumers in terms of choice and value for money.¹³⁴

A8.35 In addition, not applying SMP conditions to BT Enterprise when using DPA or DF is consistent with the position previously taken by Ofcom in the case of dark fibre, where upstream protections and existing SMP regulations were considered sufficient.¹³⁵

A8.36 Ofcom has previously acknowledged that where BT Downstream uses an upstream passive input (i.e. dark fibre), BT downstream businesses should have the flexibility compete on a level playing field with other Openreach CP customers. In particular, Ofcom stated:

"We do not propose to impose SMP conditions ex ante on products which BT divisions, downstream of Openreach, might provide by using the dark fibre products which Openreach would provide in complying with our proposed Dark Fibre Access remedy, as long as BT fulfils otherwise the SMP conditions we propose in relation to active services. If Openreach were to fulfil all BT's obligations in relation to active services, and BT's downstream divisions were to provide additional active services by consuming regulated dark fibre from Openreach, we consider that our proposal to require BT to provide dark fibre on the basis of Equivalence of Inputs (EOI) should give sufficient assurance that CPs could compete in the provision of these downstream active services on a level playing field."

A8.37 In summary, BT Enterprise's use of DPA or DF does not have the intention, nor can it have the effect, of undermining the effectiveness of the regulated Openreach active services in enabling effective competition in downstream markets. It simply enables BT Enterprise to remain competitive with other CPs that increasingly use alternative input products to Openreach's active leased lines services.¹³⁶

¹³³ Should Ofcom decide to de-regulate Openreach active services, then lack of access to services created by Enterprise cannot be a concern because Ofcom will have identified sufficient competitive choices and options for rivals.

¹³⁴ Paragraphs A.22-25 above sets out how DPA provides significant cost advantages for Enterprise for certain services e.g. mobile backhaul in dense urban areas. To the extent that DPA may be used by Enterprise to provide other services in these areas e.g. business-grade FTTP, Ofcom should not be concerned that an SMP exemption would undermine investment in FTTP roll out: the pattern of its roll out shows that Openreach is seeking to meet consumer rather than business demand.

¹³⁵ [Clarifications and corrections to the Business Connectivity Market Review consultation document of 15 May 2015 and the Leased Lines Charge Controls and Dark Fibre Pricing consultation document of 12 June 2015](#)

¹³⁶ As set out in paragraphs A.16-21 above.

A8.38 We ask that Ofcom makes it clear in the SMP conditions, that the relevant SMP obligations for LLA, WLA and IEC markets do not apply where BT Enterprise creates business-grade products or services that would fall into these markets on the basis of its use of DPA and DF.

SMP regulation in PI market should not apply to infrastructure built and operated by BT Enterprise to enable effective use of DPA remedy

The ability to build new duct at the network edges is necessary to make effective use of the DPA remedy

A8.39 As set out above, although BT Enterprise will continue to use Openreach active products wherever possible, avoiding asset duplication within BT Group, it intends to make use of DPA in certain areas to remain competitive. To make effective use of DPA it is also necessary for Enterprise to build its own new duct, as it is for all CPs using DPA. This may be required where Openreach's duct is currently unavailable or blocked. For example, Openreach duct may not be available to connect to individual customer sites or to other end points in the network, such as mobile micro cells in street furniture. Other CP's using DPA in the same circumstances would be in the same position, i.e. if they were to use DPA, they would need to build ducts themselves.

A8.40 For example, one of the main use cases for DPA currently being considered by Enterprise is the delivery of mobile backhaul solutions. [X] The necessary duct build that Enterprise envisages therefore would occur predominantly at the edges of the network.

BT Enterprise is caught by SMP regulation in the PI market whenever it would build its own duct

A8.41 As set out above in relation to BT Enterprise's use of DPA, the SMP conditions in the market for Physical Infrastructure (PI) are applied to infrastructure that is managed by Openreach. However, the subject of the SMP regulation is BT Plc. As such, if any other part of BT builds and operates infrastructure that falls within the PI market definition, it would be legally bound by the same SMP conditions.

A8.42 BT business units downstream of Openreach do not generally build and operate infrastructure such as duct. However, as described in the previous section, when using DPA, BT Enterprise needs to deploy some duct itself in order to make effective use of the remedy. BT Enterprise would then use this duct to "self-supply" PI services. As the duct could meet the definition of physical infrastructure that comprises the PI product market, BT Enterprise would be required to make available access to its duct on regulated terms to third parties upon request.

BT Enterprise possesses no inherent advantages when building duct in connection with DPA

A8.43 When other CPs consider using DPA on the same regulated terms as Enterprise, they would also consider building new duct at the edges of the network, where necessary to make effective use of DPA, complementary to Openreach duct, where this is

unavailable or blocked. They can also combine this with their own existing networks. In other words, BT Enterprise would build its own duct only in situations where this option is also available to its competitors.

A8.44 In fact, other CPs may be better placed than BT Enterprise to build duct due to BT's network building capability being primarily located in Openreach rather than BT Enterprise. Other CPs that own their own networks have extensive knowledge and expertise in building passive infrastructure, and many are also considering the use of DPA (we set out a number of examples above).¹³⁷

A8.45 In addition, most of BT Enterprise's use of the regulated DPA product is likely to be in dense urban areas, which would fall primarily into the CLA and HNR areas of the LLA market. In these areas, despite national SMP in the upstream PI market, Openreach already faces effective and growing competitive pressure from alternative network access operators.

A8.46 The above demonstrates that BT Enterprise has no inherent advantage over its rivals in its ability to build duct to make effective use of the DPA remedy.

The application of SMP conditions on duct may negatively impact BT Enterprise's incentives to use DPA and thereby hinder its ability to compete on a level playing field and meet customer needs

A8.47 The risk of having to make available access to its duct on regulated terms may have a negative impact on BT Enterprise's business case for duct build and consequently the DPA investment to which the duct build is related. For example, BT Enterprise is considering the productisation of DPA, i.e. creating a fully operationalised DPA-based offering as part of its standard portfolio. Productising DPA would enable BT Enterprise to quickly and effectively respond to bids through the use of DPA, where it is required to compete effectively in fast-paced business markets.

A8.48 The business case for productising DPA could be undermined if investment in new duct cannot be recovered in full before rival CPs are able to access the duct. [X]

A8.49 Where the new duct connects a new site with multiple customer premises that could be served with the duct, BT Enterprise would have to factor in the risk of competitors being able to use its duct on regulated terms without having to fully share in the original investment risk taken by BT Enterprise. [X]¹³⁸ In contrast other CPs can recover the costs of any the duct they build in equivalent circumstances over multiple customers. This prevents BT Enterprise from competing on a level playing field with other CPs.

Not applying SMP regulation to duct built by BT Enterprise in connection with DPA use will not undermine Ofcom's remedies in regulated markets

A8.50 BT Enterprise will build and operate its own duct where that is required to make use of DPA; the DPA will then be used to create fibre that serves as an input into services it

¹³⁷ See paragraph A.23-26 above.

¹³⁸ [X]

sells in markets downstream of the LLA market. Not applying SMP regulations to the duct BT Enterprise builds carries no risk of undermining the effectiveness of the SMP Regulations in promoting and protecting effective competition in the PI market. The SMP regulations that remain in place protect against the risk of SMP remedies being undermined. The SMP exemption requested only applies to duct built by BT Enterprise where it's necessary to make effective use of DPA. As explained above, the scale of duct build is tactical and predominantly at the edges of the network.

A8.51 The PI remedy supports the interests of CPs and ultimately consumers by facilitating access to the infrastructure required to deploy fibre and so promoting greater large-scale network deployment. We therefore accept that BT would continue to be bound by SMP regulations if BT Enterprise were at any point to decide to build duct unconnected to DPA use.

A8.52 Far from undermining Ofcom's remedies, the proposed exemption would drive more efficient and effective use of Ofcom's DPA remedy by BT Enterprise, with associated benefits for customers, as set out above.

A8.53 In addition, BT Enterprise-created passive infrastructure would be covered by the ATI regulations. We note that existing Access to Infrastructure (ATI) regulations¹³⁹ oblige the owners of any suitable passive infrastructure to consider reasonable requests for access to their infrastructure for the purpose of providing next generation telecommunications infrastructure.

A8.54 We would be willing to keep a separate asset register for BT Enterprise's duct build to give Ofcom additional reassurance that it was associated with DPA.

A8.55 In summary, we request Ofcom to clarify in both the Statement and the SMP Conditions for the PI market that those conditions do not apply to BT Enterprise for duct built in connection with making use of the DPA remedy.

A8.56 We believe this would put BT Enterprise on a level playing field with other CPs, thereby avoiding disproportionate regulation. It carries no real risk of undermining the effectiveness of the effectiveness of the remedies applied in the PI and LLA markets.

¹³⁹ Communications (Access to Infrastructure) Regulations. The ATI Regulations transpose into UK law the Broadband Cost Reduction Directive 2014.

A9. Our responses to Ofcom's consultation questions

Table A9.1 – References to our responses to the consultation questions in WFTMR 2020, Volume 2

Question	Reference
2.1: Do you agree with our description of retail markets? Please set out your reasons and supporting evidence for your response.	<p>No. While retail telecoms markets have been competitive for many years, we are now seeing more intense end to end infrastructure competition (based on a combination of self-build and build reliant on our ducts and poles). This has created effective direct competitive constraints at the wholesale level and has led to fixed markets looking more like the mobile sector where network operators compete to supply commercial network access to retailers under long-term agreements. Ofcom has not recognised these game-changing developments. Ofcom also has not recognised that competition at the retail level creates a strong indirect constraint on wholesale prices as Openreach needs to ensure that the CPs it supplies are competitive vis-à-vis Virgin Media, which has by far the largest ultrafast capable network today and is likely to remain so in the upcoming review period.</p> <p>For our full response see our Main Response section 2.</p>
3.1: Do you agree with our provisional conclusion on physical infrastructure product market definition? Please set out your reasons and supporting evidence for your response.	See Annex 4 above.
4.1: Do you agree with our provisional conclusion on physical infrastructure geographic market definition? Please set out your reasons and supporting evidence for your response.	See Annex 4 above.
4.2: Do you agree with our provisional conclusion on the application of the three criteria test to the physical infrastructure market? Please set out your reasons and supporting evidence for your response.	See Annex 4 above.
5.1: Do you agree with our provisional finding on SMP and resultant competition concerns in the physical infrastructure market? Please set out your	See Annex 4 above.

Question	Reference
reasons and supporting evidence for your response.	
6.1: Do you agree with our provisional conclusions on product market definition for wholesale networks? Please set out your reasons and supporting evidence for your response.	<p><u>WLA services</u> No. There are reasonable grounds for distinguishing wholesale product markets by speed and in particular for testing a break at higher bandwidths where the choice of supply side substitutes becomes more limited above bandwidths of 80Mbps.</p> <p><u>WLA and LL services</u> We agree that WLA and LLA services are in separate markets. See chapter 2 in our Main Response.</p>
7.1: Do you agree with our provisional conclusions on geographic market definition for wholesale networks? Please set out your reasons and supporting evidence for your response.	<p><u>WLA services</u> No, there are strong grounds for distinguishing the Virgin Media footprint as a separate geographic market.</p> <p><u>LLA services</u> No, Ofcom should refresh the data underlying its LLA geographic market definition prior to concluding on the geographic boundaries of HNR area in particular.</p> <p>See chapter 2 in our Main Response.</p>
7.2: Do you agree with our provisional conclusion on the application of the three criteria test to the wholesale inter-exchange connectivity market? Please set out your reasons and supporting evidence for your response.	<p>While we agree that circuits between BT+2 exchanges are likely to be competitively provided, we do not agree that all CPs require access to any and all BT exchanges with less than 2 PCOs present, nor that BT has SMP in relation to each and every connection between them.</p>
8.1: Do you agree with our provisional SMP findings and resultant competition concerns for wholesale networks? Please set out your reasons and supporting evidence for your response.	<p><u>WLA services</u> No. Openreach does not have SMP in ultrafast capable lines nationally nor forward-looking SMP at any speeds in Virgin Media areas.</p> <p><u>LLA services</u> No, as set out in chapter 2 of our Main Response, indicates that the metropolitan areas (referred to as High Network Reach or HNR) are effectively competitive today, while Area 2 may well be found to be effectively competitive on a forward-looking basis once Ofcom updates its analysis and appropriately considers the viability and impact of DPA on the LLA market and in particular the market segment characterised by competitive tendering.</p> <p>As a result, we are concerned that Ofcom is proposing restrictions on Openreach's commercial flexibility unnecessarily (geographic pricing restrictions in Areas 2 and 3 and a notification regime for 'other commercial terms' everywhere except in the CLA).</p>
9.1: Do you agree with our proposal not to regulate WFAEL, ISDN2 and ISDN30 markets on the basis that they no longer fulfil the three criteria test set out in the EC Recommendation?	<p>Yes, see Openreach's response for further detail.</p>

Question	Reference
Please set out your reasons and supporting evidence for your response.	
10.1: Do you agree with our proposal not to regulate WBA market on the basis that it no longer fulfils the three criteria test set out in the EC Recommendation? Please set out your reasons and supporting evidence for your response.	<p>Yes, we agree. Maintaining regulation will not stimulate additional entry in Market A, as further LLU rollout is unlikely. Since regulation in Market A has the sole purpose of protecting existing competition in these areas, BT's national pricing policy at the retail level is sufficient to protect consumers from excessive pricing. BT has no commercial incentives to change this policy when Market A is so small. We believe in any case that the Broadband USO is a more appropriate regulatory tool to deliver greater availability of broadband in Market A than further SMP regulation.</p> <p>We set this out further in our September 2017 response to Ofcom's consultation document 'Review of Wholesale Broadband Access Markets'.</p>

Table A9.2 – References to our responses to the consultation questions in WFTMR 2020, Volume 3

Question	Reference
1.1: Do you agree with our proposed approach to remedies? Please set out your reasons and supporting evidence for your response.	Please see our response to the specific remedy below.
2.1: Do you agree with our proposed approach to Copper retirement? Please set out your reasons and supporting evidence for your response.	<p>We welcome proposals to support the retirement of our copper network and consider this an important enabler for investing in full fibre as it reduces (although doesn't eliminate) the costs of operating two networks in parallel. Openreach's response for provides further detail on this and we fully support Openreach's position.</p> <p>However, regulation of CP to CP migration charges still goes against Ofcom's overall supportive position vis-a-vis switchover.</p> <p>Currently, whilst charges for initial FTTP connections are uncapped (Openreach charge £97 as standard), Openreach can only charge £2.99 for CP to CP migrations on FTTP. This leads to a market dynamic where retail CPs are incentivised to "go second", waiting for another CP to move the customer to FTTP (incurring the full connection charge) and then investing to win the customer when only having to pay the modest migration charge. The impact of this reticence to go first could delay fibre take-up. Whilst we recognise the importance of a dynamic switching market, we suggest Ofcom should allow more flexibility for Openreach to rebalance these charges.</p>
3.1: Do you agree with our proposed general remedies? Please set out your reasons and	As we set out more fully in chapter 4 of our Main Response, we have serious concerns about Ofcom's proposed prohibition on geographic discounts and the proposed notification process for 'other commercial terms'. We think that customers would gain more through investment and keener prices (and smaller players would still be protected) if FTTP and leased lines were

Question	Reference
<p>supporting evidence for your response.</p>	<p>excluded entirely from Ofcom's proposed restrictions on geographic discounts; and for existing restrictions (on FTTC and G.Fast) to be limited to preventing the targeting of discounts at new entrants, and be limited to Area 2.</p> <p>There is more reason to expect benefits than harms to arise from allowing Openreach the flexibility to compete, as it does not have significant market power in ultrafast markets and leased line competition is fierce in the CLA, the HNRs and beyond, in particular in the market segments where tenders are the norm. There is no evidence of unfair pricing practices today, or the risk of them. Openreach's pricing is already and will continue to be shaped by powerful customers who have no interest in harming infrastructure competition. Prescriptive regulation is therefore neither objectively necessary nor proportionate.</p> <p>If Ofcom nevertheless decides to proceed, it should indicate that wholesale pricing structures which do not target nascent networks are outside the scope of the geographic pricing remedy, and do not require a consent request. At a minimum, Ofcom should provide guidance on the types of schemes and offers it would expect to consent to, as it did when geographic pricing restrictions were first imposed as part of the WLA 2018. Equally, for commercial terms which are contingent on the volume and/or range of services purchased, but which have no impact on nascent networks, there is no case for a change to notification periods.</p> <p>Ofcom should also clarify its analytical framework for deciding whether to grant consent or to intervene following a review. The criteria Ofcom applies must be proportionate to its goal of promoting network competition. Otherwise there is a risk that regulation itself unduly stifles competitive responses by Openreach – and possibly investment – through the application of excessively cautious, and unpassable, thresholds.</p> <p>Ofcom should confirm that the principles established in competition law will form the basis of its assessment as these have been designed to assess (or reliably predict) competition effects. It is not appropriate to limit Openreach's conduct unless Ofcom can show that Openreach's pricing has (or will be likely to) materially harm end customers. Furthermore, we expect Ofcom to reflect the market conditions prevailing at the time. This would ensure that Ofcom's assessment appropriately reflects the likely competition and consumer impact.</p> <p>Finally, Ofcom should indicate how long any restrictions it ultimately decides to impose will last so that rivals can appropriately reflect fair competition with Openreach in their business cases. This would help avoid protracted regulatory disputes in which rivals rely on general statements from Ofcom which are mis-interpreted as a guarantee of their business case or particular market share outcomes.</p> <p>In addition to the above, we support the views Openreach has set out in relation to Ofcom's proposed general remedies in its separate response to Ofcom's WFTMR.</p>

Question	Reference
4.1: Do you agree with our proposed specific PIA remedies? Please set out your reasons and supporting evidence for your response.	See annexes 4 and 8.
5.1: Do you agree with our proposed specific remedies in the WLA, LL Access and IEC markets? Please set out your reasons and supporting evidence for your response.	We refer Ofcom to the separate response provided by Openreach which we fully support. As for the remedies Ofcom proposes in relation to the BT Core, which Ofcom proposes to define as part of the IEC market, we agree with Ofcom's proposed remedies subject to the changes we request in Annex 7 above.
6.1: Do you agree with our proposed dark fibre access and dark fibre inter-exchange remedies? Please set out your reasons and supporting evidence for your response.	See the separate WFTMR response by Openreach which we fully support. Regarding dark fibre access in Area 3 see also our response to question 2.4 in WFTMR 2020 Volume 4 below.
7.1: Do you agree with our proposed approach to QoS? Please set out your reasons and supporting evidence for your response.	See Openreach's response, which we fully support.

Table A9.3 – References to our responses to the consultation questions in WFTMR 2020, Volume 4

Question	Reference
1.1: Do you agree with our proposals for charge controlling WLA and LL access services in Area 2? Please set out your reasons and supporting evidence for your response.	Ofcom should confirm that its pro-investment regulatory policy will endure as the market transitions from copper to fibre and that the fair bet will be honoured by committing not to impose additional price regulation for at least 15 years, and by indicating (in advance and for each investment tranche) the level of risk-adjusted returns that BT will have the opportunity to earn. We set this out in greater detail in chapter 3 of our Main Response.
2.1: Do you agree that a RAB based control will achieve our objective in Area 3? Please set out your reasons and supporting evidence for your response.	Ofcom should apply the same regulatory approach in non-competitive areas as elsewhere in the country to support investment by BT. We intend to build in the more costly parts of the country and stand ready to make a commitment with the right regulatory pricing and long-term signals to help us get going quickly. Ofcom's alternative approach for encouraging investment by BT (the 'post build' option) is unlikely to be effective as proposed. This is because the proposed uplifts to copper prices are insufficient to support the necessary investment given the costs and risks involved. It could also result in

Question	Reference
	significant price differentials between different parts of the country for fibre and copper. We set this out in greater detail in chapter 5 of our Main Response.
<p>2.2: Do you agree that is appropriate to impose a post-build RAB charge control in Area 3? Please set out your reasons and supporting evidence for your response.</p>	<p>We prefer a forecast approach for investment in Area 3. One of the advantages is that it will make clear the extent of premises which can be addressed by Openreach in the time frame up to 2025 under CPI indexation, giving price continuity and consistent pricing across the UK. We set this out in greater detail in chapter 5 of our Main Response.</p>
<p>2.3: Do you have any comments on our proposed design and method for calculating the proposed post-build RAB charge controls? Please set out your reasons and supporting evidence for your response.</p>	<p>A post-build RAB charge control requires a set of 'K' uplifts which provide BT with a genuine incentive to invest - we consider the K uplifts proposed as too low.</p> <p>We are also concerned about the scale of reduction in FTTC prices which Ofcom has proposed. Openreach has set out why the range of -5.75% to -15% each year is much too steep, and we share this view. We set out our response to this question in section 5 of our Main Response.</p>
<p>2.4: Do you agree with our proposals to charge control LL access services and dark fibre in Area 3? Please set out your reasons and supporting evidence for your response.</p>	<p>We do not agree that dark fibre is appropriate for Area 3. Notwithstanding this, if Ofcom does press ahead with this new obligation then it must ensure that Openreach can recover all its costs in supplying business services in Area 3.</p> <p>BT is concerned that Ofcom's guidance on network adjustments could be interpreted, in effect, to require Openreach to supply new dark fibre in response to any request. As set out by Openreach, such guidance would not be consistent with Ofcom's legal powers to impose Network Access obligations and could result in Openreach being required to deliver requests that are disproportionate, or that in reality require Openreach to extend its network rather than adjust the existing network.</p> <p>Openreach has therefore proposed a set of definitions that allow a distinction to be made between requests for supply of dark fibre which are subject to regulatory obligations from those which are not and can therefore be rejected. These definitions will provide clarity for Openreach and more certainty for its customers.</p> <p>We set out our full response to this question in chapter 5 of our Main Response and also refer Ofcom to Openreach's response to the WFTMR 2020 which we fully support.</p>
<p>3.1: Do you agree with our proposals in relation to charge control design and implementation? Please set out your reasons and supporting evidence for your response.</p>	<p>See Openreach's response which we fully support.</p>
<p>4.1: Do you agree with our proposals for charge controlling in the IEC markets? Please set out</p>	<p>See Openreach's response which we fully support.</p>

Question	Reference
your reasons and supporting evidence for your response.	
5.1: Do you agree with our proposals relating to calculating PIA rental charges? Please set out your reasons and supporting evidence for your response.	No, Ofcom must update its forecast cost, and the allocation of cost to be recovered via regulated charges must be adjusted to better reflect the opportunity to earn revenue from the infrastructure in a full fibre world. A full response is provided in chapter 6 of our Main Response and in Openreach's response to the WFTMR 2020 which we fully support. We also refer to Annex 4 where we set out additional views on Ofcom's approach to DPA pricing and the undue risks the pricing regime based on a per component charge exposes BT.
5.2: Do you agree with the above proposal to introduce the PIA simplified underground lead-in service and the associated timings? Please set out your reasons and supporting evidence for your response.	See Openreach's response which we fully support.
6.1: Do you agree with our proposed approach to charge controls for ancillaries? Please provide evidence to support your views. Please set out your reasons and supporting evidence for your response.	See Openreach's response which we fully support.
6.2: Do you agree with our proposals for fair and reasonable obligations for ancillaries not covered by a charge control? Please set out your reasons and supporting evidence for your response.	See Openreach's response which we fully support.

