Neutral citation [2017] CAT 25

IN THE COMPETITION APPEAL TRIBUNAL

Case No: 1260/3/3/16

Victoria House
Bloomsbury Place
London WC1A 2EB

10 November 2017

Before:

MR JUSTICE SNOWDEN
(Chairman)
DR CLIVE ELPHICK
PROFESSOR JOHN CUBBIN

Sitting as a Tribunal in England and Wales

BETWEEN:

BRITISH TELECOMMUNICATIONS PLC

Appellant

- v -

OFFICE OF COMMUNICATIONS

Respondent

- and -

VIRGIN MEDIA LIMITED

CP GROUP (TALKTALK TELECOM GROUP PLC, VODAFONE LIMITED, COLT TECHNOLOGY SERVICES AND HUTCHISON 3G UK LIMITED)

GAMMA TELECOM HOLDINGS LIMITED

CITYFIBRE INFRASTRUCTURE HOLDINGS PLC

Interveners

Heard at Victoria House on 10-13 and 24-27 April, 4-5, 8-10, 17-18 and 24 May 2017

JUDGMENT (MARKET DEFINITION)

APPEARANCES

Mr Daniel Beard QC, Mr Robert Palmer, Ms Ligia Osepciu and Mr David Gregory (instructed by BT Legal) appeared on behalf of British Telecommunications plc.

Mr Josh Holmes QC, Mr Mark Vinall, Mr Tristan Jones and Mr Daniel Cashman appeared on behalf of the Office of Communications.

Ms Sarah Love and Mr Tim Johnston (instructed by Charles Russell Speechlys) appeared on behalf of Gamma Telecom Holdings Limited.

Mr Philip Woolfe (instructed by Towerhouse LLP) appeared on behalf of TalkTalk Telecom Group plc, Vodafone Limited, Colt Technology Services, Hutchison 3G UK Limited.

Ms Sarah Ford QC (instructed by Ashurst LLP) appeared on behalf of Virgin Media Limited.

Note: Excisions in this Judgment (marked "[…][✂]") relate to commercially confidential information: Schedule 4, paragraph 1 to the Enterprise Act 2002.

CONTENTS

FIGURES

TABLES

ANNEXES

A. OVERVIEW

(1) Introduction

1. This case concerns the regulation of leased lines. These are high quality fixed connections allowing the transmission of large volumes of data between sites. They are supplied wholesale by communications providers ("**CPs**") with the necessary fixed network infrastructure. They are used to supply data connections to businesses,[1] as well as fixed and mobile broadband services to consumers.

2. The Appellant, British Telecommunications plc ("**BT**") operates the largest network in the UK, with existing connections to the vast majority of business premises. Openreach is a division of BT involved in the wholesale supply of leased lines. Arrangements exist to ensure that Openreach supplies BT's retail division and other CPs' retail divisions on a non-discriminatory basis. In the remainder of this judgment we do not distinguish between Openreach and BT unless the context requires it. Importantly, BT is the largest supplier of leased lines by some distance. The second largest network is operated by Virgin Media ("**VM**"), which intervenes in support of BT.

3. BT's appeal relates to the Business Connectivity Market Review 2016 ("**BCMR 2016**") conducted by the Office of Communications ("**Ofcom**"). Ofcom's conclusions from its review are set out in a Statement published on 28 April 2016 (the "**Final Statement**" or "**FS**"). A group of four CPs has intervened in support of Ofcom: TalkTalk Telecoms Group plc ("**TalkTalk**"), Vodafone Limited ("**Vodafone**"), Colt Technology Services ("**Colt**"), and Hutchison 3G UK Limited. This group is jointly represented in the proceedings and refer to themselves collectively as the "**CP Group**". Gamma Telecom Holdings Limited ("**Gamma**") has also intervened in support of

[1] Unless the context otherwise requires, the term "business" is used as shorthand for "organisation" and it includes not only private sector businesses, but public sector bodies, charities and other large organisations.

Ofcom in relation to most aspects of the appeal, but in support of BT in relation to the aspect of its appeal concerning geographic market definition.

(2) The market review process and the BCMR 2016

4. Because of the extensive infrastructure needed to provide leased lines, there are high and non-transitory barriers to market entry. The EU regulatory framework applicable to communications therefore identifies the leased lines market as one of the four types of market in which effective competition may be lacking. Ofcom and other national regulatory authorities ("**NRAs**") must therefore review it every three years, to see whether regulation is needed.

5. The review is a forward-looking exercise, which seeks to determine the competitive position over the three year period until the next review. It consists of three stages.[2] NRAs must: (1) define relevant markets appropriate to national circumstances; (2) assess whether there is a lack of effective competition by reason of one or more CPs with significant market power ("**SMP**"); and (3) if so, impose regulatory obligations on the CP(s) with SMP to protect end-users and the process of competition. In defining the relevant market, NRAs must take utmost account of guidance from the European Commission ("**Commission**"), including its Recommendation on relevant markets (the **"Recommendation**")[3] and the accompanying explanatory note (the **"Explanatory Note**").[4]

6. The regulatory scheme envisages that as markets develop, mature and become more competitive, regulation will only be maintained or imposed where it is demonstrated to be necessary. The regulatory scheme has moved away from a scheme whereby regulation was imposed to "open up" markets held by former monopoly incumbents, to one where regulation will only be imposed if it can

[2] See Article 16 FD and Section 79 of the CA 2003 in Section C below.
[3] The Commission Recommendation of 9 October 2014 on relevant product and service markets within the electronic communications sector susceptible to *ex ante* regulation in accordance with Directive 2002/21/EC of the European Parliament and of the Council on a common regulatory framework for electronic communications networks and services (2014/710/EC).
[4] Explanatory Note accompanying the Commission Recommendation on relevant product and service markets within the electronic communications sector susceptible to ex ante regulation in accordance with Directive 2002/21/EC of the European Parliament and of the Council on a common regulatory framework for electronic communications networks and services, 9 October 2014, SWD(2014) 298.

be shown that a market participant holds SMP. The general expectation is that over time the direction of travel will therefore be towards deregulation as existing regulation becomes unnecessary in the light of increasing competition.

7. In the UK, Ofcom's periodic reviews of the leased lines sector are known as "Business Connectivity Market Reviews" or "BCMRs". The BCMR 2016 is the most recent such review. The previous review was completed on 28 March 2013 (the "**BCMR 2013**").

8. In the BCMR 2013 Ofcom defined two separate product markets for "contemporary interface symmetric broadband origination" ("**CISBO**") services. These were a market for business connectivity for lower bandwidth (*i.e.* up to and including one gigabit per second, or ≤1G) CISBO services, and, separately, a market for business connectivity for very high bandwidth ("**VHB**") CISBO services (*i.e.* over one gigabit per second, or >1G services). Ofcom also found that each product market consisted of two geographic markets, one area known as the Western, Eastern and Central London Area ("**WECLA**") and the second known as the Rest of the UK (**"RoUK"**)[5]. Ofcom concluded that, of those four markets, BT had SMP in all of them except the WECLA VHB market.

9. In its BCMR 2016, Ofcom defined a single product market for CISBO services of all bandwidths; and three separate relevant geographic markets – the Central London Area ("**CLA**"); the London Periphery ("**LP**"); and the RoUK. The CLA and LP combined are identical in scope to the WECLA. Ofcom determined that BT had SMP in the LP and RoUK only. Ofcom found that BT's prices in those markets were well above costs and its quality of service was unacceptably poor.

10. By way of remedies, Ofcom required BT to make immediate price reductions, to observe price caps applicable over the three years until the next review, and to meet minimum service standards. Ofcom also introduced a "passive"

[5] The RoUK excludes the Hull area.

remedy, allowing CPs to lease only the fibre element of leased lines from BT and to attach equipment of their own choosing at either end, instead of having to purchase an "active" service (a package including fibre and electronics to "light" the fibre) from BT. This passive remedy is referred to as Dark Fibre Access ("**DFA**").

11. In terms of impact of the numbers of circuits subject to regulation, the changes brought about by the BCMR 2016 would result in:

    (1) around 30,597 lower bandwidth circuits situated in the CLA being removed from SMP regulation; and

    (2) around 762 VHB circuits situated in the LP falling within the scope of SMP regulation for the first time.

12. The BCMR 2016 would therefore lead to an overall reduction in total numbers of circuits subject to SMP regulation, which is consistent with the general trend of telecoms markets towards deregulation. Nevertheless, with regards to VHB services, there has been a shift against this general trend towards increased regulation which affects a small but significant number of VHB circuits in the LP.

(3) The scope of this judgment and our conclusions

13. BT lodged its appeal on 29 June 2016. It comprises six grounds of appeal. In broad terms:

    (1) BT contended that Ofcom wrongly defined the relevant product and geographic market (**Grounds D1 and D2**).

    (2) BT contended that Ofcom wrongly defined the extent of the "core conveyance network" (**Ground D3**).

(3) BT contended that Ofcom erred in imposing a DFA remedy. It contended that no remedy should have been imposed (**Grounds E1 to E3**).

14. Separately, two other companies lodged appeals concerning the FS.

(1) TalkTalk, one of the CPs intervening in support of Ofcom in BT's appeal, lodged an appeal on 28 June 2016 arguing that the design of the DFA remedy was flawed. In very broad terms it argued that the price set by Ofcom would be too high. As noted above, TalkTalk is a member of the CP Group which has intervened in BT's appeal in support of Ofcom.

(2) CityFibre Infrastructure Holdings plc ("**CF**") lodged its appeal on 29 June 2016. CF operates pure fibre networks in around 35 UK cities. CF's appeal partly overlapped with BT's appeal, especially regarding the portions of BT's appeal dealing with market definition (Grounds D1 and D2 of BT's appeal). CF also contended that the DFA remedy was inappropriate. At Grounds 3 and 4b of its notice of appeal, CF raised specific arguments that the design of the DFA remedy was flawed. CF also intervened in support of BT in relation to certain aspects of its appeal.

15. For context we note that, in broad terms, BT's arguments in respect of the DFA remedy were that:

(1) the DFA remedy is flawed and disproportionate because it targets only the most competitive segment of the market (i.e. VHB);

(2) Ofcom failed to take proper account of Directive 2014/61/EU ("the Civil Infrastructure Directive") and, in particular, no consideration was given to the extent to which the claimed benefits of the DFA remedy would be achieved in any event following the implementation of the Civil Infrastructure Directive with effect from July 2016;

(3) Ofcom erred in conducting its cost-benefit analysis of the DFA remedy. In particular, Ofcom: (i) overstated the benefits of dark fibre; (ii) understated the risks of dark fibre; (iii) adopted an inconsistent approach to the timeframes for assessment of benefits and risks; (iv) failed to take into account the difficulty and costs of reversing the DFA remedy once implemented; and (v) failed to undertake a proper balancing exercise of the benefits and risks of the DFA remedy.

In addition, CF argued that if (which it denied) a remedy should be imposed, the more appropriate and proportionate remedy would be to enforce access to BT's 'duct and poles' rather than DFA.

16. To understand the scope of this judgment, it is necessary briefly to set out the relevant legislation and the procedural history of these proceedings. Under section 193(1) of the Communications Act 2003 (**"2003 Act"**), if an appeal contains a specified price control matter ("**specified PCM**") the Tribunal is required to refer that matter to the Competition and Markets Authority ("**CMA**") for determination. In broad terms, a specified PCM is a matter which relates to the design of a price control, as opposed to the question as to whether or not to impose a price control at all.

17. On 23 September 2016 the Tribunal convened a first case management conference ("**CMC**") to consider the management of BT, CF and TalkTalk's appeals. At that CMC the Tribunal decided that it was required to refer Grounds 3 and 4b of CF's appeal and the entirety of TalkTalk's appeal to the CMA for determination. All the remaining matters (*i.e.* BT and CF's grounds of appeal concerning market definition and remedy, excluding those portions of CF's appeal which were specified PCMs) were set down for a hearing commencing in April 2017. The Tribunal subsequently referred the specified PCMs contained in CF's and TalkTalk's appeals to the CMA by orders dated 17 November 2016, and set down a deadline for the determination of the reference by 31 March 2017. This deadline was later extended until 7 April 2017, the working day before the start of the hearing of the remaining matters.

18. On 28 February 2017 the CMA issued its provisional determination of the specified PCMs in TalkTalk and CF's appeals. The CMA indicated it had provisionally determined that Grounds 3 and 4b of CF's appeal were ill-founded, but that TalkTalk's appeal was well-founded. In summary, the CMA provisionally determined that Ofcom was wrong to decide that (in the absence of a change to the rating rules by further legislation) the rating costs to be deducted from the price of the reference active products in deriving the price for DFA should be based on an attribution of BT's rates costs to the fibre, rather than some other appropriate measure. It further concluded that another appropriate measure would be one of access-seekers' rates, which would be a materially higher sum. Further, the CMA indicated that it was minded to propose to the Tribunal that the matter be remitted to Ofcom, so that Ofcom could consult on how the DFA price might best be derived in a manner which took into account the CMA's determination.

19. The Tribunal considered the implications of the CMA's provisional determination at a pre-trial review on 29 March 2017. Ofcom argued that the provisional determination, were it to become final, would have relatively limited impact on the April hearing. Ofcom indicated that it would not seek a review of the CMA's determination, but would instead conduct a swift consultation and reach a fresh decision in early summer 2017, recalibrating the DFA remedy in the light of the CMA's findings. In the meantime, Ofcom contended, the April hearing should proceed with the Tribunal hearing arguments on all aspects of the case save for those elements concerning remedy which were affected by the CMA's determination. BT and CF, on the other hand, argued that the CMA's determination would have a profound impact on the remedy element of the proceedings. BT applied (with CF's support) to have the substantive hearing adjourned until after Ofcom had reached its further decision on remedy.

20. The Tribunal indicated to the parties that the most appropriate course, should the CMA affirm its provisional determination, would be to order a split hearing between the market definition and remedy issues. Arguments concerning market definition would be heard in the existing April window, whilst any remedy issues would be re-fixed for a later date. This would avoid

the risk of time-consuming satellite disputes concerning precisely which aspects of the remedy case should be heard in April and at the same time would make use of the existing window held in the parties' and Tribunal's diaries and allow a substantial and important aspect of the appeals to progress toward determination.

21. On 6 April 2017 the CMA reached its final determination of the specified PCMs, essentially affirming its provisional determination. Shortly afterward, CF wrote to the Tribunal indicating that it had reached agreement with Ofcom to amend its Notice of Appeal so as to remove its challenge in respect of market definition and the corresponding portions of its statement of intervention, but maintaining its position regarding remedy. CF therefore took no further part in the April hearing and the hearing dealt with only those aspects of BT's appeal which concerned market definition and the extent of BT's core conveyance network.

22. Ofcom issued its decision on the remitted matters on 30 June 2017. That remittal decision had no bearing on the matters at issue in this judgment.

23. On 26 July 2017 we issued a ruling setting out our decision in relation to the market definition issues in BT's appeal and stated that our reasons would follow: [2017] CAT 17. We took this unusual step because it became clear to us that a remedies hearing in September would be unnecessary and we considered it desirable to inform the parties of this so as to avoid them incurring unnecessary costs. In our ruling, we unanimously concluded that:

(1) Ofcom erred in concluding that it was appropriate to define a single product market for CISBO services of all bandwidths;

(2) Ofcom erred in concluding that the RoUK comprises a single geographic market; and

(3) Ofcom erred in its determination of the boundary between the competitive core segments and the terminating segments of BT's network.

24. This judgment sets out our reasons for those findings. The judgment is structured as follows:

(1) Section B sets out the uncontroversial technical background relevant to this appeal.

(2) Section C sets out the relevant legal framework.

(3) Section D describes the witnesses and evidence in the appeal.

(4) Section E sets out the parties' contentions in outline.

(5) Section F concerns BT's ground of appeal relating to relevant product market.

(6) Section G concerns BT's ground of appeal relating to relevant geographic market.

(7) Section H concerns BT's ground of appeal relating to its core conveyance network.

(8) Section I summarises our conclusions.

25. We were greatly assisted by the parties preparing an agreed list of issues, which encapsulated the issues raised by BT's Notice of Appeal and Ofcom's Defence. The parties also sought to adhere to these agreed issues in the course of their written and oral arguments. For convenience, therefore, we have also used those issues to structure this judgment. As explained in section E below, issues 1-3 concerned product market definition, whilst issues 4 and 5 fell away before the hearing. Issues 6 and 7 concerned geographic market definition and issue 8 concerned the competitive core. A copy of the list of issues is annexed to this judgment at **Annex 1**. The judgment uses a number of abbreviations: for convenience a list of abbreviations is annexed to this judgment at **Annex 2**.

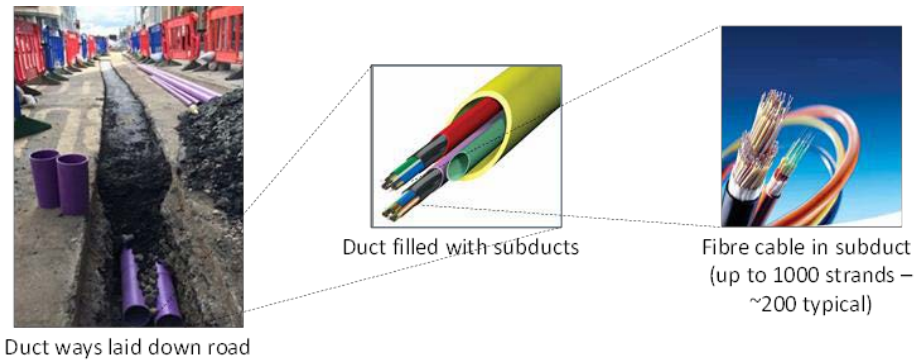
B. TECHNICAL BACKGROUND

(1) Leased lines

26. Ofcom defined "leased lines" as "high-quality, dedicated, point-to-point data transmission services used by businesses and providers of communications services."[6] Leased lines are used to transmit data over physical infrastructure and are available in various different capacities or "bandwidths" (these are also colloquially referred to as "speeds"), specified in terms of the number of individual bits of data they are able to carry per second. A leased line of 100Mb/s can carry 100 million bits per second; a leased line of 1Gb/s can carry 1 billion bits per second. In this judgment we use "1G", "10G" and "100G" as shorthand for 1Gb/s etc. Similarly, we use "10M" and "100M" as shorthand for 10Mb/s and 100Mb/s.

27. Leased lines are built using fibre optic cables laid in ducts under the ground. Cables typically comprise around 200 individual strands, but can number as many as one thousand. Ducts can be different sizes and often there are smaller ducts, called sub-ducts, laid within the primary duct. The costs of digging and reinstatement (e.g. repairing road or pavement surfaces) are substantial and can also vary significantly from location to location. It is often also necessary to obtain wayleaves which can also add substantially to the cost and time required to dig trenches.

Figure 1: Fibre optic cables



[6] FS, page i.

28. Simplifying somewhat, fibre optic cables are made of strands of glass about the width of a human hair. Fibre optic cables have a massive potential capacity for carrying data: in an experiment in 2015 a record transmission rate of 2.15 Petabits per second was achieved over a 31km distance.[7]

(2) Ethernet and WDM technology

29. Ethernet is the technology most commonly used in modern leased lines. Ethernet is an internationally standardised technology consisting of a set of physical interfaces and framing formats. It is very widely deployed in offices and homes in devices such as laptops, broadband modems, routers and switches which can all connect together in a consistent manner. Protocols such as the internet protocol ("**IP**") use Ethernet as their means of transmitting data. CPs can offer Ethernet connectivity as a service between different locations. Over time Ethernet speeds have steadily increased from 10M to up to 100G, allowing it successfully to support traffic such as voice, data, and storage.

30. Rather than use Ethernet, some very high bandwidth services use wavelength-division multiplex ("**WDM**") equipment. This allows the extraction of greater capacity from a fibre optic cable by using different wavelengths to carry separate traffic. Filters are needed at both ends of the cable to join and split the signals. "Dense WDM" can carry up to 80 frequencies; "Coarse WDM" carries significantly fewer.

(3) Ethernet in the First Mile

31. Ethernet in the First Mile (**"EFM"**) permits users to use Ethernet connectivity over legacy infrastructure, in particular the copper wire pairs or multiple bonded pairs in the access segment that connect the end-user's site to the nearest node. The copper pair is dedicated to the EFM service and is therefore able to provide dedicated symmetric connectivity to the customer. In that sense the EFM service is identical to an Ethernet optical line. However, as

[7] One petabit per second is equivalent to a million gigabits per second.

copper wire lacks the physical characteristics of fibre optic strands, EFM offers somewhat lower bandwidth than would an optical leased line.

32. As will be explained further below, Ofcom included EFM in its definition of a single product market for CISBO services on the basis that it exerted competitive pressures on lower bandwidth CISBO services, but excluded EFM in its network reach and boundary tests for the purpose of defining the relevant geographic markets on the basis that EFM could in principle be used to supply customers throughout an area and did not assist in identifying geographic variations in competitive conditions.

(4) BT's leased line products

33. The primary leased line product currently offered by Openreach is mandated by regulation and is called Ethernet Access Direct (**"EAD"**). It carries a single connection of specified symmetric bandwidth between two locations using a dedicated strand of optical fibre. There are three different types according to bandwidth. The EAD bandwidths which Openreach offers are:

(1) 100M (which can be configured to 10M if required);

(2) 1G; and

(3) 10G.

34. These bandwidths directly reflect the international standards for Ethernet interfaces and are the maximum bandwidth that can be carried by the relevant EAD service. However, downstream customers of Openreach can "throttle" the bandwidth of an overall end-to-end service and therefore limit the maximum bandwidth available to an end user.

35. BT's main WDM-based products are called Optical Spectrum Access, and Optical Spectrum Extended Access. The service can allow multiple wavelengths and each wavelength can be configured to carry 1G, 10G, 40G, or even 100G.

(5) Users of leased lines

36. Leased lines are a critical component in most communications services offered by CPs. Their applications can be classified into three broad categories:

(1) fixed access for business sites (**"Business Access"**);

(2) use by Mobile Network Operators (**"MNOs"**) to connect their mobile base stations to the network (**"Mobile Backhaul"**); and

(3) use to connect CPs' networks to Openreach's residential access services at BT's local exchanges, in particular local loop unbundling (**"LLU"**) and next generation access (**"NGA"**) (collectively **"LLU backhaul"**).

(a) Business Access

37. A number of CPs supply a broad range of bespoke services to business users. Leased lines may be bundled with other telecoms services and sometimes management functions as well. Leased lines, often as components of Virtual Private Networks (**"VPNs"**), can carry a wide range of services, for example, access to the internet, connectivity between business sites and connectivity with data centres for cloud computing services. Business users have a diverse range of needs, reflecting the wide variety of industry sectors and of business sizes. A business with a single site might use a leased line for stable high bandwidth access to the internet from that site. For multi-site businesses, leased lines or VPNs might be bundled into large ICT services contracts.

38. The main element in the retail services relevant to the BCMR is the provision of connectivity between the sites of the business which is securely isolated from services provided by the CP to other customers. Such connectivity can be provided 'point-to-point' or via the creation of a VPN using the network of a downstream CP.

(b) Mobile Backhaul

39. MNOs supply mobile services to both residential and business consumers and to wholesale customers such as Mobile Virtual Network Operators. The main characteristic of this sector is that the end points of services are individual people on the move. MNOs use the same network to supply residential and business customers. MNOs require leased lines for connectivity between their base stations (housing their radio masts) and the sites which house their switching equipment. The use of a leased line in this context is referred to as "mobile backhaul" or "MNO backhaul".

(c) LLU Backhaul

40. LLU provides access to LLU operators to the pair of copper wires which directly connect a residential consumer's home to the BT local exchange. LLU operators (e.g. VM, TalkTalk and Sky) can place equipment in BT's local exchanges and using LLU can thereby supply the mass market with packages of services comprising one or more of: public telephone service, broadband internet access and TV/video services. NGA involves either laying fibre to the customer's premises ("Fibre to the Premises" or "FTTP"), bypassing the copper network completely or, much more commonly, running optical fibre from the local exchange to a street cabinet ("Fibre to the Cabinet" or "FTTC") and installing equipment in the street cabinet to drive the higher bandwidth achievable using the shorter length of copper wire.

41. LLU and NGA are together referred to as "LLU Backhaul". LLU operators purchase LLU Backhaul to provide their services. For example, Sky and TalkTalk, as major LLU operators, require access to roughly 3,000 of BT's 5,500 local exchanges which account for over 90% of all homes in the UK. BT's downstream unit also offers services to the mass market and, under regulations, must purchase LLU Backhaul from Openreach in an identical way to the LLU operators. The only significant difference is that BT downstream offers service from all of BT's 5,500 local exchanges.

(6) Resilience

42. Since leased lines are critical components used to deliver many important services, reliability is a key requirement for many users. This means not only that leased lines are engineered to high standards to minimise the incidence of faults, but also that users take steps to minimise the impact of any fault. In many cases, the "downtime" when communication systems are inoperable due to a fault in a leased line, or an accident causing the severance of a line, will be unacceptable even if the supplier has in place effective fault management and repair processes. Similarly, downtime resulting from the failure of a commercial relationship with the supplier of the leased line can be equally unacceptable.

43. In such cases, the end-user requires resilience, which means that two separate leased lines are used in parallel, so that if one fails the other remains available. Resilience can be in the form of physical resilience (constructing the two leased lines in two separate physical paths), and/or commercial resilience (purchasing leased lines from two different CPs). The strongest form of resilience would be to have two separate paths and two separate providers, the next strongest would be two separate paths but the same provider, then the same path but two separate providers. Finally it is also possible to have a single path and a single provider but to purchase two strands on that path to provide some degree of resilience in the event of electronics systems failure.

C. THE LEGAL FRAMEWORK

44. This section sets out the relevant legal framework at both EU and national level. It also refers to some of the relevant guidance documents, along with an explanation of the principles governing the standard of review to be carried out by this Tribunal on this appeal.

(1) The EU Common Regulatory Framework

45. The provision of electronic communications networks and services in the United Kingdom is regulated under the Common Regulatory Framework (**"the CRF"**) provided for by the Framework Directive (2002/21/EC) (**"the FD"**) and four "specific Directives". One such specific Directive of relevance to this appeal is the Access Directive and Interconnection Directive (2002/19/EC) (**"the AD"**).

(a) The FD

46. Article 8 FD sets out the policy objectives and regulatory principles to be observed by NRAs in carrying out the regulatory tasks specified in the FD and in the AD. Among other things, NRAs must take reasonable and proportionate measures aimed at achieving objectives which include the promotion of competition, the development of the internal market, and the promotion of the interests of the citizens of the EU.

47. Article 8(5) FD provides:

> "5. The national regulatory authorities shall, in pursuit of the policy objectives referred to in paragraphs 2, 3 and 4, apply objective, transparent, non-discriminatory and proportionate regulatory principles by, inter alia:
>
> > (a) promoting regulatory predictability by ensuring a consistent regulatory approach over appropriate review periods;

> (b) ensuring that, in similar circumstances, there is no discrimination in the treatment of undertakings providing electronic communications networks and services;
>
> (c) safeguarding competition to the benefit of consumers and promoting, where appropriate, infrastructure-based competition;
>
> (d) promoting efficient investment and innovation in new and enhanced infrastructures, including by ensuring that any access obligation takes appropriate account of the risk incurred by the investing undertakings and by permitting various cooperative arrangements between investors and parties seeking access to diversify the risk of investment, whilst ensuring that competition in the market and the principle of non-discrimination are preserved;
>
> (e) taking due account of the variety of conditions relating to competition and consumers that exist in the various geographic areas within a Member State;
>
> (f) imposing *ex-ante* regulatory obligations only where there is no effective and sustainable competition and relaxing or lifting such obligations as soon as that condition is fulfilled."

48. Articles 14-16 FD concern the identification of markets and SMP.

49. Article 14(2) FD provides that where the specific Directives require NRAs to determine whether operators have SMP in accordance with the market analysis procedure referred to in Article 16 FD, an undertaking shall be deemed to have SMP if:

> "either individually or jointly with others, it enjoys a position equivalent to dominance, that is to say a position of economic strength affording it the power to behave to an appreciable extent independently of competitors, customers and ultimately consumers."

50. Article 15(1) FD requires the Commission to adopt a Recommendation on Relevant Product and Service Markets which identifies those product and service markets within the electronic communications sector, the characteristics of which may be such as to justify the imposition of regulatory obligations set out in the specific Directives. Article 15(2) requires the Commission to publish guidelines for market analysis and the assessment of SMP. Article 15(3) requires NRAs, taking utmost account of the Recommendation and Guidelines, to define relevant markets appropriate to

national circumstances, in particular relevant geographic markets within their territory, in accordance with the principles of competition law.

51. Article 16 FD concerns the market analysis procedure and provides as relevant:

> "1. National regulatory authorities shall carry out an analysis of the relevant markets taking into account the markets identified in the Recommendation, and taking the utmost account of the Guidelines. Member States shall ensure that this analysis is carried out, where appropriate, in collaboration with the national competition authorities.
>
> 2. Where a national regulatory authority is required under paragraphs 3 or 4 of this Article, Article 17 of Directive 2002/22/EC (Universal Service Directive), or Article 8 of Directive 2002/19/EC (Access Directive) to determine whether to impose, maintain, amend or withdraw obligations on undertakings, it shall determine on the basis of its market analysis referred to in paragraph 1 of this Article whether a relevant market is effectively competitive.
>
> 3. Where a national regulatory authority concludes that the market is effectively competitive, it shall not impose or maintain any of the specific regulatory obligations referred to in paragraph 2 of this Article. In cases where sector specific regulatory obligations already exist, it shall withdraw such obligations placed on undertakings in that relevant market. An appropriate period of notice shall be given to parties affected by such a withdrawal of obligations.
>
> 4. Where a national regulatory authority determines that a relevant market is not effectively competitive, it shall identify undertakings which individually or jointly have a significant market power on that market in accordance with Article 14 and the national regulatory authority shall on such undertakings impose appropriate specific regulatory obligations referred to in paragraph 2 of this Article or maintain or amend such obligations where they already exist."

52. Article 16(6) FD requires NRAs to consult on any draft measures that they intend to propose under Article 16 in accordance with the procedure in Articles 6 and 7. Article 6 requires consultation with interested parties, and Article 7(3) requires NRAs to make their proposed regulatory measures (such as the Final Statement in this case), available in draft to other NRAs, the Body of European Regulators for Electronic Communications (**"BEREC"**) and the Commission, which then have one month in which to respond. Article 7(5) FD then requires the NRA to take "utmost account" of the comments of the other NRAs, BEREC and the Commission.

(b) The AD

53. The AD harmonises the way in which the Member States regulate access to, and interconnection of, electronic communications networks and associated facilities.

54. Article 1(1) explains:

> "The aim is to establish a regulatory framework, in accordance with internal market principles, for the relationships between suppliers of networks and services that will result in sustainable competition, interoperability of communications services and consumer benefits."

55. Article 5(1) provides that NRAs shall, acting in pursuit of the objectives set out in Article 8 FD, "encourage and where appropriate ensure, in accordance with the provisions of this Directive, adequate access and interconnection, and the interoperability of services, exercising their responsibility in a way that promotes efficiency, sustainable competition, efficient investment and innovation, and gives the maximum benefit to end-users."

56. Article 5(2) provides:

> "Obligations and conditions imposed in accordance with paragraph 1 shall be objective, transparent, proportionate and non-discriminatory [...]."

57. Article 8(2) AD provides that, where an operator is designated as having SMP on a specific market as a result of a market analysis carried out in accordance with Article 16 FD, NRAs shall impose the obligations set out in Articles 9 to 13 AD as appropriate. Article 8(3) provides that such obligations shall not be imposed on operators which have not been designated as having SMP. Under Article 8(4) AD, any obligations imposed on SMP operators shall be "based on the nature of the problem identified, proportionate and justified in the light of the objectives laid down in Article 8 [FD]".

58. The obligations that can be imposed by an NRA include obligations of access to and use of specific network facilities under Article 12, and the imposition of price control and cost accounting obligations under Article 13.

(2) The 2003 Act

59. Ofcom's general duties are set out in section 3 of the 2003 Act. Ofcom's principal duty, as set out at section 3(1), is:

> "(a) to further the interests of citizens in relation to communications matters; and
>
> (b) to further the interests of consumers in relevant markets, where appropriate by promoting competition."

60. Section 3(3) provides:

> "In performing their duties under subsection (1), Ofcom must have regard, in all cases, to—
>
> (a) the principles under which regulatory activities should be transparent, accountable, proportionate, consistent and targeted only at cases in which action is needed; and
>
> (b) any other principles appearing to Ofcom to represent the best regulatory practice."

61. Section 3(4) provides that Ofcom must also have regard to various matters as appear to them to be relevant in the circumstances, including inter alia:

> "(b) the desirability of promoting competition in relevant markets;
>
> […]
>
> (d) the desirability of encouraging investment and innovation in relevant markets;"

62. Section 4(2) requires Ofcom, in carrying out its functions as NRA, to act in accordance with the six "Community requirements", which give effect to the requirements in Article 8 FD.

63. Section 6 provides :

> "(1) Ofcom must keep the carrying out of their functions under review with a view to securing that regulation by Ofcom does not involve—
>
> (a) the imposition of burdens which are unnecessary; or
>
> (b) the maintenance of burdens which have become unnecessary."

64. Section 79 provides that, before making a market power determination, Ofcom must identify the relevant market and carry out an analysis of the relevant market. The relevant subsections are as follows:

> "(1) Before making a market power determination, Ofcom must—
>
> (a) identify (by reference, in particular, to area and locality) the markets which in their opinion are the ones which in the circumstances of the United Kingdom are the markets in relation to which it is appropriate to consider whether to make the determination; and
>
> (b) carry out an analysis of the identified markets.
>
> (2) In identifying or analysing any services market for the purposes of this Chapter, Ofcom must take due account of all applicable guidelines and recommendations which—
>
> (a) have been issued or made by the European Commission in pursuance of the provisions of an EU instrument; and
>
> (b) relate to market identification and analysis.
>
> (3) In considering whether to make or revise a market power determination in relation to a services market, Ofcom must take due account of all applicable guidelines and recommendations which—
>
> (a) have been issued or made by the European Commission in pursuance of the provisions of an EU instrument; and
>
> (b) relate to market analysis or the determination of what constitutes significant market power."

65. Section 78 provides that a person shall be taken to have SMP in relation to a market if he enjoys a position which amounts to or is equivalent to dominance of the market.

66. Where Ofcom determines that a person has SMP within a particular market then, under sections 45(1) and 45(2)(b)(iv) of the 2003 Act, Ofcom has the power to set an "SMP condition".

67. Section 47 provides, *inter alia*, that:

> "(1) Ofcom must not, in exercise or performance of any power or duty under this Chapter—
>
> (a) set a condition under section 45, or

(b) modify such a condition,

unless they are satisfied that the condition or (as the case may be) the modification satisfies the test in subsection (2).

(2) That test is that the condition or modification is—

(a) objectively justifiable in relation to the networks, services, facilities, apparatus or directories to which it relates (but this paragraph is subject to subsection (3));

(b) not such as to discriminate unduly against particular persons or against a particular description of persons;

(c) proportionate to what the condition or modification is intended to achieve; and

(d) in relation to what it is intended to achieve, transparent."

68. The "SMP conditions" which may in principle be imposed under section 45 are those which are authorised or required by one or more of sections 87 to 92. Of relevance in these proceedings are sections 87 and 88. Section 87 contains powers, *inter alia*, to require a CP with SMP to provide access to its network and impose price controls. Section 88 limits the circumstances in which a price control can be imposed, to ensure that they are imposed only where to do so is appropriate.

(3) Guidance documents

69. Four guidance documents were referred to in the course of submissions. These were:

(1) The Commission Notice on the definition of the relevant market for the purposes of Community competition law (1997/C 372/11), 9 December 1997 (the **"Notice on Market Definition"** or **"Notice"**).

(2) The Commission guidelines on market analysis and the assessment of significant market power under the Community regulatory framework for electronic communications networks and services (2002/C 165/03), 11 July 2002 (the **"SMP Guidelines"**).

(3) The Office of Fair Trading's market definition guidance, OFT403, 1 December 2004 (the **"OFT Guidance"**).

(4) The BEREC Common Position on geographical aspects of market analysis (definition and remedies) (the **"BEREC Common Position"**).

We shall refer to relevant parts of these guidance documents as required in this ruling.

(4) Review in the Tribunal

(a) Burden and standard of proof

70. In a regulatory appeal, the burden of proof is borne by the appellant who seeks to establish that the regulator has erred in its decision. The Tribunal applies the usual civil standard when assessing evidence and finding facts, namely the balance of probabilities.

(b) The role of the Tribunal

71. Section 192 of the 2003 Act explains what decisions are appealable to the Tribunal. Section 192(6) provides that the grounds of appeal must be set out in sufficient detail to indicate: (a) to what extent, if any, the appellant contends that the decision appealed against was based on an error of fact or was wrong in law, or both; and (b) to what extent, if any, the appellant is appealing against the exercise of a discretion by Ofcom, or others.

72. Section 195(2) of the 2003 Act sets out the Tribunal's task on an appeal under section 192. It provides that the Tribunal must decide the appeal "on the merits" and by reference to the grounds of appeal set out in the notice of appeal. That reference to an appeal "on the merits" reflects the terms of Article 4(1) FD which provides:

> "Member States shall ensure that effective mechanisms exist at national level under which any user or undertaking providing electronic communications networks and/or services who is affected by a decision of a national regulatory authority has the right of appeal against the decision to an appeal

> body that is independent of the parties involved. This body, which may be a court, shall have the appropriate expertise to enable it to carry out its functions effectively. Member States shall ensure that the merits of the case are duly taken into account and that there is an effective appeal mechanism."

73. In *British Telecommunications plc v Telefonica O2 Ltd & Ors* [2014] UKSC 42 at [24], Lord Sumption (with whom all the other members of the Supreme Court agreed) explained that:

> "Under section 192 of the Communications Act 2003, an appeal to the CAT is an appeal on the merits. It is a rehearing, and is not limited to judicial review or to points of law. This reflects the requirements of Article 4 of the Framework Directive."

74. The detailed approach to appeals on the merits under section 192 has been the subject of consideration in a number of decisions. In *British Telecommunications Plc v Office of Communications* [2010] CAT 17 at [69] – [78] the Tribunal stated:

> "70 […] the first limb of section 193(2) quite clearly requires that the appeal be conducted "on the merits" and not in accordance with the rules that would apply on a judicial review. This point was very clearly made in *Hutchison 3G UK Limited v Office of Communications* [2008] CAT 11 at paragraph [164]:
>
> > "However, this is an appeal on the merits and the Tribunal is not concerned solely with whether the 2007 Statement is adequately reasoned but also with whether those reasons are correct. The Tribunal accepts the point made by H3G in their Reply on the SMP and Appropriate Remedy issues that it is a specialist court designed to be able to scrutinise the detail of regulatory decisions in a profound and rigorous manner. The question for the Tribunal is not whether the decision to impose a price control was within the range of reasonable responses but whether the decision was the right one."
>
> We consider that this correctly states the legal consequences of section 193(2).
>
> 71 That said, Jacob LJ in *T-Mobile (UK) Limited v Office of Communications* [2008] EWCA Civ 1373 made absolutely clear that the section 192 Appeal Process is not intended to duplicate, still less, usurp, the functions of the regulator. In paragraph [31], he stated:
>
> > "After all it is inconceivable that Article 4 [of the Framework Directive], in requiring an appeal which can duly take into account the merits, requires Member States to have in effect a fully equipped duplicate regulatory body waiting in the wings just for appeals. What is called for is an appeal body and no more, a body which can look into whether the regulator had got something materially wrong. That may be very difficult

> if all that is impugned is an overall value judgment based upon competing commercial considerations in the context of a public policy decision."
>
> […]
>
> 76 By section 192(6) of the 2003 Act and rule 8(4)(b) of the 2003 Tribunal Rules, the notice of appeal must set out specifically where it is contended Ofcom went wrong, identifying errors of fact, errors of law and/or the wrong exercise of discretion. The evidence adduced will, obviously, go to support these contentions. What is intended is the very reverse of a *de novo* hearing. Ofcom's decision is reviewed through the prism of the specific errors that are alleged by the appellant. Where no errors are pleaded, the decision to that extent will not be the subject of specific review. What is intended is an appeal on specific points.
>
> 77 The nature of the appeal before the Tribunal is similarly made clear in sections 193(3) and (4) of the 2003 Act. These sections make plain that it is not for the Tribunal to usurp Ofcom's decision-making role. The Tribunal's role is <u>not</u> to make a fresh determination, but to indicate to Ofcom what (if any) is the appropriate action for Ofcom to take in relation to the subject-matter of the decision under appeal and then to remit the matter <u>back</u> to Ofcom."
>
> (Emphasis in original.)

75. These paragraphs were referred to with approval by the Tribunal in *British Sky Broadcasting Ltd and ors v Ofcom* [2012] CAT 20, an appeal from a decision under section 316 of the 2003 Act. At [76] the Tribunal then observed, in relation to appeals concerning findings of fact:

> "It is clear (and appears to be common ground) that in a case such as this the Tribunal has jurisdiction to assess and find the facts in so far as they are relevant to the grounds of appeal, and must do so in the light of the admissible material that is before it. If, having evaluated the evidence, the Tribunal finds that a material finding of fact made by Ofcom is wrong, then it must so hold and proceed accordingly. Although a finding of fact obviously involves an evaluation of the evidence, this is not an exercise of discretion, and there is no margin of appreciation (as that notion is generally understood in this context) in relation to such findings, any more than for decisions on points of law."

76. So far as appeals against the exercise of discretion or judgement by Ofcom is concerned, and having reviewed a number of authorities the Tribunal continued, at [84]:

> "Having regard to the parties' submissions and the authorities to which our attention was drawn, we consider that the following principles should inform our approach to disputed questions upon which Ofcom has exercised a judgment of the kind under discussion:

(a) Since the Tribunal is exercising a jurisdiction "on the merits", its assessment is not limited to the classic heads of judicial review, and in particular it is not restricted to an investigation of whether Ofcom's determination of the particular issue was what is known as *Wednesbury* unreasonable or irrational or outside the range of reasonable responses.

(b) Rather the Tribunal is called upon to consider whether, in the light of the grounds of appeal and the evidence before it, the determination was wrong. For this purpose it is not sufficient for the Tribunal simply to conclude that it would have reached a different decision had it been the designated decision-maker.

(c) In considering whether the regulator's decision on the specific issue is wrong, the Tribunal should consider the decision carefully, and attach due weight to it, and to the reasons underlying it. This follows not least from the fact that this is an appeal from an administrative decision not a *de novo* rehearing of the matter, and from the fact that Parliament has chosen to place responsibility for making the decision on Ofcom.

(d) When considering how much weight to place upon those matters, the specific language of section 316 to which we have referred, and the duration and intensity of the investigation carried out by Ofcom as a specialist regulator, are clearly important factors, along with the nature of the particular issue and decision, the fullness and clarity of the reasoning and the evidence given on appeal. Whether or not it is helpful to encapsulate the appropriate approach in the proposition that Ofcom enjoys a margin of appreciation on issues which entail the exercise of its judgment, the fact is that the Tribunal should apply appropriate restraint and should not interfere with Ofcom's exercise of a judgment unless satisfied that it was wrong."

77. These observations were expressly endorsed on appeal: see *British Telecommunications plc v Ofcom and others* [2014] EWCA Civ 133 at [88] per Aikens LJ. They have also since been adopted in other Tribunal decisions under section 192 of the 2003 Act: see e.g. *British Telecommunications plc v Ofcom* [2014] CAT 14 at [62]-[67].

78. Of themselves, these statements of principle do not fully explain what the Tribunal is to do if it finds an error in the facts or law upon which a decision was based, or (exercising sufficient restraint) is satisfied that an exercise of judgement was wrong. The answer is that the Tribunal must also be satisfied that the decision itself cannot stand in light of that error and that it cannot be supported on some other ground. This follows from the judgment of Moses LJ in *Everything Everywhere Ltd v Competition Commission (Mobile Call Termination)* [2013] EWCA Civ 154 at [23]-[24]:

> "23 It is for an appellant to establish that Ofcom's decision was wrong on one or more of the grounds specified in s.192(6) of the 2003 Act: that the decision was based on an error of fact, or law, or both, or an erroneous exercise of discretion. It is for the appellant to marshal and adduce all the evidence and material on which it relies to show that Ofcom's original decision was wrong. Where, as in this case, the appellant contends that Ofcom ought to have adopted an alternative price control measure, then it is for that appellant to deploy all the evidence and material it considers will support that alternative.
>
> 24 The appeal is against the decision, not the reasons for the decision. It is not enough to identify some error in reasoning; the appeal can only succeed if the decision cannot stand in the light of that error […] If the Commission (or Tribunal in a matter unrelated to price control) concludes that the original decision can be supported on a basis other than that on which Ofcom relied, then the appellant will not have shown that the original decision is wrong and will fail."

79. Moses LJ also went on, at [25], to consider how an appellant might seek to discharge the burden upon it, and to outline the options open to the Tribunal in the event that the appellant succeeded:

> "25 Usually an appellant will succeed by demonstrating the flaws in the original decision and the merits of an alternative solution. But that is not necessarily so. I would not rule out the possibility that there could be a case where an appellant succeeds in so undermining the foundations of a decision that it cannot stand, without establishing what the alternative should be. In such a case, if there is no other basis for maintaining the decision, the Commission or Tribunal would be at liberty to conclude that the original decision was wrong but that it could not say what decision should be substituted. The Tribunal would then be required to allow the appeal under s.195(2) and direct Ofcom to make a fresh decision with such directions as the Tribunal thinks are necessary to reach a properly informed conclusion. The Tribunal may wish to specify the steps to be taken by Ofcom to make good any deficit in evidence and material so as to reach a fresh decision, or leave it to Ofcom to act as it sees fit in the light of the Commission's conclusion."

(c) New evidence

80. As we shall explain later in this judgment, after the Final Statement had been issued and during the course of the appeal proceedings, it emerged that an important piece of factual information supplied to Ofcom by BT during the BCMR process, and upon which it became apparent that Ofcom had placed significant reliance in coming to its decision on market definition, had been wrong. Ofcom raised no objection to the admission of evidence from BT explaining the error and showing what it contended that the correct position

was: Ofcom did, however, submit that its product market decision was correct on either basis.

81. The explanation for Ofcom's position on the question of admission of new evidence is to be found in the following extracts from the judgment of Toulson LJ in the Court of Appeal in *British Telecommunications plc v Ofcom* [2011] EWCA Civ 245 at [60] – [71],

> "60 The task of the appeal body referred to in article 4 of the Framework Directive is to consider whether the decision of the national regulatory authority is right on "the merits of the case". In order to be able to make that decision the Framework Directive requires that the appeal body "shall have the appropriate expertise available to it". There is nothing in article 4 which confines the function of the appeal body to judgment of the merits as they appeared at the time of the decision under appeal. The expression "merits of the case" is not synonymous with the merits of the decision of the national regulatory authority. The omission from article 4 of words limiting the material which the appeal body may consider is unsurprising. When an appeal body is given responsibility for considering the merits of the case, it is not typically limited to considering the material which was available at the moment when the decision was made. There may be powerful reasons why an appeal body should decline to admit fresh evidence which was available at the time of the original decision to the party seeking to rely on it at the appeal stage, but that is a different matter."
>
> […]
>
> 70 Under article 4 of the Framework Directive, the appeal body is concerned not merely with Ofcom's process of determination but with the merits. Ofcom is not only an adjudicative but an investigative body, and the appellant may wish to produce material, or further material, to rebut Ofcom's conclusions from its investigation. It is unsurprising that the CAT should adopt a more permissive approach towards the reception of fresh evidence than a court hearing an appeal from a judgment following the trial of a civil action. Indeed, as Sullivan LJ observed, the appeal body might in some cases expect an appellant to produce further material to address criticisms or weaknesses identified by Ofcom.
>
> 71 Ofcom submitted in its skeleton argument that an unfettered right to adduce fresh evidence on appeal might cause parties to avoid proper engagement with Ofcom during the dispute resolution process. No party has an unfettered right to adduce fresh evidence on an appeal to the CAT, and there is force in Ms Rose's argument that parties ought to be encouraged to present their case to Ofcom as fully as the circumstances permit. That is a factor, among others, to be borne in mind by the CAT when considering the discretionary question whether to admit fresh evidence. Other relevant factors would include the potential prejudice (in costs, delay or otherwise) which other parties may suffer if an appellant is permitted to introduce material that it could reasonably have been expected to place before Ofcom. These are not necessarily the only relevant factors."

We shall return to consider the consequences of the erroneous evidence provided by BT to Ofcom in greater detail later in this judgment.

(d) Standard applicable in future appeals

82. For completeness, we note that the 'on the merits' standard of review will no longer apply to appeals from decisions of Ofcom made on or after 1 August 2017 owing to the coming into force of section 87 of the Digital Economy Act 2017, which was brought into effect by the Digital Economy Act 2017 (Commencement No. 1) Regulations 2017 (2017 S.I. 675). In future, such decisions will be determined by the Tribunal applying the same principles as would be applied by a court on an application for judicial review.

D. WITNESSES AND EVIDENCE

(1) Factual evidence

83. A total of 11 factual witnesses gave evidence, and all but one (Mr Baxter) was called for cross-examination. BT called Mr Andy Reid, Mr Mark Logan and Mr David Beal. Ofcom called Mr Gideon Senensieb. VM called Mr Duncan Higgins. The CP Group called Mr Mark Allinson and Mr Alexander Connors (both of Vodafone), Mr Barnaby Lane (Colt), Mr Simon Pilsbury (TalkTalk) and Mr Graham Baxter (Three). Finally, Gamma called Mr Peter Farmer.

84. As a rule, but subject to the general comments which we make in section D(3) below, we found all of the factual witnesses to be credible and reliable. We would, however, add the following brief comments:

(1) Mr Logan (Director of Fibre Products within Openreach) at times (certainly early in his cross-examination) appeared rather defensive and intent upon advancing BT's case when answering questions.

(2) Mr Higgins (Director of Marketing and Digital at Virgin Media Business) has a role that covers product management, marketing, price setting and brand development for leased lines and other business products. He did not appear to have a firm grasp of various technical matters, and in parts it seemed that his written evidence was overstated and could not be defended under cross-examination. As a result we did not find his evidence to be entirely reliable.

(3) Mr Connors (Head of Fixed Connectivity Services at Vodafone) relied upon written evidence that was shown to contain certain errors. To his credit, however, he was ready to acknowledge those errors in cross-examination.

(2) Expert evidence

85. We heard from the following witnesses who were put forward as (in whole or in part) as expert witnesses:

BT

86. Dr Matt Yardley. Dr Yardley works for Analysys Mason, a management consultancy and research company. Dr Yardley is head of Analysys Mason's Manchester Office and a member of the company's senior management team. Dr Yardley advises companies on a wide range of issues relating to fixed networks. We thought that Dr Yardley was somewhat defensive initially, and that on occasions he gave evidence on economics which fell outside his area of expertise. Overall, however, we found his evidence to be reliable and of assistance.

87. Dr Bruno Basalisco. Dr Basalisco is an economist working as a consultant at Copenhagen Economics. Dr Basalisco provided three lengthy reports focussed on the issues of market definition and BT's core conveyance network. It appeared to us that Dr Basalisco lacked the objectivity and balance required of an independent expert witness. Rather than explaining the relevant economic principles in neutral or objective terms for our assistance, Dr Basalisco's written material was couched throughout as a one-sided argument and critique of Ofcom's reasoning and approach. Moreover, whilst Dr Basalisco exhibited an impressive recall and command of the written materials, in cross-examination we thought that he was intent on seeking to promote BT's case by advancing arguments, rather than simply answering the questions he had been asked. Accordingly, we regret that we were not assisted by much of Dr Basalisco's evidence.

88. Two examples will suffice to illustrate our point. In his first report, under the heading "The hypothetical monopolist in a multi-product industry benefits from SSNIP-induced migration across products" Dr Basalisco advanced a theory as to how Ofcom should have applied the hypothetical monopolist test. He said:

> "270. In addition, Ofcom is wrong in considering that upwards migration is a demand constraint for the pricing of Medium or High CISBO products. One must not forget that upwards migration of end users' needs' is actually a boon for the industry supplying wholesale leased lines - infrastructure-based operators which are multi-product firms selling both the products end users migrate from and migrate to.
>
> 271. Thus, it is not factually or conceptually consistent to portray upwards migration in user needs as an additional demand constraint: neither for each of the current infrastructure-based operators nor for the entire set of these operators (considered together as the hypothetical monopolist). All else equal, upward migration of customer needs enables each firm (and the hypothetical monopolist) to increase prices for Medium or High CISBO products, since promoting buyers' trading up leads to higher profits for multi-product suppliers.
>
> 272. In the previous subsection, I quantified the effect of migration as a very small volume effect. In this section, I argue that this very small effect actually has the opposite implication for the purpose of product market definition than what Ofcom considered. This effect of upward migration increases the case for CISBO medium or High products to be a market worth monopolising i.e. a separate product market distinct from 10Gb - the opposite of Ofcom's interpretation of the effect of upward migration of user needs.
>
> 273. The argument in this subsection is logically consistent with market features recognised by Ofcom, i.e. the multi-product nature of fibre networks. Thus, when defining the hypothetical monopolist e.g. of 1Gb Ethernet products it is strictly necessary (even if superficially counterintuitive) to consider that the very same hypothetical monopolist is also the supplier of 10Gb lines and thus earns the revenues after trading up is induced by the SSNIP. The hypothetical monopolist benefits from up-selling in the same way that each individual supplier of wholesale leased lines does when a price increase promotes end user migration to a higher service level."

89. In cross-examination, Dr Basalisco adhered to this opinion, which he expressed without qualifying it in any way, volunteering that he thought that the contrary approach taken by Ofcom's witness, Ms. Curry, was "absurd". However, it became apparent that Dr Basalisco's argument was unsupported by any authority or guidance and had never been adopted by any competition authority or regulator. If attempting to give independent expert evidence for the assistance of the Tribunal, we think that Dr. Basalisco ought at very least to have drawn this important factor to our attention:

> **Q (Mr Holmes)** You say there that when defining the hypothetical monopolist, it is strictly necessary, even if superficially counter-intuitive, to consider that the very same hypothetical monopolist is also the supplier of lOG lines and thus earns the revenues after trading-up is induced by a SSNIP. That is your position, is it not?
>
> **A (Dr Basalisco)** Yes, in this context, that is my position.

Q (Mr Holmes) This is a case of "heads I win, tails you lose". The hypothetical monopolist picks up the sales at 10G which it loses at 1G. Is that right?

A (Dr Basalisco) I think in this market, given the nature of the product and infrastructure used to provide it, assuming otherwise, which is what Curry has done in the report, is an assumption which is disconnected by the fact that it is absurd and does not hold. Upon reflection, this reflection is both in Basalisco 1 and Basalisco 3. I have chosen what I think is the safest option to ---

Q (Mr Holmes) So the 10% price increase at 1G might actually lead the hypothetical monopolist to benefit from the sales which it lost in response as a result of substitution to its 10G product. Is that right?

A (Dr Basalisco) For the reason that suppliers individually in this market also supply at 1GB, and in the and next behind Basalisco report 1, I have checked that all key suppliers listed by Ofcom supply both 1G product and VHB product, therefore their commercial incentives are to promote migration up. It is an industry boon. It is an advantage for each individual supplier, and suppliers taken together, that customers move to more expensive products and faster products. They all welcome that individually. They also welcome it in the guise of the hypothetical monopolist. Assuming otherwise, which is what Curry does, implicitly or explicitly, to me is absurd and does not capture in this market, specifically at 1G to 10G, not perhaps at the bottom of the market, what is the reality of the competitive constraints faced by a supplier individually or taken as a hypothetical monopolist.

Q (Mr Holmes) There is no distinction on that approach between the focal product and the main substitute product. They are both supplied by the same hypothetical monopolist supplier. That is your position.

A (Dr Basalisco) My position is that it is not tenable to assume otherwise. It is not tenable to assume that there is a company that supplies l0G using not yet a clear infrastructure that is not also a member of the hypothetical monopolist at 1G, because it is fibre infrastructures that allow the nature of this product to be -- it is the nature of the product.

Q (Mr Holmes) Just to situate this, you would accept there is no support for your approach in any of the guidance on market definition.

A (Dr Basalisco) I would say that the guidance is silent on this point. Perhaps this specific market context is not a general situation in many markets. Indeed, in the bottom end of BCMR, I think if we were to do a

SSNIP on 10Mb, for instance –

Q (Mr Holmes) I think you are straying from my question, Dr. Basalisco. My question was simply, is there any support for this approach in any of the guidance on market definition? I think your answer is they are silent on the point. Is that correct?

A (Dr Basalisco) Yes.

Q (Mr Holmes) And you agree that in the relevant guidelines, the assessment is framed purely in terms of balancing the greater profits made on the retained sales of the focal product against the profits lost to substitutes. That is correct, is it not?

A (Dr Basalisco) The focus is on whether there are profits being lost. That is what we are discussing now.

Q (Mr Holmes) You are not aware of any instance of a regulator or competition authority ever having presumed that the hypothetical monopolist also monopolized products other than the focal product, are you?

A (Dr Basalisco) No.[8]

90. Dr. Basalisco then sought to argue what he perceived to be the facts of the case in spite of it being pointed out to him that the hypothetical monopolist test is a thought experiment rather than a reality-based test:

Q (Mr Holmes) And the purpose of the SSNIP test is that it is an abstraction. It is, by its nature, a departure from reality. You are assuming in relation to a market with plural suppliers that for the focal product there is only one supplier. It is, by its nature not the real world. Would you accept that?

A (Dr Basalisco) I would only accept that the purpose of assuming a hypothetical monopolist is to eliminate the effect of churn, the effect of one customer responding to 10% price increase from a supplier by going to another supplier of the same 1G product. That is what is then looked at later on in terms of the market power assessment and all the following stages of analysis. For the purpose of market definition, that is the only one we need to assume away. Then we need to look at the reality of what are the incentives. Is there anything that constrains the discipline, the pricing, the 10% price increase, of suppliers of a 10 product? If we were to merge together all the companies that supply wholesale lease lines, BT, Virgin Media, CityFibre, and all those—if we were to merge together into an industry board all the wholesale suppliers of lease lines, BT, Virgin Media, CityFibre, would they be

[8] T10P/15-20.

> disciplined by the 10G product if they were to raise collectively as a joint entity the price of 1G? They would be laughing all the way to the bank. They would be happy to promote migration of customers. They would not be disciplined in the supply and pricing of 1G by the existence of the l0G product. The same question with 10MB would give a different answer. My point is not a generally applicable point, but it refers to the specific reality of this market […].[9]

91. The second example of Dr Basalisco making submissions rather than giving evidence concerned the section of his third report headed "Limited relevance of the Aberdeen Journals precedent, given the facts of this appeal". He stated:

> "75. I believe that, in the context of the BCMR, Ofcom finds itself in a more favourable position as regard evidence gathering than that faced by many other agencies that are required to undertake market definition exercises. In particular, Ofcom has a relatively long time to carry out evidence gathering, access to evidence from a wide range of market participants (which may not be the case in a discrete competition investigation) and the benefit of experience from past BCMRs, which allow it to adapt its analytical techniques in light of what has and has not worked well in the past. Ofcom also benefits from wide-ranging and intrusive information gathering powers that legally oblige market participants to respond to its information requests.
>
> 76. Thus, it is somewhat surprising to see considerable effort in Ofcom's Defence in explaining why it was appropriate for Ofcom not to rely on evidence, especially quantitative evidence, in the context of the BCMR.
>
> 77. The Defence §156 goes as far as making the remarkable statement that one of Ofcom's commissioned surveys (the 2016 BDRC Survey) "was not intended to be used for a quantitative analysis". This statement refers to a 90-page survey which sought and reported a large amount of statistics and quantitative information. In particular, this survey provides the results of Ofcom's own-commissioned SSNIP questions (results of questions named in the survey as SSNIP1, SSNIP2, SSNIP3, SSNIP4, see BDRC 2016 Survey, pp. 56-59 in the section named "Hypothetical price increases").
>
> 78. Ofcom's Defence §175 refers to the Aberdeen Journals CAT precedent and states that the value of quantitative analysis depends on the facts. I re-state below the factors stated in Aberdeen Journals which in that case drove the choice not to rely on survey-based and other quantitative analyses of substitutability, deemed (i) not to be robust enough and; (ii) unnecessary given the availability of other sufficient sources of evidence. I then compare the factors in the Aberdeen Journals case with the situation in this appeal.
>
> 79. I consider that the case specific factors that drove the DGFT/OFT and CAT to conclude that survey-based evidence was not reliable in Aberdeen

[9] T10P/20-21.

> Journals are mainly not relevant for the BCMR case. I concluded this on the basis of the analysis presented in Appendix, which includes:
>
> - A Box highlighting the key paragraphs in Aberdeen Journals on the value of and limitations of quantitative analysis for the purpose of market definition
>
> - A Table comparing factors limiting the availability of reliable economic evidence in Aberdeen Journals vs BCMR
>
> 80. My review of the relevant facts of the case in Aberdeen Journals vs. this appeal concludes that quantitative data and analysis relevant to Ofcom's BCMR market definition are not affected by the same type of bias and the same extent of unreliability as was the case in Aberdeen Journals for the DGFT/OFT. Thus, insofar as Ofcom relies on Aberdeen Journals as a relevant precedent, this may be severely impaired by the facts of the BCMR case."

92. The Table referred to in the second bullet of para 79, is labelled "Supporting arguments".

93. The Table provided as follows:

Table 1: Dr Basalisco's "Comparison of factors limiting the availability of reliable economic evidence in Aberdeen Journals vs BCMR (Table 4 of Appendix to Basalisco 3)

DGFT concern in Aberdeen Journals	Situation before Ofcom in BCMR	Conclusion for the BCMR
Prices below competitive level (shown by prices below average variable cost)	Supply is either informed by ex-ante price controls regulation or unregulated prices based on past finding of a competitive market. No allegations of prices below the competitive level (no concern of "reverse cellophane fallacy" and thus no concern of too narrow product market). Openreach is also bound by the Equivalence of Input regulatory obligation.	The Aberdeen Journals concern is not relevant for the BCMR
Prices are not transparent	BT's regulated prices are subject to detailed transparency regulatory obligations. OCPs' prices are rarely published, yet Ofcom has gathered info on these and relies on them. Moreover, wholesale leased line buyers routinely gauge OCPs' and all BT's prices as part of their procurement / tendering process.	Ofcom has access to better price information than DGFT did
Extensive discounting	BT's regulated prices are subject to obligations preventing discounting, except for a volume discount schedule. While OCPs' price discounting may be confidential, Ofcom has access to price information. Moreover, wholesale leased lines buyers are mainly professional buyers which gather information on all CPs' discounting practices as part of their negotiations and procurement / tendering process.	Ofcom has access to better price information than DGFT did
Prices may be bundled	BT's regulated prices are subject to obligations preventing bundling. While OCPs' price bundling may be confidential, Ofcom has access to price information. Moreover, wholesale leased lines buyers are mainly professional buyers which gather information on all CPs' bundling practices as part of their negotiations and procurement / tendering process.	Ofcom has access to better price information than DGFT did
Customer may react to price rises by altering the balance of their spending between different suppliers rather than switching outright	This concern seems related to the validity of the RBB survey data interpretation in Aberdeen Journals. In BCMR, while buyers of wholesale leased lines can and do procure from multiple suppliers, the buyers' demand cannot be merely represented as a "portfolio" allocation but rather as a link-by-link decision on which supplier provides which link (based on availability, distance, cost). Ofcom has detailed, granular data on each supplier's sale by location (i.e. broken down by the link ends, the basic client demand component)	Different market context. Ofcom has access to more detailed data than DGFT did
Time-series statistical analysis conducted and failed	No comparable time-series analysis conducted in BCMR to assess substitution patterns. Ofcom limited itself to a simple snapshot (not time-series) incomplete survey of business access customers.	Lower complexity in Ofcom's survey data than the DGFT statistical analysis
Lack of sufficiently detailed product supply data from one key supplier for the period covered by the statistical analysis	Ofcom has exercised its S135 powers and has issued a significant number of requests for information to BT and all key CPs including Virgin Media, Talk Talk etc. to gather product supply data. This data covers the entire period in the review cycle.	Ofcom, as a regulator, has over time secured access to better supply data than DGFT had
Market conditions were already distorted, meaning that extreme caution must be exercised when dealing with the presence or absence of switching patterns	Market conditions in BCMR are orderly, due to regulation and competition. In particular, no evidence of distortion of market conditions – in particular, no evidence of foreclosing abuse (e.g. predatory pricing). The leased lines market is subject to regulatory safeguards (incl. price floors and caps), with obligations imposed on many products since the Oftel 2001 PPC direction on leased lines.	No market conditions-based reason for caution when dealing with switching patterns
Force of other evidence already analysed (evidence in documentary form, supplemented by witness statements)	Many key alternative pieces of evidence considered by Ofcom have been disputed. This report (as well as other reports) have identified several elements of the FS (as to its interpretation of evidence) to be scrutinised.	No rationale for not seeking or not relying on economic evidence

Source: First column: [2003] CAT 11 (Aberdeen Journals), §260, §262. Rest of the table: my analysis.

94. This entire text was pure argument and did not relate to any matters that properly fell into the scope of an expert witness on economics. Whilst it is not surprising that Dr Basalisco should be familiar with Ofcom's defence and, indeed, the Tribunal's case law, including the *Aberdeen Journals* case, it is clearly inappropriate for an expert witness to seek to "fight back" against a pleading and do so by reference to an entirely unrelated dispute.

Ofcom

95. Ms Katie Curry. Ms Curry works for Ofcom as an Economic Director. Ms Curry provided two reports which focussed on the issues of market definition and BT's core conveyance network. Ms Curry's reports also openly acknowledged that, in part, they contained factual evidence as to how Ofcom had reached its decisions in the Final Statement, with which she had clearly been closely involved. Ms. Curry explained that she started working on the BCMR after the close of the consultation in May 2015 and that in her role she "oversaw the economics analysis that informed Ofcom's market definition analysis as part of the BCMR."

96. In part, therefore, Ms. Curry is properly to be regarded as a witness of fact. We do not doubt that Ms. Curry also had the necessary qualifications and experience to be an expert witness on economic issues. We also thought that she gave her evidence honestly and conscientiously, and that she was seeking as best she could to assist the Tribunal in an impartial manner. But we nevertheless felt that the fact that Ms. Curry was attempting to perform the multiple roles of giving factual evidence as to a decision with which she had been involved, answering BT's arguments and criticisms of that decision, and giving expert opinion evidence on economic issues, meant that it was often difficult to distinguish which role Ms. Curry was performing. It also meant that to some extent (though far less than Dr. Basalisco) Ms. Curry tended to be an advocate for Ofcom's cause.

97. So, for example, the way in which Ms. Curry's written evidence contained both factual evidence and argument was illustrated by the following exchange in relation to Ms. Curry's statement concerning the outcome of a SSNIP test at 10G:

> **Q (Mr Beard)** [In] Paragraph 61 [of your report] you say: "I also consider that the evidence Ofcom presented, taken in the round, suggests a SSNIP on 10Gbit/s Ethernet connections would be likely to be rendered unprofitable by the constraint from lower bandwidth Ethernet connections (and particularly 1Gbit/s Ethernet services). I consider this constraint would be likely to come from the following sources…". Again, this is not language

or a conclusion we find in the final statement, is it?

A (Ms Curry) No. Again, I was re-presenting the focus of the analysis in response to BT's appeal. The presentation in the final statement reflects my discussion earlier about what I see as the core essence of the market definition question, which is whether two products are sufficiently substitutable to be considered within the same relevant market. BT takes a special focus on the implementation of the SSNIP and so I have reformulated the evidence to more clearly address BT's concerns in relation to the SSNIP. [10]

98. Likewise the way in which Ms. Curry's cross-examination blurred the boundaries between factual evidence, expert evidence and argument can be illustrated from an exchange concerning the appropriate period of time over which to apply the hypothetical monopolist test. Ms. Curry first gave evidence as to what Ofcom had done. She was then asked a question from the Tribunal which invited a general answer, which she initially answered on the basis of her expertise, but she then reverted to giving her own assessment of the evidence upon which Ofcom relied:

Q (Mr Beard) We have been referring to the time period within which you take into account switching and I would suggest to you that the relevant time period should be one year. Do you accept that in this case?

A (Ms Curry) No, I am not sure that I do. I think in the first instance what you are talking about is the time period over which you would quantify a SSNIP calculation. I think when Ofcom was looking at migration, it was looking at the number of users over the period covered by this review who would be choosing between 1G and 10G and whose decision would therefore be affected by the relative prices of those services. Ofcom did not, as we know, do a quantified SSNIP calculation. I think it was appropriate when considering migration for Ofcom to look at the three-year period covered by this review because it is required to adopt a forward-looking review and to adopt a market definition that is relevant for the whole period covered by this review. Even within the context of a quantified SSNIP calculation, whilst I can see that the OFT suggests it is a rough rule of thumb that a year might be appropriate, I

[10] T12/1160.

	can also see that in this specific industry there may be reasons to adopt a longer time period.
Q (Mr Beard)	Does the final statement indicate what time period was being used?
A (Ms Curry)	No. Ofcom did not conduct a quantified SSNIP calculation, so that was not a relevant consideration. It was clear that it was looking at migration over the period covered by this review, and I think that was the appropriate time period for Ofcom to look at.
Q (Mr Beard)	Does that effectively mean that the final statement should be read as treating the relevant period as being three years?
A (Ms Curry)	The relevant period for what?
Q (Mr Beard)	Any relevant switching for the assessment of a SSNIP test?
A (Ms Curry)	I do not think necessarily. It was not a question that Ofcom considered, the exact time frame that would be relevant to a quantified SSNIP test, because it did not conduct one. It did look at substitutability between 1G and 10G over the period as a whole and it was relevant to do so given the time period covered by this review.
Q (Professor Cubbin)	I am sorry, I am not clear. Are you saying that it is only where you do a quantified SSNIP test that you need even consider what the relevant period should be?
A (Ms Curry)	I think you would need to consider that substitution would be sufficiently timely so as to affect the pricing decision of a hypothetical monopolist. We have seen evidence that BT was taking into account the substitution from 1G to 10G when setting the price of its 10G service. So I think that evidence strongly suggests that the time period over which substitution was likely to occur would be a sufficient constraint [sic]. I am saying that I do not think Ofcom needed to consider it in more detail than that.[11]

99. A similar point can be made in relation to Ms. Curry's evidence concerning the design of the Boundary Test and its orgins in the BCMR 2008 to which reference is made in paragraphs 406ff below.

100. As a consequence, we approach Ms. Curry's expert evidence with a degree of caution.

[11] T12/1145-1148.

Virgin Media

101. Mr Chris Osborne. Mr Osborne is an economist and is the Global Segment Leader of FTI Consulting's Economic Consulting segment. Mr Osborne provided a single expert report which focussed solely on the question of geographic market definition. Mr Osborne gave clear, crisp evidence, making sensible concessions where appropriate. We found him to be a helpful and straightforward witness.

(3) Remarks on the evidence in this appeal

102. Having set out our brief impressions of the witnesses, we wish to place on record two general points regarding the evidence.

103. The first is that we were not remotely assisted by the length and tone of much of the written evidence and expert reports with which we were assailed. Whilst we appreciate that Ofcom's Final Statement was itself a vast document, and the issues with which it deals are complex, we thought that much of the written material, in particular from BT, was excessively prolix and argumentative. At times, that written material also sought to reopen old (and irrelevant) battles. This style of written statement inevitably tended to obscure rather than enlighten, and led to cross-examination which strayed into argument.

104. In saying this, we appreciate that the regulatory environment of the BCMR cycle is very different from the situation that prevails in ordinary commercial litigation. The questions to be answered necessarily concern looking into the future rather than simply looking at events that have happened in the past. Moreover, the personnel who give evidence are very likely to have been closely involved on behalf of their employer over several cycles of consultation and the litigation that appears inevitably to follow a regulatory decision in the telecommunications field. This may make it very difficult for such witnesses to distinguish between the submissions that they have been involved in preparing or receiving during the BCMR process, and the relevant factual evidence that they have to give on an appeal.

105. That said, in principle there should be no difference in the content of witness statements of fact used in the Tribunal proceedings and those used in ordinary commercial litigation. Such statements should in general only contain evidence that the witness would be allowed to give orally, and witnesses should not engage in matters of argument: see *JD Wetherspoon plc v Harris* [2013] 1 WLR 3296 and words to similar effect at paragraph 7.61 of The Tribunal's Guide to Proceedings 2015.

106. The second point arises from the comments which we have made regarding the evidence of Dr. Basalisco and Ms. Curry. As Cresswell J made clear in *The Ikarian Reefer* [1993] 2 Loyds Rep 68 at 81-82, an expert witness in civil proceedings should provide independent assistance to the court by way of objective unbiased opinion in relation to matters within his or her expertise, and should never assume the role of an advocate.

107. Those requirements are reflected in paragraph 11 of CPR Practice Direction 35, which states:

> "Experts must provide opinions that are independent, regardless of the pressures of litigation. A useful test of 'independence' is that the expert would express the same opinion if given the same instructions by another party. Experts should not take it upon themselves to promote the point of view of the party instructing them or engage in the role of advocates."

108. To similar effect is paragraph 7.67 in The Tribunal's Guide to Proceedings 2015, which states:

> "[…] Expert evidence presented to the Tribunal should be, and should be seen to be, the independent product of the expert uninfluenced by the pressures of the proceedings. An expert witness should never assume the role of an advocate […]."

109. As regards Ms. Curry's position, we note that in *Field v Leeds CC* [2000] 32 HLR 618 the Court of Appeal accepted in principle that provided that the court was satisfied that a witness was properly qualified to act as an expert, and that the party calling him could show that the witness had full knowledge of the need for objectivity, the mere fact that the witness was employed by one of the parties to proceedings would not prevent him from giving expert evidence. But those observations were simply made as a matter of principle and certainly

did not establish that it will always be appropriate for an employed person to give expert evidence for his employer. It is also significant that the case concerned a tenant's occupation of public housing owned by a local authority. They were not proceedings based on any decision in which the very employee who was proferred as expert had played a significant role.

110. Our attention was also drawn to a number of decisions of the Tribunal in cases where witnesses employed by Ofcom in similar positions to Ms. Curry had given expert evidence which the tribunal had found satisfactory. These included, for example, *British Telecommunications Plc v Ofcom (Ethernet Determinations)* [2014] CAT 14. At [72], the Tribunal held:

> "Ofcom called only one witness, Mr Geoffrey Myers, who is Director of Competition Economics at Ofcom and also a Visiting Professor in Regulation at the London School of Economics. Mr Myers was responsible for overseeing the economic analysis in the Determination, and to that extent his evidence was in part as a witness of fact. He was also involved in the leased lines market review, which led to the 2004 LLMR, but not in the market reviews that led to the 2008 BCMR and 2009 LLCC. In addition, however, Mr Myers gave evidence also as an expert economist. It was put to him that he was appearing as the "champion of Ofcom" to defend the Determination but Mr Myers denied this and said that he was very conscious of his duty to the Tribunal. We accept that answer and do not find that the fact that he was employed by Ofcom impeded his objectivity."

111. Ultimately these cases prove no more than that the Tribunal in question was satisfied as to the particular individual's ability to give objective expert testimony in the circumstances of the case. For the reasons we have identified, however, at times we found it difficult to distinguish the nature of Ms. Curry's evidence in this case. We therefore do not think that cases such as *Field v Leeds CC* and *Ethernet Determinations* should be taken as precedents which in any way lessen the obvious difficulties faced by any person responsible for a regulatory decision being asked to give both factual evidence and expert evidence in relation to that very decision.

E. OUTLINE OF THE PARTIES' CONTENTIONS

(1) General

112. The focus of the dispute for the Tribunal to decide concerns market definition. Subject to its challenge on Ofcom's definition of the relevant markets, BT made no separate challenge to Ofcom's SMP findings in respect of those markets. Similarly, Ofcom accepted that if it erred in defining the relevant markets in the manner alleged by BT, its SMP findings could not stand and must be remitted for reconsideration.

(2) Product market definition – outline

113. The purpose of defining a relevant product market is to identify the products or services which are sufficiently close substitutes so as to exercise a competitive constraint on the price of the product or service under consideration.

114. Ofcom determined that a single market existed for all CISBO products from 10M to 100G, finding that those products were all linked by a so-called 'chain of substitution'. In particular, in contrast to its finding in the BCMR 2013, it found that there was no longer a 'break' in the chain of substitution between 1G and 10G.

115. At least for the purposes of this appeal, BT did not dispute that a chain of substitution existed for bandwidths up to and including 1G; or that a chain of substitution existed for bandwidths above 10G. BT indicated that it took this stance because whilst it did not agree that bandwidths up to and including 1G formed a single market, it did not consider it worthwhile appealing such a finding, since the outcome of an SMP assessment at those lower bandwidths would be the same whether or not they were considered a single market.

116. In general terms the parties were agreed that the appropriate conceptual framework to apply to assess the level of competitive constraint is the

hypothetical monopolist test (**"HMT**"). This asks whether or not a Small Significant Non-Transitory Increase in Price (**"SSNIP**") imposed by a hypothetical monopolist of a given product would be profitable or unprofitable by reason of the switching of customers to alternative products. The HMT test was summarised in FS 4.111, in a manner which BT accepted as correct, as follows:

> "[The HMT framework] starts with a focal product - in this case, a particular CISBO service (or set of services) - and it is assumed there is a single supplier of this focal product (i.e. the hypothetical monopolist). The test considers how end-users and suppliers of other CISBO services would react to a SSNIP applied to this focal product. If demand and/or supply-side switching to/from another CISBO service(s) were likely to occur on a scale sufficient to render the price increase unprofitable, the focal product is widened to include this service(s). Another SSNIP is then applied to the wider product set. The test is repeated in this way until a price increase by a hypothetical monopolist would be profitable, and at this stage the relevant market is defined."

117. Although the HMT can involve consideration of demand-side and supply-side substitution, and although supply-side substitution was covered copiously in the written evidence, it was common ground on the hearing of the appeal that the determinative issue in this case was demand-side substitution.

118. Consistent with the explanation of the HMT in the FS, it was also common ground that in order for Ofcom to sustain a finding of a single market across all CISBO bandwidths, Ofcom needed to show that a SSNIP at both 1G and 10G would be unprofitable. The characteristics of this market are quite unusual: products are only offered at wholesale in defined bandwidths spaced significantly apart (e.g. 100M, 1G, 10G etc) and the demand for bandwidth is consistently expected to increase due to the march of technology. In such a market, it might well be thought that customers switching to a lower bandwidth product in response to a SSNIP on a higher bandwidth product is inherently unlikely. However, there was no suggestion that the HMT or SSNIP analysis was not suited to the task at hand.

119. In arriving at its decision that there was a single chain of substitution across all CISBO bandwidths, Ofcom conducted what it described in the Final Statement as a 'qualitative' version of the HMT with respect to both 1G and 10G

services. As summarised in Ofcom's closing submissions, this entailed Ofcom analysing evidence from a variety of sources and forming the view: (i) that 1G and 10G products were functionally substitutable in that customers needing more than 1G of bandwidth could satisfy that need by opting either for multiple 1G links or a single 10G link; (ii) that the price of leasing two or more 1G circuits was close to (or more than) the price of a single 10G circuit; and (iii) that there were likely to be sufficient customers whose demand for bandwidth might be met either by multiple 1G circuits or a single 10G circuit so that the likely level of switching in response to a SSNIP at either 1G or 10G would be sufficient to constrain a hypothetical monopolist of either service.

120. The essence of BT's complaint was that although Ofcom might have identified some degree of substitutability and competitive interactions between 1G and 10G services, when carrying out its HMT, Ofcom had failed to focus adequately on the essential question of whether the scale of switching in response to a SSNIP would be sufficient to render the SSNIP unprofitable for the hypothetical monopolist. BT argued that a SSNIP at both 1G and 10G would be profitable for the hypothetical monopolist at each bandwidth and hence that there is a 'break' in the chain of substitution between the 1G and 10G bandwidths and that the 1G and 10G services do not provide a sufficient competitive constraint upon each other to form part of the same product market.

121. In addition, BT argued that Ofcom not only had to demonstrate that both the 1G and 10G SSNIPs would be unprofitable, but also that it had to demonstrate price interdependence at the extremes of the chain of substitution to show that the entire chain forms a single market. Ofcom's response was that as long as each link in a chain of substitution is robust, pricing interdependence can be assumed throughout the chain and that there is therefore a single market.

122. We address these arguments under issues 1-3 in the list of issues. Issues 4 and 5 concerned supply-side substitution, as noted above, by the time of the hearing it was agreed between the parties that these issues were not critical. They are therefore not dealt with in this judgment.

(3) Geographic market definition – outline

123. The parties agreed that for the purpose of geographic market definition, it is appropriate to aggregate areas where competitive conditions are sufficiently homogeneous and which can be distinguished from neighbouring areas in which competitive conditions are appreciably different.

124. As explained above, Ofcom defined three geographic markets for CISBO services in the UK (excluding Hull): the CLA, the LP and the RoUK.[12]

125. In arriving at those three geographic markets, Ofcom used two tests as proxies to assess the differences in competitive conditions across the UK.[13] In short, the tests were used as follows:

(1) The **High Network Reach Test** (the "**HNR Test**" or "**Network Reach Test**") was used as a way of identifying areas where competitive conditions appeared to differ from the RoUK to an extent that merited further analysis. The HNR Test was a measure of the average number of OCPs with infrastructure within a given distance of businesses within a postcode sector. Ofcom considered that areas where the average business had two or more OCPs' networks within 200m had greater potential for competition than other areas in the RoUK.

(2) The **Boundary Test** was used as a proxy for identifying areas where rival infrastructure was sufficiently dense and extensive for Ofcom to conclude that competition was likely to be effective across the CISBO market. Broadly speaking, Ofcom defined the Boundary Test by reference to the boundary of the CLA, which it considered was an area of particularly dense concentration of rival infrastructure and businesses with the greatest potential for competition for CISBO services of all bandwidths to be fully effective. This led to a Boundary Test requirement that:

[12] A summary of Ofcom's decision on geographic market definition is set out at FS 4.312 to 4.318.
[13] FS 4.372.

(i) businesses should have on average five or more OCPs within 100m; or

(ii) businesses should have on average four or more OCPs within 100m and 90% of businesses should be within 100m of at least two OCPs.

126. Using the Network Reach Test, Ofcom identified the CLA, the LP, and the Central Business Districts of Manchester, Bristol, Birmingham, Glasgow and Leeds (the "**CBDs**") as candidate areas whose competitive conditions potentially differed materially from those in the RoUK.

127. However, Ofcom ultimately settled on three geographic markets in its final decision because although it thought that the CLA and the LP were areas in which competitive conditions were homogeneous and distinct from the other areas, it decided to group the CBDs together with the RoUK as a single geographic market. This implied that the competitive conditions in the CBDs were sufficiently homogeneous with those in the RoUK to enable them to be treated as one market.

128. In Ground D2 of BT's Notice of Appeal BT contended that Ofcom erred in its geographic market definition, in particular in its specification and application of the Network Reach Test and/or Boundary Test. Para 144 of BT's Notice of Appeal sets out that complaint in more detail:

> "144. However, BT maintains that Ofcom's specification and/or application of the Boundary Test and/or HNR fails to achieve the objectives set out in the SMP Guidelines and BEREC Common Position. In short, Ofcom's approach (i) does not allow the market definition to identify heterogeneity in competitive conditions and (ii) does not ensure that differences in competitive conditions are smaller within defined geographic markets than between defined geographic markets. Specifically, Ofcom has erred by:
>
> (i) treating the satisfaction of the Boundary Test as a necessary – not merely sufficient – condition for a finding of effective competition on a relevant geographic market (notwithstanding claims to the contrary);
>
> (ii) setting overly stringent conditions as to the number of alternative CPs (other than BT) required to satisfy the Boundary Test and/or failing to

have proper regard to other indicators of competition such as service shares;

(iii) setting overly stringent conditions as to the proportion of customer sites that must be, on average, located within a given proximity to those providers' networks;

(iv) underestimating the buffer distance for all CISBO services as measured from fibre flexibility point, which error is exacerbated by setting a single 100m "buffer distance" for CISBO services at all bandwidths, without due regard for the fact that dig distances are substantially higher for VHB than for the Lower Bandwidths;

(v) using an inadequate metric for the geographic location of CISBO demand (i.e. large business sites …);

(vi) defining the LP boundary based on the old WECLA Boundary minus the CLA, notwithstanding that a different boundary is justified based on (i) the High Network Reach analysis described above and (ii) Ofcom's new dataset of "large business sites", which differs from that used in 2013 to define the WECLA;

(vii) excluding CPs that provide microwave and EFM from its assessment; and

(viii) applying the HNR/Boundary Test at postcode sector level rather than postcode level."

129. This paragraph then formed the basis for Issue 6 and sub-issues in the Agreed List of Issues. In Issue 7, BT also contended that Ofcom should have carried out a cumulative sensitivity analysis to assess the robustness of the Boundary Test.

The CBDs jurisdiction point

130. Within the context of geographic market definition, detailed submissions were also made to the Tribunal regarding Ofcom's decision to not define a separate geographic market for the CBDs.

131. This point had been expressly raised in CF's Notice of Appeal, where CF suggested that Ofcom's Boundary test was:

> "too severe, crude and all-inclusive. It should have been executed more thoroughly by examining, at least, the central business districts […]. In short

> as the Commission's commentary on the BCMR agreed, the analysis should have been more "*granular*"".

The reference to the Commission's commentary on the BCMR was to a letter from the European Commission following its review of Ofcom's draft proposals, to which we shall refer in more detail below.

132. The treatment of the CBDs also formed the focus of submissions made by two of the interveners, Gamma and Virgin Media.

133. Gamma intervened in support of both appeals. In relation to BT, it supported BT's argument that Ofcom's design and use of the Boundary Test was overly-simplistic and an excessively stringent view of what constituted an effectively competitive market. Gamma also contended that the use of an erroneous Boundary Test had led Ofcom wrongly to conclude that none of the CBDs could be truly competitive simply because they were not as competitive as the CLA.

134. Virgin intervened in BT's appeal. It put forward substantial arguments to the same effect as BT as to why the Boundary Test was too stringent and had not been applied correctly. Virgin also expressly contended that Ofcom's conclusion that the CBDs should be regarded as part of the same geographical market as the RoUK was wrong. At paragraphs 113-115 of Virgin's Statement of Intervention, Virgin alleged that:

> "[Ofcom's] determination is at odds with VM's experience of market realities […]. It is also a manifestly flawed analysis […] pronounced differences […] exist on the face of Ofcom's own data, between the CBDs and the RoUK in terms both of the level of infrastructure competition and BT's market shares.
>
> As regards infrastructure competition, the CBDs exhibit a materially different set of characteristics from those elsewhere in the RoUK by reference to key metrics that Ofcom deployed […]. By reference to each metric, infrastructure competition was: greater in the CBDs than in other areas of the RoUK; greater in the CBDs than in the LP; and more closely proximate to the conditions found by Ofcom in the CLA. These points would have become clearer still had Ofcom applied (as it did in 2013) a "buffer" of 200m instead of unjustifiably raising the bar by imposing a buffer of 100m […].
>
> In any event, on either "buffer" distance, and both for lower bandwidths and VHB services, it is evident from Ofcom's own analysis that levels of infrastructure competition differ appreciably between the CBDs on the one hand and the other areas of the RoUK on the other. That conclusion is

> reinforced by the disparities which exist between EFM provision within CBDs on the one hand and in other areas of the RoUK on the other. Ofcom failed to have regard to those disparities because it erroneously excluded EFM from its network reach analysis."

135. In its Defence at paragraphs 243-248, Ofcom specifically outlined its treatment of the CBDs. In particular, at paragraph 243, Ofcom indicated that its decision had been influenced by a consideration as to whether the same SMP result would be obtained were the markets to be analysed separately and whether different remedies would be imposed if SMP was established in each area. Ofcom stated:

> "In relation to the CBDs, Ofcom was concerned to establish whether the competitive conditions in those areas were sufficiently distinct from the surrounding area (the RoUK) as to make it appropriate to define them as separate geographic markets. As Ms Curry explains, that would have been appropriate if the analysis had suggested that the CBDs might have a distinct SMP analysis or distinct remedies. Ofcom concluded, however, that (unlike the LP) the competitive conditions in the CBDs were such that they would be likely to have the same SMP finding and remedies as the RoUK. Accordingly, it was appropriate to include the CBDs within the same geographic market as the RoUK."

In addition, in paragraphs 336-340 of its Defence, Ofcom specifically pleaded in response to Gamma's and Virgin's points from their Statements of Intervention.

136. The issues raised in relation to the CBDs were addressed in the evidence filed for the appeals; the relevant paragraphs of Gamma's and Virgin's Statements of Intervention were referred to as cross-references to Issue 6 raised by BT's appeal; and the Skeleton Arguments prepared for the hearing addressed the points. Moreover, even though the CF appeal was amended to remove its market definition challenges, the CBD point was addressed in the oral openings of BT and Ofcom and in the cross-examination of a number of the witnesses.[14]

137. Notwithstanding all of this, in its written closing submissions, Ofcom raised, for the first time, the argument that the Tribunal had no jurisdiction to address the question whether the CBDs should be a separate geographical market from

[14] See *e.g.* T2/216-219 and T4/483-491.

the RoUK. Ofcom submitted that this point was not included within BT's Notice of Appeal, that it was unpleaded, and accordingly that it was outside the scope of this appeal as defined by section 195(2) of the 2003 Act.

138. In support of this point, Mr. Holmes referred to the Court of Appeal's judgment in *BT & ors v Ofcom (Ethernet Determinations)* [2017] EWCA Civ 330. At [55] – [57] of that decision, the Court of Appeal dismissed part of an appeal by BT, stating,

> "55. There are two aspects to this ground of appeal. BT complains (1) that Ofcom was wrong in its Determination to disallow BT's use of a cost orientation methodology involving an aggregation of certain elements of its costs to a greater degree than the DSAC solution required by Ofcom, and (2) that Ofcom was wrong to require cost orientation by reference to annual periods, as compared with three year periods which BT would prefer.
>
> 56. Point (2) can be shortly disposed of. Section 195(2) of the 2003 Act provides that where the CAT disposes of an appeal from Ofcom, "The Tribunal shall decide the appeal on the merits and by reference to the grounds of appeal set out in the notice of appeal". BT failed to include point (2) in its notice of appeal to the CAT. Mr Thompson showed us a passage in BT's reply which appeared to refer to the point, but no application was made to the CAT for permission to amend BT's notice of appeal. Unsurprisingly, the CAT did not address this point in its judgment. It had no power to do so. Surprisingly, this is made a point of criticism of the CAT by BT. In our view, the criticism is misconceived.
>
> 57. The rule in section 195(2) is there for good reason. As even our limited review of the case over the four day hearing of this appeal has underlined, in complex competition cases like this the CAT can be confronted with a great deal of elaborate expert economic evidence and very extended, intricate legal submissions, not always clearly focused on the issues falling for determination by the CAT. It is important that the CAT can have confidence in the pleaded issues in the grounds of appeal set out in the notice of appeal as the relevant definition of the matters it has to decide, so as to maintain proper focus in its deliberations and in framing its judgment. The CAT has rightly in this case worked through the grounds in BT's notice of appeal and not strayed beyond them."

139. Mr. Holmes submitted that these jurisdictional limitations, coupled with the fact that CF's market definition challenge had been removed by amendment, meant that Virgin and Gamma were not entitled to pursue the arguments in relation to the CBDs because they were not included within BT's Notice of Appeal. He also submitted that the fact that Ofcom had not taken the point at any earlier stage was irrelevant: he suggested that a jurisdictional point could

be taken at any stage and that Ofcom could not be taken to have waived its right to object to a lack of jurisdiction.

140. We of course accept the jurisdictional limitations imposed by section 195(2) of the 2003 Act, but ultimately they boil down to a question of interpretation of the Notice of Appeal in any individual case. In approaching that exercise, we also note the point made by the Court of Appeal at [57] in the *Ethernet Determinations* case, that the purpose of section 195(2) is essentially to assist the Tribunal (and no doubt the parties) in identifying and focussing the issues to be decided.

141. In that regard, in this case the broad question of whether Ofcom's design and application of the Boundary Test and/or the Network Reach Test has produced a result in which the competitive conditions in each of the geographical markets which Ofcom defined were sufficiently similar, and the difference between those conditions and those in the other geographical markets was sufficiently large, has always been identified in the pleadings. BT contended that Ofcom had erred in this respect: see the first two sentences of paragraph 144 of BT's Notice of Appeal (paragraph 128 above). We think that the decision to aggregate the CBDs and the RoUK - with the implication that competitive conditions in those areas were sufficiently similar - has always been implicitly included within that issue.

142. Moreover, although it is true that the treatment of the CBDs was not specifically identified in the sub-headings of para 144 of BT's Notice of Appeal, until the point was taken by Ofcom in closing, the parties proceeded on the basis that Ofcom's treatment of the CBDs as part of the RoUK was properly before the Tribunal and live for decision in the case. In particular, Ofcom specifically pleaded a case in relation to the treatment of the CBDs and responded in terms to Virgin Media's Statement of Intervention in that regard. We therefore reject Mr Holmes' submission that the point was "unpleaded". We also assume that Ofcom must have taken the view that the treatment of the CBDs was within the scope of BT's appeal, and that the intervention by Virgin Media was likewise appropriate and within the scope of BT's appeal, because,

as we have pointed out, Virgin Media only intervened in BT's appeal. The amendment of CF's appeal was therefore irrelevant.

143. In these circumstances, and having regard to the purpose for which section 195(2) is included in the 2003 Act, we consider that we can and should regard the CBDs issue as falling within the scope of BT's Notice of Appeal in the same way as the parties appear to have done, and we reject Ofcom's submission that we should not consider it.

144. Further or alternatively, and in order to put the matter beyond doubt, the Tribunal would be minded, if a formal application was made by BT, to grant late permission to amend BT's Notice of Appeal pursuant to Rule 12 of The Competition Appeal Tribunal Rules 2015 (S.I. No. 1648 of 2015) to raise the CBDs point explicitly. Although the grant of permission to amend at such a late stage is obviously wholly exceptional, given that the CBDs point was pleaded, fully explored and properly ventilated in written and oral submissions before the Tribunal, we do not consider that such amendment involves any substantial change or addition to BT's case as argued before us, and hence, although the point could have been more explicitly stated by BT, the amendment would cause no material prejudice to Ofcom. Moreover, we consider that such course gives full effect to the purpose behind section 195(2) of the 2003 Act and to the Governing Principle in Rule 4, by enabling the Tribunal to deal with all matters properly in issue between the parties justly and without the waste of costs that would be caused if, having been ventilated in the proceedings, the point was not now decided.

145. Indeed, not only do we consider that no material prejudice will be caused to Ofcom in granting such permission, we consider that there is considerable benefit to Ofcom in so doing. That is because we will be quashing Ofcom's determination of the product market in any event and remitting that matter to Ofcom for reconsideration. Ofcom's position in that event was stated in paragraph 211 of its Defence:

> "In the event that the Tribunal considers that Ofcom erred in its identification of the appropriate product market then it would be appropriate to remit to

> Ofcom the questions of Product Market Definition, Geographic Market Definition, Significant Market Power and remedies."

146. Accordingly, Ofcom itself takes the view that in the situation that has arisen concerning the product market definition, the Tribunal should also remit the geographical market definition question for reconsideration. That being so, we think that it is manifestly desirable that on such reconsideration Ofcom should know the view that the Tribunal has reached on the treatment of the CBDs so that it can take that decision into account and avoid the repetition of any errors that we identify. Otherwise, were Ofcom simply to proceed to apply the same approach to the CBDs as before, the risk is that its new decision would simply be appealed again on the same CBDs point (albeit under the new judicial review standard introduced by section 87 of the Digital Economy Act 2017).

(4) The competitive core – outline

147. Issue 8 concerns Ofcom's assessment of BT's core network. The core is a central network of wholesale leased lines which falls outside the three geographic markets identified by Ofcom. BT has never been found to hold SMP in the core because certain key rivals with competing networks present at BT's core exchanges provide rivalry which ensures that BT's core/backhaul is subject to effective competition.

148. In the FS, Ofcom re-assessed the existing boundary between the competitive core and the terminating segments of BT's network. Ofcom reached the preliminary view that 96 more of BT's exchanges were now competitive, such that the scope of the core should be expanded to include them. These 96 new exchanges were identified using a threshold to identify the presence of key rivals at BT's exchanges. In the consultation that followed, BT identified a factor which Ofcom had overlooked (the 'indirect presence' of key rivals at its exchanges). BT argued that this indicated that more exchanges met Ofcom's threshold for inclusion in the core. Ofcom agreed that indirect presence was relevant to the assessment of competitive conditions: and that taken on its own this factor might imply that more than the 96 new exchanges should be considered competitive. However, Ofcom went on to revise the threshold for

identifying competitive exchanges and ultimately decided that only 34 new exchanges should fall within the core.

149. BT argued that it was plain that something went wrong in Ofcom's evaluation of the core; in particular, its revision of the threshold for the identification of competitive exchanges was irrational. In response, Ofcom argued that there were other factors arising out of the consultation process which pointed in the opposite direction from BT's factor, that taking these into account had led to the reduction in the number of potential new competitive exchanges, and that there was no error in its decision-making process.

F. PRODUCT MARKET DEFINITION

(1) Introduction

150. The concept of market definition and the purpose and functioning of the HMT (hypothetical monopolist test) is explained in the Notice on Market Definition in the following terms (footnotes omitted):

> "2. Market definition is a tool to identify and define the boundaries of competition between firms. It serves to establish the framework within which competition policy is applied by the Commission. The main purpose of market definition is to identify in a systematic way the competitive constraints that the undertakings involved face. The objective of defining a market in both its product and geographic dimension is to identify those actual competitors of the undertakings involved that are capable of constraining those undertakings' behaviour and of preventing them from behaving independently of effective competitive pressure. It is from this perspective that the market definition makes it possible inter alia to calculate market shares that would convey meaningful information regarding market power for the purposes of assessing dominance […].
>
> […]
>
> 13. Firms are subject to three main sources of competitive constraints: demand substitutability, supply substitutability and potential competition. From an economic point of view, for the definition of the relevant market, demand substitution constitutes the most immediate and effective disciplinary force on the suppliers of a given product, in particular in relation to their pricing decisions. A firm or a group of firms cannot have a significant impact on the prevailing conditions of sale, such as prices, if its customers are in a position to switch easily to available substitute products or to suppliers located elsewhere. Basically, the exercise of market definition consists in identifying the effective alternative sources of supply for the customers of the undertakings involved, in terms both of products/ services and of geographic location of suppliers.
>
> […]
>
> Demand substitution
>
> 15. The assessment of demand substitution entails a determination of the range of products which are viewed as substitutes by the consumer. One way of making this determination can be viewed as a speculative experiment, postulating a hypothetical small, lasting change in relative prices and evaluating the likely reactions of customers to that increase. The exercise of market definition focuses on prices for operational and practical purposes, and more precisely on demand substitution arising from small, permanent changes in relative prices. This concept can provide clear indications as to the evidence that is relevant in defining markets.

> 16. Conceptually, this approach means that, starting from the type of products that the undertakings involved sell and the area in which they sell them, additional products and areas will be included in, or excluded from, the market definition depending on whether competition from these other products and areas affect or restrain sufficiently the pricing of the parties' products in the short term.
>
> 17. The question to be answered is whether the parties' customers would switch to readily available substitutes or to suppliers located elsewhere in response to a hypothetical small (in the range 5% to 10%) but permanent relative price increase in the products and areas being considered. If substitution were enough to make the price increase unprofitable because of the resulting loss of sales, additional substitutes and areas are included in the relevant market. This would be done until the set of products and geographical areas is such that small, permanent increases in relative prices would be profitable. […] In the application of these principles, careful account should be taken of certain particular situations as described within paragraphs 56 and 58."

151. The SMP Guidelines discuss the application of the HMT in the telecoms sector:

> "40. One possible way of assessing the existence of any demand and supply-side substitution is to apply the so-called 'hypothetical monopolist test' [(26)]. Under this test, an NRA should ask what would happen if there were a small but significant, lasting increase in the price of a given product or service, assuming that the prices of all other products or services remain constant (hereafter, 'relative price increase'). While the significance of a price increase will depend on each individual case, in practice, NRAs should normally consider customers' (consumers or undertakings) reactions to a permanent price increase of between 5 to 10%. The responses by consumers or undertakings concerned will aid in determining whether substitutable products do exist and, if so, where the boundaries of the relevant product market should be delineated.
>
> 41. As a starting point, an NRA should apply this test firstly to an electronic communications service or product offered in a given geographical area, the characteristics of which may be such as to justify the imposition of regulatory obligations, and having done so, add additional products or areas depending on whether competition from those products or areas constrains the price of the main product or service in question. Since a relative price increase of a set of products is likely to lead to some sales being lost, the key issue is to determine whether the loss of sales would be sufficient to offset the increased profits which would otherwise be made from sales made following the price increase. Assessing the demand-side and supply-side substitution provides a way of measuring the quantity of the sales likely to be lost and consequently of determining the scope of the relevant market."
>
> (Footnotes 27 to 29 omitted)

152. Footnote 26 to the SMP Guidelines states:

> "([26]) […] Although the SSNIP test is but one example of methods used for defining the relevant market and notwithstanding its formal econometric nature, or its margins for errors […], its importance lies primarily in its use as a conceptual tool for assessing evidence of competition between different products or services."

153. The OFT Guidance is to similar effect, stating at paragraphs 2.5 to 2.7,

> "2.5 The process of defining a market typically begins by establishing the closest substitutes to the product (or group of products) that is the focus of the investigation. These substitute products are the most immediate competitive constraints on the behaviour of the undertaking supplying the product in question. In order to establish which products are "close enough" substitutes to be in the relevant market, a conceptual framework known as the hypothetical monopolist test (the test) is usually employed.
>
> 2.6 Before describing the test in detail, it should be emphasised that defining a market in strict accordance with the test's assumptions is rarely possible. Even if the test described below could be conducted precisely, the relevant market is in practice no more than an appropriate frame of reference for analysis of the competitive effects. Nevertheless, the conceptual framework of the test is important as it provides a structure within which evidence on market definition can be gathered and analysed.
>
> 2.7 In essence the test seeks to establish the smallest product group (and geographical area) such that a hypothetical monopolist controlling that product group (in that area) could profitably sustain "supra competitive" prices, i.e. prices that are at least a small but significant amount above competitive levels. That product group (and area) is usually the relevant market."

154. Although (as indicated in paragraph 116 above), the Final Statement appeared to accept that the HMT was the appropriate conceptual framework to test whether there was a break in the chain of substitution at the 1G and 10G bandwidths, there were also times at which Ofcom seemed to suggest that, depending on the facts, it might not be necessary to perform any detailed SSNIP analysis. For example, Mr Holmes stated in opening:

> "In my submission, there may be good evidence that products are already exerting a competitive constraint on one another, and in that situation, there may be less need to engage in [an] elaborate hypothetical inquiry. If there are competitors' documents which show that they are taking account of a competitive constraint in setting a price, that may alleviate the need for any more extensive analysis."[15]

155. Similarly, in cross-examination Ms Curry stated:

[15] T3/369.

> "[…] I think it might be helpful to discuss with the Tribunal the focus that the SSNIP test usually has within the context of market definition. In my experience of defining relevant product markets it is very rare that you would get even more than a cursory mention of the SSNIP test. The SSNIP test is the conceptual framework that helps you to draw a line in your own mind about what is sufficiently substitutable that two products might be considered within the same market. Ultimately the exercise of market definition is interested in identifying relevant competitive constraints and a key part of that assessment is determining the degree of substitutability from the perspective of end users. Because of that, most market definition exercisers will spend most of their time discussing substitutability and considering various pieces of evidence that go to the perception that end users have of their willingness to switch to a potential alternative and the price sensitivity of that response. It would be really unusual in most market definition exercises to spend that much time talking about the SSNIP framework itself or using these terms "profitable"/"unprofitable"."[16]

156. We accept that in certain situations it may be possible for an authority to avoid conducting a full relevant market analysis. For example, a decision may not hinge on the precise boundaries of the market in question: the finding on dominance or SMP (or, in the case of merger, significant lessening of competition) may obviously be the same whether market definition 'X' or 'Y' is adopted. In other cases, the outer limit of the market may be so obvious that it is beyond dispute that product 'Z' falls outside its scope and therefore no further investigation is necessary.

157. However, this appeal is plainly not such a case: the proper definition of the relevant product market or markets is obviously highly contentious. Accordingly, to the extent that Ofcom or Ms. Curry were trying to suggest that Ofcom could appropriately attempt to assess the sufficiency of the competitive constraints exerted by the 1G and 10G products upon each other without full reference to the SSNIP framework, we reject that submission. As the authors of Bishop & Walker, *The Economics of EC Competition Law* (2010) ("**Bishop & Walker**") point out at page 123, there is an inherent danger in trying to assess a competitive constraint outside the SSNIP framework:

> "It cannot be stressed enough that defining relevant markets on a basis that is not consistent with the principles of the Hypothetical Monopolist Test will, almost by definition, fail to take properly into account demand-side and supply-side substitution possibilities. In consequence, any market shares calculated from such market definitions will not provide, except purely by chance, a good proxy of market power. Although the Hypothetical

[16] T12/1059-1060.

> Monopolist Test is often proposed as one possible way of defining relevant markets, no alternative that is consistent with the principles of assessing demand-side and supply-side substitutability has been proposed.
>
> […] the Hypothetical Monopolist Test provides a coherent framework in which to consider the relevant issues relating to the competitive constraints faced by firms under investigation and consequently assists in moving the analytical debate beyond ad hoc introspection and focuses it explicitly on the key concepts of demand-side and supply-side substitution. Although the Hypothetical Monopolist Test is often seen as necessarily involving quantitative analysis, this misrepresents its true value which lies more in its role as providing a conceptual framework within which to conduct the analytical assessment. The Commission itself implicitly notes this possibility when it states in the Notice that the Hypothetical Monopolist Test can "be viewed as a speculative experiment". This is clearly not the same as requiring a formal economic test to be undertaken when the data is available."
>
> (Footnotes omitted.)

158. Assuming that the SSNIP test is the appropriate method for determining the relevant market, the Notice on Market Definition goes on at paragraphs 36-43 to describe the types of evidence which might be relevant to a SSNIP assessment. In summary they are: (i) evidence of substitution in the recent past; (ii) quantitative tests; (iii) views of customers and competitors; (iv) consumer preferences; (v) evidence concerning barriers and costs associated with switching demand to potential substitutes; and (vi) evidence concerning different categories of customers and price discrimination.

159. The SMP Guidelines comment on the types of evidence to be used in a SSNIP analysis in the telecoms sector:

> "Introduction
>
> […]
>
> 35. Market definition is not a mechanical or abstract process but requires an analysis of any available evidence of past market behaviour and an overall understanding of the mechanics of a given sector. In particular, a dynamic rather than a static approach is required when carrying out a prospective, or forward-looking, market analysis. […]
>
> […]
>
> Demand-side substitution
>
> 49. […] In determining the existence of demand substitutability, NRAs should make use of any previous evidence of consumers' behaviour. Where available, an NRA should examine historical price fluctuations in potentially

competing products, any records of price movements, and relevant tariff information. In such circumstances evidence showing that consumers have in the past promptly shifted to other products or services, in response to past price changes, should be given appropriate consideration. In the absence of such records, and where necessary, NRAs will have to seek and assess the likely response of consumers and suppliers to a relative price increase of the service in question. […]"

160. The OFT Guidance also contains a helpful discussion of the types of evidence which may assist in a SSNIP assessment:

"3.7 Evidence on substitution from a number of different sources may be considered. Although the information used will vary from case to case and will be considered in the round the following evidence and issues are often likely to be important:

- Evidence from the undertakings active in the market and their commercial strategies may be useful. For example, company documents may indicate which products the undertakings under investigation believe to be the closest substitute to their own products. Company documents such as internal communications, public statements, studies on consumer preferences or business plans may provide other useful evidence.

- Customers and competitors will often be interviewed. In particular, customers can sometimes be asked directly how they would react to a hypothetical price rise, although because of the hypothetical nature of the question, answers may need to be treated with a degree of caution. Survey evidence might also provide information on customer preferences that would help to assess substitutability […].

- A significant factor in determining whether substitution takes place is whether customers would incur costs in substituting products. High switching costs relative to the value of the product will make substitution less likely.

- Evidence on product characteristics may provide useful information where customer substitution patterns are likely to be influenced significantly by those characteristics. […]

- Patterns in price changes can be informative. For example, two products showing the same pattern of price changes, for reasons not connected to costs or general price inflation, would be consistent with (although not proof of) these two products being close substitutes. Customer reactions to price changes in the past may also be relevant. Evidence that a relatively large proportion of customers had switched to a rival product in response to a relatively small price rise in the focal product would provide evidence that these two goods are close substitutes. Equally price divergence over time, without significant levels of substitution, would be consistent with the two products being in separate markets.

- Evidence on own or cross price elasticities of demand may also be examined if it is available. The own price elasticity of demand measures the rate at which demand for a product (e.g. the focal product) changes when its price goes up or down. The cross price elasticity of demand measures the rate at which demand for a product (e.g. a rival product)

changes when the price of another product (e.g. the focal product) goes up or down.

- In some cases critical loss analysis may be relevant. One definition of critical loss is the minimum percentage loss in volume of sales required to make a 5 (or 10) per cent price increase on a product unprofitable. The critical percentage tends to be lower when an undertaking has a high mark up over unit costs (since each sale lost entails a relatively large loss in profit). However, the fact that an undertaking can set a high mark up might also demonstrate that its current customer base is not particularly price sensitive. These potentially opposing effects might need to be balanced and assessed in conjunction with other evidence (e.g. estimates of elasticities of demand); and

- Evidence on the price:concentration relationship may also be informative. Price:concentration studies examine how the price of a product in a distinct area varies according to the number (or share of supply) of other products sold in the same area. […]."

161. What emerges from these passages is that there is a very broad spectrum of potentially relevant evidence to be taken into account when a SSNIP analysis is conducted. Some of these types of evidence have a more 'qualitative' character (e.g. internal documents); others may have a more 'quantitative' character (e.g. evidence of price correlation). The availability and robustness of these different types of evidence, and hence their relative importance, will vary from case to case.

162. However, although a very wide range of evidence may be relevant, the critical question in conducting the HMT remains the same: whether or not a SSNIP in relation to the focal product would be unprofitable. This point was accepted by Ms. Curry in cross-examination:

A (Ms Curry) […] The SSNIP is this hypothetical thought experiment about how much switching you would be likely to see in response to a small price increase. It is a helpful way of thinking about how much substitution you would need to see for an alternative product in practice to be likely to affect the price of the product that you are interested in.

Q (Mr Beard) And the key question here, the key point of the SSNIP test, is would that switching you have referred to be enough to make the SSNIP price rise unprofitable? That is correct, is it not?

A (Ms Curry) Of the hypothetical thought experiment, yes, but all of this is going to the ultimate question of whether there is sufficient substitutability for the price of one product to constrain another in practice such that the constraint from that product

should be taken into account in any assessment of competitive effects.

Q (Mr Beard) But just to be clear, the important question underlying the SSNIP test is the impact that a price increase would have on profitability, i.e. would it be profitable for a hypothetical monopolist of the focal product to impose a 5% increase in prices? That is right, is it not?

A (Ms Curry) That is right for the SSNIP test, yes.

Q (Mr Beard) In order to work out whether a focal product is worth monopolising, you need to determine whether demand and/or supply-side substitution is sufficient to render the SSNIP unprofitable. That is correct, is it not?

A (Ms Curry) Yes."[17]

163. To decide whether a SSNIP would be unprofitable requires an assessment of what would happen if the hypothetical price rise were implemented. In particular, to answer the central question of whether the SSNIP would be unprofitable, the authority would need to consider: (i) how many purchasers would cease their purchases of the focal product in the face of the price rise (either by switching to substitutes or ceasing purchases altogether); and (ii) how much money the hypothetical monopolist would save by serving only the reduced pool of purchasers of the focal product (which will depend upon its gross margin).

164. As noted in the OFT Guidance, in some cases, a "critical loss analysis" might be conducted to assist in answering this question. The "critical loss" can be defined as the minimum percentage loss of sales due to the posited price increase which would be needed to offset the margin gain from the price rise. As a simple matter of arithmetic, a critical loss percentage can be readily calculated for any assumed gross margin.[18] The critical loss percentage for a given range of gross margins assuming a SSNIP of 10% is set out in Table 2 below:

[17] T12/1054-1055.

[18] Assuming constant marginal costs of production, critical loss equals **s / s + m**, where 's' is the assumed increase in price in percentage terms and 'm' is the margin for the product or service in percentage terms.

Table 2: Critical Loss Values for 10% SSNIP

Gross margin (%)	SSNIP of 10%
100	9.1%
90	10.0%
80	11.1%
70	12.5%
60	14.3%
50	16.7%
40	20.0%
30	25%
20	33.3%
10	50%

165. A "critical loss analysis" can be defined as a numerical analysis which seeks to estimate: (i) the actual critical loss percentage for a given product; and (ii) the likely loss of volumes which would flow from a SSNIP. Conducting a critical loss analysis is therefore one way of assessing whether a SSNIP would be unprofitable based on estimated numbers regarding gross margin and likely switching. The usefulness of any such numerical analysis will, however, obviously depend upon the availability and reliability of the underlying data and the soundness of any assumptions underpinning the analysis.

166. Accordingly, and bearing in mind the reference in the OFT Guidance to the possibility that "in some cases" a critical loss analysis "may be relevant", it is readily apparent, and was common ground between the parties (at least at the conclusion of the hearing), that there is no obligation or necessity in every case for an authority or a court to conduct a critical loss analysis in order to conduct the HMT and define a relevant market.

(2) Issue 1: Whether Ofcom erred in failing to undertake a quantitative SSNIP analysis in this case (having regard to the regulated prices for 1GB and VHB services)?

167. At FS 4.112, having set out its summary of the HMT in the passage to which we have already referred, Ofcom went on to state:

> "[…] for reasons set out in detail below, **we apply a qualitative version of this test**, looking at evidence on the likely degree of

> switching in response to a SSNIP on the services in question by both the demand and supply sides of the market."
>
> (Emphasis added)

168. As it turned out at the hearing, the scope of the dispute between the parties in this respect – as expressed in agreed Issue 1 - was never very clear. On one view this was probably the result of a failure by both sides to agree or define precisely what they meant by a "qualitative version" or a "quantitative" SSNIP analysis. On another view – which we endorse – it is because the very expressions "qualitative SSNIP analysis" and "quantitative SSNIP analysis" present a false dichotomy and are apt to confuse.

169. As we noted above, whilst an authority or court conducting the HMT must answer the question whether a SSNIP would be unprofitable for the hypothetical monopolist, the OFT Guidance and academic commentary make clear that there is no requirement that the authority or court conduct a critical loss analysis or a formal econometric test, and the guidance indicates that it should have regard to any available relevant evidence. As we have also pointed out, some of that evidence will have more of a qualitative character and other evidence will have more of a quantitative character. So, for example, in an appropriate case, the authority or court might legitimately rely purely on qualitative materials such as statements in internal documents of market participants: the question will be whether those qualitative materials provide sufficient evidence that a hypothetical monopolist would find a SSNIP unprofitable. For example, the qualitative evidence might indicate that a very low degree of switching could be expected to occur in response to a SSNIP, which would indicate that a SSNIP is likely to be profitable. However, this analysis is in essence no different to the analysis conducted when quantified data is available.

170. As such, we consider it inappropriate to label an HMT analysis "quantitative" or to refer to "a qualitative version" of the test. Such terminology wrongly suggests that a different type of SSNIP analysis is being conducted depending upon the type of evidence that is being relied upon. In the great majority of cases, there will be a mix of qualitative and quantitative evidence available:

but in all cases there is only one test and the question to be answered is the same – would a SSNIP be profitable or unprofitable?

171. We also reject any suggestion that there was in principle any particularly important type of "quantitative" evidence which Ofcom was duty-bound to consider, such that a failure to do so would necessarily amount to an error. Such an argument is essentially a variant of an argument run unsuccessfully by the appellant in *Aberdeen Journals v Director General of Fair Trading* [2003] CAT 11. The Tribunal's reasoning on this point is worth quoting in full:

> "126. One of the principal submissions made by Aberdeen Journals is that the Tribunal should accept a 'hierarchy' of evidence, in which objective economic evidence, such as consumer surveys, market studies or statistical analysis, should be accorded greater weight than what Aberdeen Journals describes as "subjective" evidence deriving, for example, from the statements or conduct of the parties. In particular, says Aberdeen Journals, evidence on the demand side from consumers or users is of crucial importance, and likely to be more significant than evidence from the supply side. The relative lack of evidence from consumers or users in this case is, says Aberdeen Journals, unprecedented in EC law […].
>
> 127. In our view, there is no set "hierarchy" of evidence in Community law on issues such as market definition. As the European Commission puts it at paragraph 25 of its Notice on Market Definition OJ (1997) C272/5:
>
> > "There is a range of evidence permitting an assessment of the extent to which substitution would take place. In individual cases, certain types of evidence will be determinant, depending very much on the characteristics and specificity of the industry and products or services that are being examined. The same type of evidence may be of no importance in other cases. In most cases, a decision will have to be based on the consideration of a number of criteria and different items of evidence. The Commission follows an open approach to empirical evidence, aimed at making an effective use of all available information which may be relevant in individual cases. The Commission does not follow a rigid hierarchy of different sources of information or types of evidence."
>
> 128. Similarly, although evidence of the attitudes of consumers or users will often be highly pertinent to an analysis of the relevant product market, there is in our view no rule of law which requires the Director to base his case on consumer surveys or market studies if he considers that his case is sufficiently proved by other evidence. What evidence the Director chooses to rely on to establish a relevant product market is a matter for him. Whether that evidence is sufficient to prove the case, is ultimately a matter for the Tribunal. In deciding whether the evidence is sufficient, the Tribunal will pay attention to evidence about the attitudes of consumers or users, or the absence thereof, but that is only one element of the Tribunal's assessment of the evidence as a whole. In this case we propose to look at the evidence "in the round" in reaching our conclusion."

172. In principle, therefore, qualitative evidence alone can be sufficient to conduct a SSNIP analysis and Ofcom cannot be said to have erred *in principle* in not conducting a "quantitative" SSNIP analysis. The real questions are whether *on the facts of this appeal*, the SSNIP analyses which Ofcom conducted at 1G and 10G were flawed. Those questions are Issues 2 and 3.

173. We therefore answer Issue 1 in the negative.

(3) Issues 2 and 3: preliminary discussion

174. Issues 2 and 3 concern whether Ofcom erred in its assessment of the outcome of a SSNIP for lower bandwidth services (**"the 1G SSNIP"**) or VHB services (**"the 10G SSNIP"**). The issues are worded as follows:

(1) Issue 2: whether Ofcom erred in its conclusion that a SSNIP for 1G Ethernet would be rendered unprofitable by a sufficient demand-side response.

(2) Issue 3: whether Ofcom erred in its conclusion that a SSNIP for 10G Ethernet would be rendered unprofitable by a sufficient demand-side response.

175. In subsection (a) we briefly summarise Ofcom's findings in the FS; and in subsection (b) we then set out a roadmap of the order in which we plan to analyse the various categories of evidence relevant to these issues.

(a) The Final Statement

176. The FS considered product market definition in section 4.2. Section 4.2.1 contained an introduction to the topic (FS 4.7 to 4.9), but the main body of the analysis was set out in section 4.2.2, in particular at subsections 4.2.2.3 and 4.2.2.4. The key subheadings (modified for ease of comprehension) within these subsections (which follow Ofcom's general introduction in subsection 4.2.2.1 and its summary of its provisional findings in its May 2015

consultation in subsection 4.2.2.2) and the key findings can be summarised as follows.

4.2.2.3 Ofcom's further analysis [undertaken following the consultation] (FS 4.43 to 4.103).

177. Following the consultation, Ofcom gathered and analysed four further sources of evidence, in particular:

(i) Further pricing information to permit an updated analysis of pricing differentials for different services. This information was considered at FS 4.45 to 4.52. Ofcom found that the narrowing of prices between 1G and 10G services meant that "switching in response to a SSNIP at 1Gbit/s is likely" (FS 4.52). In particular, Ofcom noted:

- For users with demand of 2G, the choice between taking two 1G circuits (**"2x1G"**) or a single 10G circuit was "finely balanced" (FS 4.49).

- Although a 1G circuit would be the cheapest way to satisfy a demand of 1G, a relatively small change in price from current levels may be sufficient to trigger "material amounts of switching" because many users have elastic demand. Further, a "material proportion" of current 1G users would upgrade in the near future and a change in relative prices may bring forward the point at which migration becomes attractive (FS 4.50 to 4.51).

(ii) Survey evidence from the Business Access segment (the **"BDRC Survey"**). This evidence was considered at FS 4.53 to 4.82. Ofcom sought information in particular regarding:

- Price sensitivity (FS 4.56 to 4.63), why users purchased their current service (FS 4.64 to 4.69) and users' consideration of alternative connectivity services (FS 4.71 to 4.73). Ofcom found that the evidence "suggests that a large proportion of end-users would take active steps to avoid a price increase" (FS 4.61); that the evidence suggests "that a decision to migrate is sensitive to movements in relative price" (FS 4.70); and that the evidence suggests "end users actively consider leased line services of different speeds as alternative ways to meet their business connectivity demand" and that they "appear to place weight on relative prices, which could […] be reflected in a greater willingness to switch in future" (FS 4.74).

- Users' anticipated migration plans (FS 4.75 to 4.76) and their historic experience of the ease of switching (FS 4.78 to 4.82). Ofcom found that the evidence was consistent with other evidence that there would be "a material amount of migration towards VHB within this review period" (FS 4.77). Ofcom found that the evidence suggested that users do not consider migration to VHB to be more difficult or costly compared to migration to lower bandwidth services (FS 4.81-4.82).

(iii) Further information from BT and VM including, in particular, certain BT's internal documents concerning the 10G EAD service which had been launched following the consultation. This evidence was considered at FS 4.83 to 4.94. Ofcom concluded that:

- BT's marketing materials indicated that 1G users were one of the target groups for the 10G EAD product (FS 4.87).

- BT's 10G EAD pricing document provided "strong evidence of pricing interdependence with 1G services" (FS 4.88).

- The introduction of the 10G EAD product was motivated, at least in part, by growing demand for a lower cost VHB service, which was, in Ofcom's view, consistent with demand for VHB becoming increasingly 'standardised' (FS 4.89).

- The fact that BT discussed the price of the 10G product internally in terms of multiples of the 1G price indicated that relative prices of its 1G and 10G circuits was a "key decision variable" and was therefore further evidence of pricing interdependence (FS 4.92).

(iv) Direct pricing discussions with six industry participants. This evidence was considered at FS 4.95 to 4.101. Ofcom found that these discussions:

- Supported the view that there is "strong pricing interdependence throughout the bandwidth chain" and that there exists substitutability between 1G and 10G, especially for users with demand for 2G or 3G (FS 4.96).

- Indicated that switching costs are not significant enough to affect the decision to migrate (FS 4.99).

178. Ofcom's overall conclusion was expressed in FS 4.102 as follows:

> "Taken together, we consider the new evidence and analysis provides further support for the following conclusions:
>
> a) There is a high degree of functional substitutability across the bandwidth range.

b) Material amounts of migration from lower bandwidth CISBO to VHB are anticipated over the next few years, and the migration decision is sensitive to price.

c) Price differentials have narrowed significantly since the last review, such that the gap between Ethernet services at 1Gbit/s and 10Gbit/s is very similar to the bandwidth gradient observed lower down the chain, and to the gap between 100Mbit/s and 1Gbit/s Ethernet services considered part of the same (AISBO) market in the 2013 BCMR Statement. Users at all bandwidths are sensitive to prices and would consider migration in response to a SSNIP.

d) Switching costs do not appear to be a material barrier to migration, and are not higher (as a proportion of prices) when migrating to VHB than when migrating to lower bandwidth CISBO services.

e) Prices appear to reflect a significant degree of demand- and supply-side interaction between 1Gbit/s and VHB services."

4.2.2.4 Overall analysis and consideration of specific stakeholder comments (FS 4.104 to 4.244).

179. This section contained Ofcom's overall conclusions and analysis in the light of the stakeholder comments and further analyses of evidence considered in the preceding section.

180. The core of Ofcom's reasoning, including as to why it was departing from the position it reached in the BCMR 2013, was set out at FS 4.135 to 4.139:

> "4.135 In the BCMR 2013, we found that, at the time, there was a clear break in the product chain between 1Gbit/s Ethernet services on the one hand, and higher bandwidth Ethernet and WDM services of any bandwidth on the other hand. The primary evidence we relied on was the substantially higher costs of the equipment used to provide MISBO services (both Ethernet >1Gbit/s and WDM services) and also the large step change in the per circuit price when moving from 1Gbit/s to above 1Gbit/s Ethernet services. We considered that this significant price difference, which the available evidence suggested could be explained by equipment cost differences, made it unlikely that there would be material substitution between circuits of more than 1Gbit/s and lower bandwidth circuits. In other words, users would be unlikely to respond to a small price change given large cost-related differences in prices of different bandwidths.
>
> […]
>
> 4.137 Evidence gathered for this review suggests there have been material changes. Price differentials have declined significantly such that we may now expect to see significant switching to VHB services in response to a SSNIP on lower bandwidth CISBO services (and vice versa). Whilst differentials remain, our pricing meetings with CPs suggest these are now

> consistent with differences lower down the bandwidth chain and are not sufficiently large to deter switching. As noted above in relation to our discussion of Figure 4.1, BT's new EAD 10Gbit/s service offers ten times the capacity of a 1Gbit/s Ethernet service for approximately double the price. We observe that in the 2013 BCMR Statement, we included 100Mbit/s and 1Gbit/s Ethernet services in the same (AISBO) market, and these services had a similar price differential.
>
> 4.138 The evidence on migration trends from the Analysys Mason […] and the February 2016 BDRC CI surveys, from CPs' internal documents and from our discussions with CPs, suggests that demand for bandwidth continues to increase and that a material proportion of lower bandwidth users is likely to consider upgrading to VHB services over this review period. Results from the February 2016 BDRC CI survey support the view that the decision to migrate is heavily influenced by price, suggesting a SSNIP on lower bandwidth products would be likely to bring forward the migration decision for a material group of lower bandwidth users. Moreover, internal documents from CPs suggest they are pricing services with a view to influencing the migration decision from 1Gbit/s to VHB.
>
> 4.139 Despite these migration trends, the February 2016 BDRC CI Survey suggests the potential for substitution is not one way. A material proportion of current VHB service users indicated they would consider switching to a lower specification service (for example, by reducing bandwidth or number of lines) in response to a SSNIP. As those users who recalled migrating cited changes in price as an important factor in the decision to migrate, it is perhaps unsurprising that an increase in the higher bandwidth service might then trigger switching back to a lower bandwidth service. The same survey showed a high degree of similarity in usage of 1Gbit/s and VHB services, suggesting the potential for functional substitutability in both directions. These pieces of evidence suggest the potential for demand-side switching down the bandwidth chain, as well as up."

181. As can be seen from the above extract, Ofcom dealt with the 1G SSNIP and 10G SSNIP in a combined analysis, rather than separately. The FS proceeded to discuss in greater detail the factors relied upon to reach the conclusion that a single product market exists, as follows:

(i) A "technical assessment", which led Ofcom to find that service features and quality between WDM services and Ethernet services had become less significant since the BCMR 2013 (FS 4.144 to 4.148).

(ii) A discussion of "price differentials", in which Ofcom found that a narrowing of the prices differences for the purchase of lower bandwidth and VHB services pointed towards a single product market (FS 4.149 to 4.178).

(iii) A discussion of "cost differentials" in the cost of equipment used for lower bandwidth and VHB services, which Ofcom considered pointed towards a single product market (FS 4.179 to 4.192).

(iv) A discussion of an overlap in the prices of 1G Ethernet and 1G WDM services, which Ofcom also considered as evidence of a single product market (FS 4.193 to 4.206).

(v) A discussion of switching costs, where Ofcom concluded that there was no material barrier to migration from 1G to VHB in response to a SSNIP (FS 4.207 to 4.216).

(vi) A discussion of migration trends towards VHB during the course of the review period, which Ofcom considered also supported a finding of a single product market (FS 4.217 to 4.234).

182. Ofcom's SSNIP analysis was also summarised in FS4.162 to 4.167 as follows:

> "4.162 […] we apply a qualitative SSNIP framework in assessing the likely degree of switching from 1Gbit/s to 10Gbit/s in response to a small but significant increase in the price of 1Gbit/s services. We do this by first looking at price differentials across the bandwidth chain and then considering evidence on price sensitivity and any barriers to switching.
>
> 4.163 As set out in paragraphs 4.45 to 4.52 above in our updated analysis of prices, price differentials have narrowed considerably since 2013. The resulting degree of substitutability between 1Gbit/s and 10Gbit/s services will depend to an extent on the distribution of end user demands for bandwidth, which we are unable to observe. As noted above, users wanting 2Gbit/s will already face a finely balanced choice at the margin and the degree of substitutability could be very high. At 3Gbit/s and above, users may already find it cheaper to switch to 10Gbit/s. Our discussions with CPs suggest that where increments of 1Gbit/s are involved, multiple 1Gbit/s circuits and single 10Gbit/s circuits (with excess capacity) are used interchangeably (for example our discussions with Vodafone and SixDegrees). A change in the relative price of services for these users could be expected to prompt a significant volume of switching.
>
> 4.164 Indeed, we discuss in paragraph 4.175 below evidence presented by Analysys-Mason that suggests demand for multiple 1Gbit/s is a significant proportion of BT's 1Gbit/s EAD volumes (20%). If this demand were representative of the wider market, then in the context of the SSNIP test, 20%

> is a material proportion of links that are likely to be highly sensitive to small changes in relative prices of 1Gbit/s and 10Gbit/s services.
>
> 4.165 Even for users currently taking a single 1Gbit/s circuit only, we consider there is potential for a material degree of switching to a 10Gbit/s circuit in response to a further narrowing of the differential (such as might be seen following a SSNIP at 1Gbit/s). The evidence we have seen from the Analysys Mason survey for Openreach, our own BDRC CI survey, CPs' internal documents and pricing meetings with CPs suggest that a material proportion of current users of 1Gbit/s are likely to migrate to 10Gbit/s services within the course of this review period. The February 2016 BDRC CI survey suggests this decision to migrate is likely to be sensitive to price, which is consistent with our understanding from CPs' internal documents that some CPs are trying to encourage this migration through the way they set their prices of 10Gbit/s services. In light of our assessment that the costs of migrating between bandwidths are likely to be insignificant (see below) and in any event less relevant in a context of increasing demand for bandwidth, we conclude that there is potential for switching between 1Gbit/s and 10Gbit/s services in response to a small relative increase in price of 1Gbit/s.
>
> 4.166 In response to BT's comment that we should exclude from our assessment of switching those customers who plan to migrate anyway, we disagree. For an assessment of whether a SSNIP would be profitable for a hypothetical monopolist of 1Gbit/s services today, the migration that would occur earlier than planned as a result of any SSNIP is a relevant constraint as it would result in a reduction of revenues relative to the counterfactual. In the wider context of considering whether there is still a break in the chain of substitution at 1Gbit/s for the forward-looking period covered by this review, the fact that a material proportion of users of 1Gbit/s plan to migrate to 10Gbit/s is also relevant as the new users of VHB services will increasingly be those who have recently migrated from lower bandwidths. As discussed in Annex 5, BT is likely to have an advantage in retaining its existing share of these customers as they migrate.
>
> 4.167 We also find evidence from the February 2016 BDRC CI survey of the potential for switching in the reverse direction, i.e. for current users of VHB services to switch to (multiple) 1Gbit/s services if they were faced with an increase in the price of their service (see paragraph 4.139 above). This provides further support for a chain of substitution linking 1Gbit/s with VHB services as it suggests that switching could occur both up and down the chain for these bandwidths."

183. In Ofcom's written evidence on the appeal, Ms. Curry explained Ofcom's approach to the different types of evidence that it had considered in coming to its view on product market definition.

> "56. This evidence included direct evidence of pricing interaction between VHB and lower bandwidth CISBO services (including CPs' internal pricing documents and discussions with CPs about their pricing strategies). I find this direct evidence of price interactions to be the most compelling evidence source considered by Ofcom in its review. This is because it provides a direct answer to the ultimate aim of product market definition, namely identifying which (if any) alternative services exert a sufficiently strong competitive constraint on the service in question so as to affect its prices.

> 57. In contrast, other sources of evidence typically considered in relation to product market definition may provide an indication that one service is likely to exert a competitive constraint on another, but does not provide direct evidence that it actually does in practice. In my view, where actual evidence of the price of one type of service being constrained in practice by another is available, it will typically be appropriate for this evidence to carry more weight than a theoretical exercise designed to help understand whether such constraints are likely to exist."

184. This evidence made clear that Ofcom had in fact placed most weight upon its interpretation of the internal documents from BT and its discussions with other CPs about pricing in forming a view of whether the 1G and 10G services imposed sufficiently strong competitive contraints upon each other. It also appeared that Ms. Curry was expressing an (expert) opinion that it was appropriate to place less weight upon the "theoretical exercise", i.e. the HMT.

185. Coupled with the very few references in the Final Statement to "profitability", this led BT to suggest to Ms. Curry that Ofcom had not in fact addressed the critical question of the profitability of a SSNIP at all. Ms. Curry's answer was that the question of the profitability or otherwise of a SSNIP had been considered by Ofcom and was implicit in the analysis in the FS:

> **Q (Mr Beard)** But then we do not have any further references to the word "unprofitable" throughout the relevant section on product market definition at all. We have references to it in the section on geographic market definition. There is a reference to unprofitable in the SMP chapter, and there is a reference to it in relation to Hull. But the word "unprofitable" is only used there in setting out the test. The truth is that Ofcom actually made no attempt to assess whether a SSNIP at 1G or 10G would be unprofitable, did it?
>
> **A (Ms Curry)** I do not think that is true, no. Ofcom considered a huge amount of evidence on the substitutability between 1G and 10G and presented various sources of evidence pointing towards different groups of users who are likely to be very sensitive to a change in the relative price of 1G and 10G. Ofcom's focus in the drafting was on substitutability between these two services from the perspective of end users and their likely price sensitivity. It may not have explicitly used the word "unprofitable", but all that analysis of the degree of substitutability and of price sensitivity and of the likely quantum of these users who would fall in that marginal category – all of that

was evidence that was relevant to a SSNIP test. [19]

186. The FS did not explicitly set out the factors that Ofcom considered would go into its analysis of the profitability of a SSNIP, but in her written evidence, Ms Curry set out her view of the multiple sources of the constraint which she contended would act upon a hypothetical monopolist of 1G services (para 60) and the hypothetical monopolist of 10G services (para 61). It is helpful to set out paras 60 and 61 of Ms. Curry's statement in full, as they came to be used by counsel as an analytical tool during the hearing:

> "60. I consider that the evidence Ofcom presented in the FS, taken in the round, suggests a SSNIP on 1Gbit/s Ethernet connections would be likely to be rendered unprofitable by the constraint imposed by VHB services (including 10Gbit/s Ethernet and 1Gbit/s WDM services). I consider this constraint would be likely to come from the following different sources:
>
> a. Some users of a 1Gbit/s Ethernet service may switch to a 1Gbit/s WDM service;
>
> b. Some users currently taking multiple 1Gbit/s circuits are likely to switch to a single 10Gbit/s circuit;
>
> c. Some users currently taking a single 1Gbit/s circuit may switch to a 10Gbit/s circuit;
>
> d. Some customers who planned to migrate to 10Gbit/s are likely to bring forward the date of their migration;
>
> e. Some customers who planned to meet increasing bandwidth demand through additional 1Gbit/s circuits are likely to decide to upgrade to 10Gbit/s instead;
>
> f. Some new customers (or customers setting up a new site) are likely to opt for a 10Gbit/s Ethernet service rather than one or more 1Gbit/s Ethernet circuits.
>
> 61. I also consider that the evidence Ofcom presented, taken in the round, suggests a SSNIP on 10Gbit/s Ethernet connections would be likely to be rendered unprofitable by the constraint from lower bandwidth Ethernet connections (and particularly 1Gbit/s Ethernet services). I consider this constraint would be likely to come from the following sources:
>
> a. Some customers of lower bandwidth Ethernet services that were intending to migrate to a 10Gbit/s Ethernet service are likely to delay doing so;

[19] T10/1257.

> b. Some customers of lower bandwidth Ethernet services that were intending to migrate to a 10Gbit/s Ethernet service are likely to decide not to do so;
>
> c. Some new customers (or customers setting up a new site) are likely to opt for one or more 1Gbit/s Ethernet circuits rather than a 10Gbit/s Ethernet service; and
>
> d. Some existing 10Gbit/s Ethernet customers may replace their existing connection with one or more 1Gbit/s Ethernet connections."
>
> (Footnotes omitted.)

187. At the outset, and importantly, we note that in relation to the SSNIP at 10G, Ofcom placed little or no reliance upon the effect of a 10G SSNIP upon existing customers of the 10G Ethernet service (Ms. Curry's para 61(d)). Ofcom conceded at para 161 of its Defence that the prospect of users 'switching down' from VHB to 1G "is likely to be relatively rare given the general trend towards higher bandwidth services." Ms. Curry also accepted (slightly reluctantly) in cross-examination that this was so:

Q (Mr Beard)	On these agreed [TCO] figures, no one who is already taking 10G is realistically going to switch down to multiples of 1G, are they?
A (Ms Curry)	It is unlikely.
Q (Mr Beard)	It is more than unlikely. It is just not credible really, is it?
A (Ms Curry)	On these assumptions, but I think I have made the point before that they are not necessarily generally applicable and there may be other set-ups, different distances, different time periods, and so on, for whom that calculation might not be right and given that the choice between 2G and 10G is very finely balanced at the 2G mark, there may be some users for whom it would be cheaper. I would agree, though, as a general principle, that it is relatively unlikely that someone who already has 10G would consider trading down to a lower specification service in light of the general trend for increasing bandwidth.
Q (The Chairman)	And also because … they would have already presumably decided not to go for resilience if they were already taking a single 10G?
A (Ms Curry)	Yes.
Q (Professor Cubbin)	For example, if they found that 10G was far greater than their needs, then in those circumstances they might ----
A (Ms Curry)	And if there were a cost saving attached to it, yes,

then they might consider, but I think in the general context where everyone is expecting that they might like more in the future, it is relatively unlikely.

Q (Mr Beard) So we have dealt with multiples. Let us consider the possibility of switching down from a single unit of 10G to a single unit of 1G. The position is that the single unit of 1G is already much cheaper than a single unit of 10G, is it not?

A (Ms Curry) Yes.

Q (Mr Beard) That is so even including a connection charge?

A (Ms Curry) Yes.

Q (Mr Beard) If you have chosen to take 10G before a SSNIP on 10G rather than taking 1G, there is no realistic possibility of you shifting down to take 1G after a SSNIP, is there?

A (Ms Curry) Again, I think it is unlikely. I would not rule it out. I think there is likely to be a degree of elasticity of demand for bandwidth and you may find there are some users for whom a change in the relative price would cause them to switch down. As I said, it is relatively unlikely in this market, but I certainly could not rule it out.[20]

188. This was a significant departure from Ofcom's findings at FS 4.139 and FS 4.167 that:

> "4.139 Despite these migration trends, the February 2016 BDRC CI Survey suggests the potential for substitution is not one way. A material proportion of current VHB service users indicated they would consider switching to a lower specification service (for example, by reducing bandwidth or number of lines) in response to a SSNIP […] These pieces of evidence suggest the potential for demand-side switching down the bandwidth chain, as well as up.
>
> […]
>
> 4.167 We also find evidence from the February 2016 BDRC CI survey of the potential for switching in the reverse direction, i.e. for current users of VHB services to switch to (multiple) 1Gbit/s services if they were faced with an increase in the price of their service (see paragraph 4.139 above). This provides further support for a chain of substitution linking 1Gbit/s with VHB services as it suggests that switching could occur both up and down the chain for these bandwidths."

[20] T12/1164-1166.

189. This change of position by Ofcom meant that in relation to the SSNIP at 10G, attention focussed on the effect of a SSNIP on existing 1G and new customers identified in paragraphs 61(a)-(c) of Ms. Curry's statement.

(b) Roadmap of our analysis of issues 2 and 3

190. We start our analysis of Ofcom's decision by considering the evidence that Ofcom and Ms. Curry considered was "compelling" direct evidence of price interactions between 1G and 10G, namely (i) BT's internal documents which concerned the launch of its 10G EAD product, and (ii) Ofcom's pricing discussions with six CPs. BT disputed Ofcom's assessment of its internal documents and argued that the pricing discussion materials did not support the view that pricing interactions occur between 1G and 10G. We address BT's internal documents in section F(4) below and the pricing discussions in section F(5) below.

191. Second, we consider the five other items of indirect evidence which Ofcom contended supported the conclusion that the products at 1G and 10G exerted a sufficient competitive constraint on each other. The five categories of evidence were:

(1) Evidence that users' demand is not fixed, but rather is elastic and responsive to price (i.e. users are price-sensitive). This, in Ofcom's view, was supported by the BDRC Survey results and BT's internal documents but was countered by evidence from BT and VM on the one hand and supported by evidence submitted by the CP Group on the other.

(2) Evidence of the narrowing of price differentials between 1G and 10G which (in Ofcom's view) indicated that the choice between 1G and 10G has become "finely balanced" at the margins (i.e. for users with demand of bandwidth of ca. 2G), and that other users with less demand might also upgrade or push forward a planned migration in response to a 1G SSNIP. These conclusions were challenged by BT, primarily through total cost of ownership ("**TCO**") analyses produced by Dr

Yardley. VM also produced evidence regarding the pricing of its WDM services and argued that Ofcom had misunderstood the pricing of its products.

(3) Evidence that there is a material number of 1G users with demand at around 2G which could be fulfilled by multiple 1G circuits or a single 10G circuit. This was highly relevant to the 1G SSNIP analysis because these are the marginal users most likely to switch in response to a price rise at 1G. Hence the larger the number of marginal users, the more likely a SSNIP would be unprofitable. As indicated in FS 4.164, Ofcom relied on figures from Analysys Mason supplied by BT which Ofcom understood indicated that multiple links accounted for around 20% of BT's 1G volumes. It transpired, however, that the information provided was incorrect, and on the appeal, BT relied upon new estimates produced by Mr Logan. Ofcom accepted that the new, lower, estimate of multiple links was more accurate, but argued that the numbers were still material.

(4) Evidence that there would be substantial upward migration during the review period. Because Ofcom had accepted that instances of "switching down" from 10G to 1G would be rare, the question of upward migration from 1G became especially relevant to a SSNIP at 10G. The larger the amount of upward migration, the more impact that delay of that migration would have on a 10G hypothetical monopolist's profits. BT argued that Ofcom's estimates of migration were overstated, and there was a further dispute between the parties both as to the period over which the 10G SSNIP test should be performed and how to treat revenues not received as a consequence of delays in upwards migration.

(5) Evidence that switching costs would not be significant enough to affect a decision to migrate from 1G to 10G, such as to exclude or limit competitive interactions between these services. BT argued that these costs are considerable and not adequately addressed in the FS.

192. We examine each of these categories of evidence in sections F(6) to F(10) below. After our consideration of these issues, we consider the evidence in the round in relation to the 1G SSNIP in section F(11) below and the 10G SSNIP in section F(12). We make certain further observations regarding the analysis of chain of substitution in section F(13). Our overall conclusions are set out in section F(14).

(4) Issues 2.6 and 3.6: whether BT's internal documents support a finding of direct pricing interactions between 1G and 10G

(a) Board papers

193. The first set of internal BT documents which Ms. Curry described as "the most compelling evidence" of an alternative service exerting "a sufficiently strong competitive constraint upon the service in question so as to affect its prices" consisted of a number of documents prepared for Openreach's Investment Board and its Commercial Policy Board in 2014 and 2015 concerning the introduction by BT of a new EAD 10G product.

194. BT raised a general objection to Ofcom's approach in relation to these documents. It complained that Ofcom had simply formed its own view of the contents of these documents and had not sought to verify or investigate with the authors of the documents that the underlying facts were as Ofcom had surmised. The witnesses from BT sought to address that omission by explaining in their evidence what their intention had been in drafting the documents in the form that they took. We think that Ofcom was *prima facie* entitled to assume that the underlying facts were consistent with the ordinary and natural meaning of the words used in the documents; and we shall approach matters in the same way.

195. The first such document was a business case requesting the approval of the Investment Board to the development and launch of what was described as a "new 10Gbit variant of the EAD product" (the "**Investment Board Paper**"). The essential business driver identified in the Investment Board Paper was that the bandwidth needs of customers were increasing and that there was

accordingly an increasing growth in demand for a 10G service across the business (large corporates and enterprises) and infrastructure (backhaul) markets. The Investment Board Paper made the point that customers regarded price and TCO as the most critical factors when choosing a supplier and warned that Openreach's existing 10G optical and WES services were too expensive in comparison to Openreach's competitors such as Colt, Virgin Media and Zayo, who could offer more attractive pricing on 10G products. The paper suggested that customers often wanted a simple ethernet 10G solution, and that by launching EAD 10G, Openreach would have the opportunity to capture more of the 10G market.

196. The issue of pricing the new 10G product was then directly addressed in the Investment Board Paper. After pointing out that the new EAD 10G service could be offered at a significantly lower cost than Openreach's existing 10G product, the paper continued:

> "Easier for customers to consume. The introduction of an EAD 10G will also help limit churn, particularly from our EAD 1G customers. Currently, customers reaching capacity on a EAD 1G service often look to purchase a second EAD 1G service to provide the additional capacity required, or they churn to one of our competitors. EAD 10G will ensure there is an Openreach EAD 10G service customers can upgrade to, rather than churn to a competitor, and the solution will support them as their bandwidth needs continue to grow.
>
> The 10G market and our competitors' pricing are continually evolving, therefore pricing principles presented are latest indicative thinking only, and final pricing will be set in summer 2015 to ensure it is still competitive
>
> […]
>
> Our intended price for EAD 10G is 2.5 – 3 times the post price review EAD 1G service, which aligns to industry expectation and specific price point feedback from CPs. This would deliver a 3 year TCO … slightly higher than Zayo and Virgin discount rate, though currently still a competitively price point [sic] in the market […] Increasing pricing beyond 3 times EAD 1G pricing will compromise its competitiveness in the market, representing a higher 3 year TCO than competitors and exceeding the price point industry have advised needs to be achieved."

197. Although reference is made to the pricing of the new 10G product in terms of multiples of the 1G product, we accept BT's contention that, read as a whole and in context, this evidence does not provide any support for the proposition that the pricing of the new EAD 10G product was actually constrained by the

price of EAD 1G products, or even any multiples of the EAD 1G product. Instead, we consider that the document shows that the thrust of the proposal and the consideration given to it by BT was to ensure that Openreach had a new EAD 10G product that was competitive in the 10G marketplace. Although expressed in multiples of the 1G price, the price of that new 10G product was not actually set by reference to the 1G product, but by reference to the relative price and TCO of the existing 10G products from competitors in the 10G market.

198. The Investment Board Paper also clearly indentified that some of the custom for the new EAD 10G product would come from existing 1G customers whose bandwidth would be expected to increase beyond 1G, as well as from customers who already took BT's more expensive 10G products. BT therefore modelled various assumed cases for the substitution or migration of new and existing customers to the new EAD 10G product from Openreach's existing products. This concentrated upon the substitution or migration from BT's existing 10G products to the new 10G product, but also assumed that […]% [✂] of new EAD 1G connections would take EAD 10G instead. In relation to the existing EAD 1G customers, the paper stated:

> […][✂]

199. The analysis also identified the incremental costs and benefits to such customers who had a higher bandwidth need of taking up a new EAD 10G connection. The paper pointed out that although a single EAD 1G connection was cheaper, it did not deliver the required bandwidth, but that at 3 EAD 1G circuits it became cheaper for the customer to purchase a 10G circuit than multiple lower bandwidth circuits.

200. These points as regards the potential for substitution or migration from the existing 1G customer base and any new connections to the new EAD 10G product were, however, not further developed in the Investment Board Paper. In particular, there was no analysis, either in this document, or the spreadsheet that was attached to it, or in subsequent documents, as to how much more or

less migration from 1G to the new 10G product might be expected if the price of the 10G product was altered in any way.

201. As such, although the paper clearly shows that BT expected that a new EAD 10G product might provide an alternative to multiple EAD 1G circuits for customers whose bandwidth needs exceeded EAD 1G, and that BT was at least alive to the possibility that the introduction of a new EAD 10G product might therefore have an effect over time on its existing 1GB customer base as well as its existing 10G customers, we do not think that the Investment Board Paper provides any real support for a conclusion that the decision as to the pricing of the new EAD 10G product was actually influenced or constrained by the price of the existing EAD 1G product.

202. The question of the indicative pricing of the new EAD 10G product that would be announced to the industry for comments was considered in a proposal to the Commercial Policy Board in March 2015 ("the **Indicative Pricing Paper**"). That paper proposed that the indicative price to be shared with the industry should be 3 times the current EAD 1G price. After considering how long this price would take to "payback" BT, the paper continued:

> "We believe pricing at this level would also represent a competitive price in the market, based upon insight received on competitor pricing."

That belief was supported by a table that compared the indicative price against the pricing of […][✂]. It was also supported by a comment under the heading "Any other key issues" that stated:

> "**EAD 10G Price Point Right Level**: EAD 10Gb price point is proposed to be set at the higher level of industry requirements, allowing scope to reduce further in the future if required, to ensure competitive position in the market."

203. After the comparison to […][✂], the Indicative Pricing Paper then continued:

> "Pricing at this level would:
>
> - **Ensure pricing aligns with historic bandwidth ratios**: EAD 10Gb should be less than or equal to 3 times 1Gb. Pricing higher than 3 times would reinforce a perception we are exploiting the bandwidth gradient linked to greater than 1Gb de-regulation and passives (See Annex 2 for more detail)."

The document then cross-referenced an Annex which dealt with the potential outcome of the BCMR.

204. Ofcom suggested that this last comment showed that the price of the new 10G service was being directly limited by the price of the 1G service. We do not read the observation in the same way. Instead we think that the document was warning that if the new 10G price exceeded three times the 1G price, the price of the 10G product might be seen by Ofcom as out of line with the prices for other products, and thus as an example of BT seeking to position itself to profit from the anticipated de-regulation of the 10G ("greater than 1G") market.

205. Mr. Logan, who was named as the "sponsor" of the Indicative Pricing Paper, gave evidence that BT's concern was that this might increase the risk of Ofcom imposing a DFA remedy in the BCMR 2016 and that the comment had nothing to do with the potential for substitution between the 1G and 10G products. He was not cross-examined on this explanation, which seems to us to correspond with the wording of this comment in the document.

206. The Indicative Pricing Paper did address the possibility that the introduction of EAD 10G might have some "substitutional impacts on other portfolio products as a result of […] giving CPs increased portfolio choice", and referred to a table in an Annex entitled "cross portfolio impacts". This table simply set out the same assumptions as in the earlier Investment Board Paper, but then contained a caveat:

> "There is a degree of uncertainty around EAD 1Gb to EAD 10Gb substitution, though EAD 1Gb and EAD 10Gb will service different customer needs and are therefore not directly substitutional."

207. As with the Investment Board Paper, although this shows that the Commercial Policy Board would have been concerned to understand the potential impact of introduction of a new EAD 10G service on the existing and predicted new customer base for BT's EAD 1G product, we do not consider that this paper provides any evidence of the price of the new EAD 10G product being constrained or influenced by concern for the erosion of the existing EAD 1G

customer base. The analysis in this respect was based upon some rather basic assumptions that were simply noted to be uncertain, and they were not developed further or tied by any analysis to the pricing decision for the new 10G product.

208. The launch pricing of the new EAD 10G service was then reconsidered in a paper (the "**Launch Pricing Paper**") produced for Openreach's Commercial Policy Board in late April 2015. The Launch Pricing Paper was produced in the light of the industry feedback from the indicative pricing, together with the issue of the BCMR consultation document containing the Dark Fibre proposal which (it was reported) had created downward pressure on the pricing for high bandwidth products of 10G and above. The Launch Pricing Paper stated:

> "Considering this, and additional customer feedback received from our indicative pricing of 3 times current 1G EAD pricing, we recommend a 1 year minimum period price of 2.6 times current EAD 1G pricing to ensure competitiveness in the market. Ahead of the proposed availability of Dark Fibre products from April 2017, we also recommend an aggressive 5 year minimum period price to reduce our migration exposure and risk of customer churn to Dark Fibre products".

209. Although the paper then set out tables containing the "bandwidth gradient" against the price and TCO of the existing EAD 100 M and EAD 1G circuits, we do not regard this as evidence that the price of the new EAD 10G circuit was in fact being set or constrained by reference to the price of a EAD 1 G product. Although BT was plainly interested to understand how the pricing of the new EAD 10G product compared with the pricing of its other products, such matters were not relied upon as part of the justification for the setting of the launch price, and again there was no suggestion that the price of the EAD 10G service should be tied in any way to the price of the EAD 1G service so as, for example, to move in lockstep with the 1G price.

210. Instead, the Launch Pricing Paper made it very clear - in a section headed "Pricing proposed and rationale" that the rationale for the selection of the price of the new EAD 10G product was set to ensure that it was competitive in the

market against the rival 10G products offered by other companies. The relevant section of the paper stated:

> "Rationale for 1 Year Minimum Period at 2.6 times the current EAD 1G Price
>
> Customers consider Total Cost of Ownership (TCO) to be amongst the most critical factors when choosing a supplier because they require low cost 10G solutions. In addition, the 10G market is increasingly competitive and our key competitor in the market on a national scale is Virgin media. Within London the key players with the most market share are Colt and Zayo who compete with us alongside Virgin media.
>
> Feedback from our indicative pricing of 3 times current EAD 1G pricing is that this would sit on the higher end of the market and would be above Virgin Media and other key London players on a 3Yr. TCO. Our recommended pricing will allow us to be competitive on a national scale, including in London. A graph showing EAD 10G prices vs. the 10G market is shown below…."

There then followed a bar chart showing how the 3 year TCO of Openreach's new EAD 10G product would compare with the comparable products from Zayo, Virgin (with and without a discount) and COLT. The Launch Pricing Paper concluded:

> "Based on the above, we recommend reducing the bandwidth gradient for the EAD 10G launch pricing from the indicative 3 times, to a more competitive 2.6 times EAD 1G pricing."

211. In summary, therefore, we do not accept that the fact that BT was expressing its launch pricing of the new EAD 10G product internally as a multiple of the price of its EAD 1G product provides any support for Ofcom's conclusion that the two products were in general terms substitutable; and nor do we accept that the documents support the conclusion that the price of the EAD 1G product acted as a constraint on the price of the 10G product (or vice versa).

(b) Marketing materials

212. In its Final Statement and Ms. Curry's evidence, Ofcom also sought to attach considerable weight to the manner in which Openreach's new 10G product was to be targeted and marketed to customers.

213. For example, attached to the Investment Board Paper was a document describing how the EAD 10G product was to be marketed. The key points identified in the summary in the document were the competitiveness of the 10G market and the lower prices being offered by competitors such as Colt, Level 3 and Virgin Media. The introduction of the new EAD 10G product was identified as enabling Openreach to "capture and unlock more of the 10G market" and the paper identified product development as being focussed on a more competitive price point (in that market). We consider this summary to be consistent with the Investment Board Paper and to provide no support for a conclusion that the price of the EAD 10G product was being constrained by the price of the EAD 1G product.

214. The document also identified the "Target audience" for the advertising as:

> "All customers currently consuming Ethernet services from Openreach. Particularly those consuming 1Gbit/s Ethernet services.
>
> a. Ethernet 10G is also focused on defending our existing customer base and is a mechanism to limit churn, particularly from our 1G EAD customers
> b. Incentivise customers reaching capacity on 1G EAD to move on to a 10G EAD solution."

215. Ms. Curry suggested in her oral evidence that this was a particularly significant document. She stated:

> "The description/summary is talking about the 10G market segment, and the target audience includes -- it says: "Particularly those consuming 1Gbit/s Ethernet services". I think that is strong evidence of substitutability by current 1G users for a 10G service. We have been told -- BT has repeatedly submitted that demand for these services is independent and current 1G users would have no use for these specialist VHB services and here we see evidence that the target audience included particularly those consuming 1G Ethernet services. That looks to me like a very high degree of substitutability between 1G and 10G."[21]

216. We do not read this document in the same way. We consider that, as explained by the BT witnesses, this document primarily reflected the essential reason for the introduction of the new 10G service – namely to provide a far cheaper EAD 10G service to BT's existing 10G customers and to minimise the

[21] T13P/40.

risk that BT's existing 1G customers who were reaching capacity on a 1G circuit might churn to Openreach's competitors who were offering a much cheaper 10G alternative. The document itself says nothing to suggest that there was a "very high degree of substitutability between 1G and 10G". It only identifies the potential for substitution of a 10G circuit for customers whose bandwidth needs were expected to exceed the capacity of a 1G circuit (i.e. those who might need multiple 1G circuits), and said nothing about the proportion of 1G customers who might be in that category.

217. In explaining her comments about a very high degree of substitutability, Ms. Curry commented:

> "I think around 80% of the demand for the new service is assumed to come from current 10G users and a further nearly 20% from users who would otherwise have taken a 1G service. And I have set out in my witness statement that I think 20% of the demand for the new service coming from 1G is a material proportion, and that to risk losing that material customer base would be a relevant factor in the pricing decision."[22]

That observation appeared to be aimed at the argument advanced by Ofcom to support its HMT analysis in relation to a SSNIP at 10G – namely that a hypothetical monopolist at 10G would be concerned to price the 10G product in such a way that he did not deter 1G consumers from trading up to a 10G circuit to fulfil their greater bandwidth needs.

218. The difficulty in relation to that evidence is that although it was the case that BT's documents showed that it anticipated that over a period of about 3 years a total of about 20% of its customers for the new EAD 10G product might come from consumers who currently took 1G circuits, there was nothing in BT's internal papers to suggest that BT actually calibrated or fixed the price of its new EAD 10G product by reference to that possibility. In other words BT's documents did not support Ms. Curry's thesis that the pricing or reaction of people taking an existing 1G product would feature in the pricing decision of a hypothetical monopolist at 10G so that one could conclude that the price of the 10G product was affected or constrained by the price of the 1G product.

[22] T13P/41.

Instead, as outlined above, it was apparent that the price of BT's EAD 10G product was set by reference to BT's competitors' prices for 10G.

219. When Openreach translated this marketing proposal into the design of its marketing materials, it chose to advertise the new 10G product by comparison to its existing 1G product. One such advertisement described the new 10G service as "an evolution of our EAD portfolio" and proclaimed:

> "FASTER FOR LESS
>
> The new EAD 10G service is a variant of our existing EAD portfolio – offering 10 times the bandwidth of 1G from around 2 times the cost."

220. Again, and contrary to Ofcom's submissions, we do not consider that this material demonstrates that the price of the new EAD 10G circuit was being constrained by the price of the existing EAD 1GB product. Whilst the marketing pitch comparing the relative speed and price of the 1G circuits and the new 10G service does point to the potential for functional substitutability between multiple 1G circuits and a 10G circuit, there is nothing to suggest that the price of the 10G circuit was being fixed by reference to the price of the 1G circuit or vice versa. Moreover, the material says nothing about the volumes of persons seeking more than 1G of bandwidth to whom the advertisement might be of interest.

221. We also accept Mr. Logan's evidence that the descriptions of the new 10G product in the advertising material as the "evolution" or as a "variant" of the existing EAD portfolio was not aimed at explaining its position in the bandwidth spectrum as Ofcom suggested, but instead reflected a desire to portray the new product as similar to Openreach's existing ethernet products with which the customer would be familiar so as to emphasise issues such as the ease of ordering. This point had already been identified in the Investment Board Paper:

> "Easy to consume 10G products. Customers often want a simple, ethernet 10G solution that does not require the wide feature set that our Optical products offer. Our Optical products also require an extensive pre-sales design cycle, which adds an inevitable delay to the customer placing order and EAD 10G would negate this […]
>
> […]

> This product will slot into the EAD product family and customers would experience a consistent service and delivery process in line with existing EAD products […]"

(c) Conclusion

222. Accordingly, we do not consider that the internal BT documents provide any support, still less that they provide any "compelling evidence", that the 1G Ethernet service was generally substitutable for the 10G service; nor do they support a conclusion that the price of BT's EAD 1G service provided any competitive constraint upon the price of its new EAD 10G service.

(5) Pricing discussions: whether Ofcom's pricing discussions with six CPs support a finding of direct pricing interactions between 1G and 10G

223. The other source of "compelling evidence" to which reference was made by Ms. Curry and in the Final Statement were pricing meetings which Ofcom had with six CPs. The Final Statement observed that:

> "Overall the discussions supported a view that there is strong pricing interdependence throughout the bandwidth chain."

That conclusion was said to be supported by summaries or extracts from the meetings with five of the six CPs. The only one not mentioned in the text of the Final Statement was Verizon.

224. The comment attributed to Colt was that:

> "the same rule of thumb for pricing bandwidth differentials applied throughout the bandwidth chain, including VHB services."

That suggests that the CP in question had indicated that prices were determined by the application of a pricing rule of thumb comparing adjacent bandwidth products to each other. However, what the note of the meeting in fact recorded in that respect was:

> "Relative pricing: the higher the bandwidth the price per Mbit/s comes down. Proportionately more for less. Multiplier of three - 10 Gbit/s is three times 1Gbit/s, 100 Gbit/s costs three times 10 Gbit/s. Broad rule of thumb is that the price increases as a square root of the increase in bandwidth."

This does not in fact indicate that the prices for different bandwidths were actually being set using a rule of thumb connecting one product to another.

225. The issue of how prices were actually set was the subject of the next comment recorded in the meeting note. That stated:

> "Setting prices: Market environment and what the competition is doing is the main determinate. Also make an allowance for the building types that are being connected."

That comment is consistent with the internal evidence from BT as to prices being fixed primarily by reference to the prices of competitors, and it does not indicate any price interdependence between bandwidths as suggested by Ofcom. That comment was not, however, referred to in the Final Statement.

226. The summary in the Final Statement of the comment made at the meeting with Zayo was also incomplete. The full note of the comment read:

> "Does price drive market demand? Actually, demand drives price. Customers change bandwidth because they need to. Once they need more bandwidth it becomes a timing issue and when to incur the cost. Vast majority of upgrades are driven by business demand. Not price - as there is not that big of a price difference, business opportunity far outweighs this. Bandwidth increase is a business decision, not a finance decision. Although businesses may possibly consider scaling back demand growth internally."

Read in full, this comment simply does not support Ofcom's thesis of substitutability between 1G and 10G or as to pricing interdependence between those services.

227. The comment Ofcom extracted from its meeting with Vodafone made the point that its pricing policy was mainly based on the distance between the customer site and the relevant network, but added that in some instances it might choose to use multiple 1G circuits rather than a 10G service because it would be cheaper. This was said by Ofcom in the FS to support the view that there was a high degree of substitutability between 1G and 10G services for some users. The relevant part of the meeting note reads:

> "Relative Prices: 10Gbit/s is around 4-6 times 1GBit/s (only 'gut feel'). The difference in price between a marginal increase from 1GB to 1.5 GB needs

> will probably need a 10GB access tail from BT, so costs increase significantly, leading to a non-linear pricing structure. In some cases we may decide to go for a 2x1Gbit/s circuit because it will be cheaper."

Whilst Ofcom is correct that this comment indicates that a 10G circuit might be seen in some cases by Vodafone as an alternative to two 1G circuits for costs reasons, we do not think that what is presented very much as an exceptional situation can be regarded as evidence of a "high degree" of substitutability between a 1G and a 10G circuit in general terms.

228. Ofcom noted but dismissed BT's observations that the pricing of the 10G service did not take into account the price of its 1G services on the basis that it was inconsistent with the evidence from Openreach's internal documents to which we have already referred above.

229. Finally, Ofcom seemingly chose (for reasons that none of the witnesses called by Ofcom could explain) not to refer to the contents of its meeting with Verizon. That meeting note included the following:

> "Ofcom asked if there were any barriers to the customer side from switching from 1Gbit/s to 10Gbit/s other than just not needing more bandwidth. Is there a case of a desire to switch but the product is just too expensive? Has Verizon seen from customers particular responses at price points. Verizon replied that no, it did not tend to see spikes in order. It stays constant regardless of relative price changes.
>
> Ofcom then queried whether what Verizon is seeing suggests that bandwidth fundamentally drives customers' requirements as opposed to being sensitive to price. Verizon replied yes and then explained that when Openreach do special offers (such as free connections) this does not drive more interest. […][✂]"

230. BT submitted, and we agree, that it is surprising that Ofcom did not include this extract from the meeting with this particular CP in the Final Statement. It provided a counterpoint to Ofcom's conclusion that there was "strong pricing interdependence throughout the bandwidth chain" because this CP was of the view that customers were fundamentally driven by bandwidth requirements and were not sensitive to price.

231. Taken as a whole, therefore, we do not consider that the discussions with CPs provided any real, still less any strong or compelling, evidential support for

Ofcom's conclusion that the prices of 1G and 10G CISBO products were interdependent.

(6) Issues 2.5 and 3.5: Price sensitivity of users of leased lines, including BDRC survey

(a) Evidence regarding price sensitivity

232. A key issue for both the 1G and 10G SSNIPs concerns the purchasing behaviour of marginal customers in response to changes in price, that is, their price sensitivity.

233. Ms Curry's view was that, "all customers are likely to show a relatively high degree of price sensitivity: particularly over some price ranges (e.g. where the price of purchasing a single higher bandwidth circuit or multiple lower bandwidth circuits becomes very similar for a given level of bandwidth demand."[23]

234. BT and VM, relying on the evidence of Mr Logan, Mr Yardley and Mr Higgins, argued that in general terms, users of leased lines were not price sensitive. Their case was that "CISBO purchasers seek to keep their costs as low as possible and do not overprovision bandwidth" because "CISBO are an overhead cost that is difficult to pass on directly to customers".[24] In his written evidence Mr Logan stated:

> "[…] In my own experience, I have not observed a willingness to pay for bandwidth in excess of the customer's bandwidth requirement. High bandwidths are purchased where specific business applications dictate this (e.g. very high bandwidth needed for financial services applications)."[25]

Commenting on the LLU and MNO sectors, Mr Yardley opined:

> "16. In general, bandwidth requirements on any given circuit will be driven by the number of customers served by that circuit and the average peak traffic per customer. An operator will generally seek to minimise the costs of

[23] Curry 1, §115.
[24] BT skeleton argument, §45.
[25] Logan 2, §55.

> meeting that bandwidth requirement whilst ensuring a suitable customer experience (or quality of service). […]
>
> 17. It is also important to note that there is little or no revenue upside for any operator in achieving a much higher quality of service than is absolutely necessary. […] [T]he value to an operator of any additional bandwidth (over and above the required bandwidth) will generally be very low, and the timing of bandwidth migrations is unlikely to be sensitive to small changes in the relative price of circuits."

In even more stark terms, Mr Higgins stated in his written evidence:

> "If a business can meet their bandwidth needs at lower cost, they will reduce their expenditure (and therefore benefit from an increased profit margin) rather than purchase additional bandwidth capability."[26]

235. In cross-examination, however, Mr Logan agreed that customers (both wholesale and retail) have differing attitudes to service: some prefer to run their links "hot" and risk a reduced service to minimise costs, whilst others will prepare to upgrade when they get to 50 or 60% of the capacity of their existing links. This would indicate that at least some users do value additional capacity above their regular usage level. Mr Logan also agreed that LLU operators are price conscious and, eventually, appeared to agree that LLU operators would consider bringing forward migration to 10G provided that the relevant node concerned was 'resilient', which he conceded would usually be the case.

236. Mr Higgins accepted in cross-examination that some bandwidth capacities are 'need to have' but others are 'nice to have' at the right price, this was the case in all three user segments (business, LLU and MNO), and that all these users could potentially benefit from additional bandwidth. Mr Higgins agreed that the timing of a decision to upgrade could be affected by pricing so that if the upgrade product was cheaper, the customer would be more likely to upgrade, whereas if a customer who wished to upgrade found the price too much, this might result in the upgrade project being deferred.

237. The evidence of Mr Reid also indicated that users cannot be said to have a 'fixed' appetite for bandwidth. Mr Reid further explained that technology

[26] Higgins 1, §6.4.

permitting greater bandwidth consumption was being developed without specific regard to customer demand. In his experience, although price is a "primary" constraint on demand, users prefer to have more bandwidth and hence will upgrade where they can get more bandwidth for the same outlay – or put another way, that provided the price is right, customers are likely to adopt newer technology.

238. The Tribunal also received unchallenged evidence from Mr Baxter of Three which supported Ofcom's case that backhaul users respond to changes in relative prices of 1G and 10G products and take these into account when considering the timing of the roll-out of upgrade programmes. Mr Baxter's evidence was that being able to roll out upgrade programmes sooner is seen as advantageous to a network since it enables the network to offer its users a higher quality of service to its consumers, for example by encouraging the use of data intensive services.[27]

239. Ofcom also relied on the BDRC survey to support its view that users in the Business Access segment were price sensitive. BT's appeal focussed considerable effort in seeking to undermine this survey evidence, as this was the only evidence of a quantitative nature relied on by Ofcom. It should, however, be emphasised that Ofcom recognised that the survey was not representative of the business access customer segment (it being based on a total of just 241 telephone interviews, including only 55 VHB users) and Ofcom placed relatively limited weight upon the survey in the FS, stating that the survey did no more than to "suggest" certain outcomes. Ms Curry also explained clearly that the survey was used to identify price sensitivity rather than as a means to estimate "diversion" rate, such as might be used in a critical loss analysis.

240. The survey questions relating most specifically to price sensitivity were referred to as "QSSNIP1" and "QSSNIP3". QSSNIP1 asked respondents how they would react if their existing supplier increased prices by 10%. QSSNIP3 asked how they would react if <u>all</u> suppliers increased prices by 10%. Half of

[27] Baxter 1, §10.

the respondents were asked QSSNIP1 followed by QSSNIP3; the remaining respondents were asked the questions in reverse order. Respondents were permitted to indicate more than one reaction to the question, hence the percentages do not total to 100. The results are set out below:

Figure 2: BDRC Survey QSSNIP1 (Survey Figure 41)

Actions (claimed) would take if HBW supplier increased price by 10% (detail)

	TOTAL	WDM**	ELL>1Gb/s WDM**	ELL ≤ 1Gb/s *	ELL ≤ 100Mb/s
I would seek to negotiate with supplier	86%	78%	78%	90%	87%
I would look into switching supplier	60%	59%	56%	65%	60%
I would look into using an alternative type of connection	46%	48%	45%	42%	49%
Avoid paying more by switching to a lower specification service (e.g. lower bandwidth, fewer lines)	21%	26%	25%	18%	21%
I would switch supplier	13%	15%	18%	6%	15%
I would use an alternative type of connection	11%	20%	22%	6%	9%
Would not take any action (i.e. I would pay the price increase)	8%	7%	9%	6%	8%
Other	3%	-	-	5%	3%
Don't know	1%	2%	2%	2%	-

QSSNIP1. If the price of your SAMPLE TYPE provision was increased by 10% by your supplier, what, if anything would you do as a result of this increase?
Base: All respondents: 241, WDM: 46/ WDM/ ELL>1Gb/s: 55/ ELL ≤ 1Gbs >100Mb/s: 62/ ELL ≤ 100Mb/s >50Mb/s: 124
The TOTAL in the charts is the total of the different sample groups. It is not a representative total of high bandwidth line users. Please see figure 1 for details.
*LOW BASE SIZE, **INDICATIVE ONLY

Figure 3: BDRC Survey QSSNIP3 (Survey Figure 43)

Actions (claimed) would take if ALL HBW suppliers increase price by 10% (detail)

	TOTAL	WDM**	ELL>1Gb/s WDM**	ELL ≤ 1Gb/s*	ELL ≤ 100Mb/s
I would seek to negotiate with supplier	82%	78%	73%	84%	85%
I would look into switching supplier	51%	52%	45%	55%	51%
I would look into using an alternative type of connection	50%	50%	44%	45%	55%
Avoid paying more by switching to a lower specification service (e.g. lower bandwidth, fewer lines)	20%	24%	22%	15%	23%
I would switch supplier	12%	15%	18% ▲	5%	12%
I would use an alternative type of connection	9%	13%	16% ▲	5%	8%
Would not take any action (i.e. I would pay fewer lines) the price increase)	13%	15%	22% ▲	8%	11%
Other	4%	4%	4%	10%	2%
Don't know	1%	2%	2%	3%	-

QSSNIP3. If the price of this ... provision increased by 10% across all suppliers, what, if anything would you do as a result of this increase?
Base: All respondents: 241, WDM: 46/ WDM/ ELL>1Gb/s: 55/ ELL ≤ 1Gbs >100Mb/s: 62/ ELL ≤ 100Mb/s >50Mb/s: 124
The TOTAL in the charts is the total of the different sample groups. It is not a representative total of high bandwidth line users. Please see figure 1 for details.
*LOW BASE SIZE, **INDICATIVE ONLY

241. BT highlighted that in response to QSSNIP3 a similar percentage of respondents indicated that they would consider switching supplier in response to a price increase by their supplier (51%) as compared with the response to QSSNIP1 when all suppliers increase price (60%). BT suggested that respondents may have been confused by the framing of the two questions so close together and that the response to QSSNIP3 was nonsensical since respondents could not hope to benefit by switching supplier if all suppliers increased prices. Ms Curry's evidence was that respondents' responses were not surprising but arose from the fact that the question was a "hybrid" SSNIP. Rather than asking about a true SSNIP question where a single supplier sells a product at a competitive price and then imposes a SSNIP on that product, QSSNIP3 asks about an increase in price across a market where purchasers know that different suppliers may be offering different prices.[28]

[28] T13/1226.

242. While he urged caution as to the use to which the survey should be put, Dr Yardley did accept that the BDRC survey provided "some evidence" of price sensitivity.[29]

(b) Analysis

243. In our view the evidence is clear that users' demand for bandwidth is not static or near-static, and that a material degree of price sensitivity exists amongst users of leased lines in all segments. To that extent we agree with Ofcom and reject BT's suggestions to the contrary. We would not, however, describe all users as exhibiting a "high" degree of sensitivity to price as Ms. Curry suggested. While no doubt users do strive to contain costs, and some users are more price sensitive than others (even amongst those with around 2G of demand), our view is that the evidence establishes that users do not pursue the objective of minimising costs blind to all other considerations. So, for example, some users may be willing to pay more for significantly increased bandwidth if that additional bandwidth can deliver identifiable strategic benefits for their business.

244. We also accept that the timing of a user's decision to upgrade from one or more 1G circuits to a 10G circuit may be influenced by the relative prices of 1G and 10G services, albeit that we do not think that we could conclude that the decision to migrate is in all cases "heavily influenced" by price as suggested in the FS.

245. One area where we consider that Ofcom did err – which it implicitly accepted in its Defence – was in its reliance on the BDRC Survey in its analysis concerning the 10G SSNIP. The relevant passages are quoted at paragraph 180 above, but we repeat FS 4.139 here for convenience:

> "[…] the February 2016 BDRC CI Survey suggests the potential for substitution is not one way. A material proportion of current VHB service users indicated they would consider switching to a lower specification service (for example, by reducing bandwidth or number of lines) in response to a SSNIP. As those users who recalled migrating cited changes in price as an important factor in the decision to migrate, it is perhaps unsurprising that an

[29] T9/736.

> increase in the higher bandwidth service might then trigger switching back to a lower bandwidth service. The same survey showed a high degree of similarity in usage of 1Gbit/s and VHB services, suggesting the potential for functional substitutability in both directions. These pieces of evidence suggest the potential for demand-side switching down the bandwidth chain, as well as up."

246. In our view the BDRC survey provided scant support for the contention that existing users of 10G would switch down in response to a 10G SSNIP. Although Ofcom referred to "[a] material proportion of current VHB service" users indicating that they would consider switching down in response to price rises at 10G, this was in fact a reference to a sample of just 9 users of 10G leased lines and 44 users of WDM services. Little weight can be attached to this finding, especially since it was not supported by factual evidence in the appeal proceedings.

247. The third sentence of FS 4.139 refers to changes in price as an important factor in a decision to migrate *upward*. However, this obviously reveals nothing about the role changes in price might play in decision to migrate *downward* once a user has already incurred costs of upgrading its systems and has been benefiting from use of the greater bandwidth. The fourth sentence notes that functional substitutability exists, but this takes Ofcom little further on the question of the effect of a SSNIP at 10G.

248. Overall, therefore, we do not find any error on the part of Ofcom in considering that 1G users exhibit a degree of price sensitivity as regards an upgrade to a 10G service. We do not, however, find any support for the proposition that many 10G users would consider switching down to a 1G service in response to a 10G SSNIP.

(7) Issue 2.3 and 3.3: the narrowing of price differentials

(a) TCO analysis

249. BT relied on a TCO analysis carried out by Dr Yardley to show that, assuming demand for bandwidth is a static given (*i.e.* bandwidth demand does not vary according to price) there would be no switching in response to a SSNIP by

profit-maximising users with a demand less than 1G. The figures relied on in Dr Yardley's second report turned out to be incorrect, but agreed corrected figures were set out in table 3 of Ms Curry's first report.

250. Dr Yardley's TCO analysis compared the costs of owning one or more 1G circuits against the cost of a 10G circuit and examined how those costs change as a result of a SSNIP at 1G or 10G. The analysis was based on specific assumptions, namely a customer lifetime of three years with a demand for a 10km link. The analysis varied depending upon whether or not the user in question had an existing 1G connection, since new 1G users must pay a connection charge in addition to rental charges. It also relied on BT's charges prior to the FS (rather than those of other providers which may differ) and assumed these were competitive.[30] The analysis also ignored other costs which might be specific to individual users which may have an impact on the total cost. The TCO analysis must therefore be treated with some caution.

251. Table 3 of Ms Curry's first report is dense and unintuitive, and we have therefore unpacked it into Table 3 to Table 6 below. We have also included additional rows to indicate in percentage terms how much more expensive (or cheaper) a 10G circuit would be compared to the alternative of one or more 1G circuits both before and after the SSNIP. Cells highlighted orange are those where the cheapest option changes following a SSNIP.

252. Table 3 and Table 4 consider the position before and after a 1G SSNIP:

Table 3: TCO for new customers, 1G SSNIP

Bandwidth demand	**1G**	**2G**	**3G**
Cost of 1G	£25860	£51720	£77580
Cost of 1G post SSNIP	£28446	£56892	£85338
Cost of 10G	£48660	£48660	£48660
How much more expensive (or cheaper) is a 10G connection pre 1G SSNIP?	88%	(-6%)	(-37%)
How much more expensive (or cheaper) is a 10G connection post 1G SSNIP?	71%	(-14%)	(-43%)

[30] BT's charges are: £23,760 for three years' rental for each 1G link and £42,660 for a 10G link and a connection charge of £2,100 for each 1G link and £6,000 for a 10G link.

Table 4: TCO for existing 1G customers, 1G SSNIP

Bandwidth demand	**1G**	**2G**	**3G**
Cost of 1G	£23760	£47520	£71280
Cost of 1G post SSNIP	£26136	£52272	£78408
Cost of 10G	£48660	£48660	£48660
How much more expensive (or cheaper) is a 10G connection pre 1G SSNIP?	105%	**2%**	(-32%)
How much more expensive (or cheaper) is a 10G connection post 1G SSNIP?	86%	**(-7%)**	(-38%)

253. Table 3 and Table 4 reveal that existing users with demand between 1 and 2G will find it 7% cheaper to purchase a single 10G circuit following a 1G SSNIP whereas before the SSNIP, a 10G circuit would be 2% more expensive. For new sites it will already be 6% cheaper for a user with demand between 1 and 2G to take a 10G circuit rather than 2x1G circuits; this increases to 14% following a SSNIP.

254. Table 5 and Table 6 consider the position before and after a 10G SSNIP:

Table 5: TCO for new customers, 10G SSNIP

Bandwidth demand	**1G**	**2G**	**3G**
Cost of 1G	£25860	£51720	£77580
Cost of 10G	£48660	£48660	£48660
Cost of 10G post SSNIP	£53526	£53526	£53526
How much more expensive (or cheaper) is a 10G connection pre 10G SSNIP?	88%	**(-6%)**	(-37%)
How much more expensive (or cheaper) is a 10G connection post 10G SSNIP?	107%	**3%**	(-31%)

Table 6: TCO for existing customers, 10G SSNIP

Bandwidth demand	**1G**	**2G**	**3G**
Cost of 1G	£23760	£47520	£71280
Cost of 10G	£48660	£48660	£48660
Cost of 10G post SSNIP	£53526	£53526	£53526
How much more expensive (or cheaper) is a 10G connection pre 10G SSNIP?	105%	2%	(-32%)
How much more expensive (or cheaper) is a 10G connection post 10G SSNIP?	125%	13%	(-25%)

255. Table 5 and Table 6 reveal that a new user with demand between 1 and 2G will find it 6% cheaper to purchase a 10G circuit before a 10G SSNIP, but will find a 10G connection 3% more expensive than 2x1G circuits following the SSNIP. For existing customers, it will already be cheaper for a user with demand between 1 and 2G to take 2x1G circuits rather than a 10G circuit, although the differential grows from 2% to 13%.

256. The tables indicate that in all cases, the cost of a single 1G circuit is cheaper than a 10G circuit both before and after a SSNIP at either 1G or 10G: and that in all cases, the cost of 3x1G circuits is more expensive than a 10G circuit both before and after a SSNIP at 1G and 10G.

257. From the above TCO analysis, it is apparent that the price differential between 1G and 10G circuits means that the decision for some customers as to which service to take has become "finely balanced". The Tables illustrate the fact – which was common ground between the parties in argument – that the critical cohort of marginal users for any SSNIP analysis are those users of leased lines either already at or envisaging demand between 1G and 2G.

258. On the other hand, we consider that the TCO analysis provides very little support for the proposition that the impact of a SSNIP at 1G is likely to have any significant effect upon new or existing users with demand not approaching the limit of the 1G service. Simply on the basis of the TCO, most users in that situation would be very unlikely to opt for the 10G service, which would be much more expensive both before and after a SSNIP at 1G. So, for example, a new customer would have to pay 88% more for a 10G line rather

than a 1G line before a SSNIP at 1G, and would still have to pay 71% more for a 10G line than a 1G line after a SSNIP at 1G. If such customers would not naturally choose to pay significantly more for the 'nice to have' extra bandwidth that they would not absolutely need, it is unrealistic to assume that more than a very small fraction would do so in response to a SSNIP at 1G.

(b) Evidence regarding a CP's pricing of its WDM products

259. In the FS Ofcom found that there was evidence that VM was offering its 1G WDM product at a price which "spanned the gap" between BT's 1G EAD and 10G EAD services. This was said to be a "key part" of Ofcom's evidence for its conclusion that there "is no clear break in the pricing schedule between high bandwidth and WDM products on the one hand and single service lower bandwidth Ethernet products on the other" (FS 4.202). This, it was argued, indicated that a SSNIP at 1G would result in "a material amount of switching from 1Gbit/s Ethernet to 1Gbit/s WDM" (FS 4.206).

260. In the course of the appeal proceedings it emerged that in the one instance where VM had provided the 1G WDM product to a customer at this low price, the customer had not in fact asked to be supplied with a WDM product nor had it been aware that it was receiving a WDM service. What in fact occurred was that the customer had sought an Ethernet service but, for internal reasons relating to location of the customer and VM's network infrastructure, VM had found that the most cost-effective way to provide that service was to use a WDM bearer, but to charge the customer as if it had been provided with an Ethernet service.[31]

261. The evidence also showed that VM does not market 1G WDM as a substitute for 1G Ethernet, and, it must be supposed, the relevant customer would not have received the 1G WDM service but for the peculiarities relating to its

[31] Ofcom had believed that the customer had knowingly purchased a 1G WDM service because it had been identified as receiving such a service in VM's response to a data request concerning the services it provides.

specific circumstances which meant it was actually cheaper for VM to provide a WDM service instead of a Ethernet service. […][✂][32]

262. The price at which VM's 1G WDM service was available was also the subject of considerable dispute. In the course of the consultation process, VM had provided to Ofcom figures for "a typical example" of what it might charge for point-to-point Ethernet and WDM services at both 1G and 10G, with prices split between installation and annual rental costs. Ofcom found that the VM's "typical" price fell between BT's list prices for its 1G EAD and 10G EAD services for services of a three year duration over a 10km link. […][✂][33] We were therefore not in a position to be able to reach a view on the actual price of this 1G WDM service.

263. In our view, it has been shown that Ofcom erred in concluding that the evidence established that VM's price for its 1G WDM service "spanned the gap" between 1G and 10G services. Whilst the actual price of VM's 1G WDM service is unclear, we do not consider that there is evidence that the service "competes" with 1G Ethernet services given: (i) it is not marketed as a rival service to 1G Ethernet; and (ii) there is only one instance, with peculiar circumstances, where the service has been used in preference to a 1G Ethernet service.

[32] Higgins 2, §10.
[33] Higgins 1, §5.36(a)(ii), T7P/68, 71-72.

(8) Evidence indicating significant numbers of 1G users with ~2G of demand

(a) Evidence before Ofcom when it prepared the FS

264. When conducting the HMT it is important to identify the "marginal" customers i.e. those customers who are most likely to switch in response to a SSNIP. The OFT Guidance recognise at footnote 19 that "[w]here a relatively high proportion of marginal customers purchase a product, a sustained 5 to 10 per cent price rise above competitive levels is less likely to be profitable."

265. In the context of the 1G SSNIP Ofcom identified two categories of marginal 1G user:

(1) those whose current demand exceeds 1G: and

(2) those whose demands does not currently exceed 1G, but (at the right price) might come to do so either immediately or in the near future.

These two categories are also supported by the evidence which we have discussed above in relation to the TCO analysis. In the categorisation used by Ms. Curry set out at paragraph 186 above, the first tranche of users fall within her para 60 (b) and the second tranche fall within her paras 60(a) and (c) to (f).

266. BT commissioned Analysys Mason to prepare a report (the "**AM 2015 Report**") which it submitted together with its response to Ofcom's consultation for the BCMR 2016. The report stated that "very few customers use multiple 1Gbit/s links on the same route in place of a single 10Gbit/s link once their bandwidth requirement increases above 1Gbit/s". The report also contained a chart purporting to support this contention which gave a figure concerning demand for 1G and multiple 1G circuits.

267. Crucially, however, it was unclear whether the figures in the chart related to the total *number of lines* purchased by users with multiple 1G demand or the

number of users purchasing multiple lines. Ofcom therefore emailed BT on 16 February 2016 to request clarification. The email asked:

> "Figure 1.3 shows that there are [*x*] [✂] 1xEAD1000 links, [*y*] [✂] 2xEAD1000 and [*z*] [✂] 3xEAD1000.
>
> Is [*y*] [✂] the number of consumers that have 2xEAD1000 links so therefore the total number of EAD1000 links for these consumers will be [2**y*][✂]? Does the same apply for the 3xEAD1000 consumers so that there is a total of [3*z] [✂] EAD1000 links for this group?"

268. The response from BT was given on 18 February 2016, and stated:

> "We can confirm that the data do indeed relate to customers as you indicated and are of June 2015 (we believe – the Analysys Mason analyst is away at the moment). The number of links are therefore multiples as you suggest.
>
> As a point of information, not shown on the Figure 1.3 are additional customers who have more than 3 1G circuits and there are at least another […][✂] 'customers' with at least 4*1GBit/s links."

269. The consequence of this information was that Ofcom was given to understand by BT that ignoring the users with 4 or more 1G circuits (who it can be presumed would have had an operational need for multiple circuits) about 20% of the total number of existing 1G circuits were taken by users with 2x1G or 3x1G circuits (i.e. […][✂]). Even if limited to 2x1G circuits, the proportion was about 17%. If translated into a 1G SSNIP test, and utilising the TCO figures referred to above, this would have meant that there was a very significant proportion of the hypothetical monopolist's 1G circuits which would have been potentially affected by a SSNIP at 1G.

(b) Evidence in the appeal proceedings

270. It is highly regrettable that it transpires that BT's response to Ofcom's query was wrong. It turns out that the 20% figure is a significant overstatement of the true level of demand for multiple 1G circuits from BT. After the Final Statement had been issued, it was revealed by BT that the figures given did not relate to the number of users of multiple 1G circuits, but the number of postcodes at which 1G circuits terminated: Analysys Mason had used postcodes as a rough proxy for actual customers. As such, if more than one circuit terminated at the same postcode, that would have been counted by

Analysys Mason as a customer taking multiple 1G circuits. However, as Mr Logan explained, the use of postcodes in this way was a very crude measure, since multiple businesses each only taking a single 1G circuit might very well share a postcode (Mr. Logan gave the example of multiple businesses based at The Shard in London sharing the same postcode). Thus, Mr. Logan explained, the Analysys Mason numbers were likely substantially to have overstated the true number of marginal customers using multiple circuits and hence overstated the volume of 1G circuits which would be sensitive to a SSNIP at 1G.

271. Mr Logan prepared revised figures based on a business-by-business count. He also excluded users purchasing BT's specific resilience products (RO1 and RO2) on the basis that these customers would be unlikely to be 'marginal' for the purposes of a SSNIP, since they had made a conscious decision to purchase multiple 1G circuits specifically for resilience. On this basis, Mr Logan reached the conclusion that the true figure for multiple 1G circuits was much less than half the 20% figure, at [*0 - 9%*] [✂]. Mr Logan frankly accepted that this figure might not be perfectly accurate, but he suggested that it was the best estimate of the true number of multiple 1G circuits that it was possible to achieve.[34]

(c) Analysis

272. There was some debate as to whether the [*0 - 9%*] [✂] figure ought to be adjusted either upward or downward. On the one hand some resilience customers might still be relatively 'marginal' and will have wrongly been excluded from this figure. On the other hand, some users included within this figure are purchasing 3x1G and 4x1G circuits and, if they were price sensitive, could be expected already to have switched to a single 10G circuit to save money even without a 1G SSNIP (see the "3x1G" column of Table 4 at paragraph 252 above). We also recognise that these figures relate only to BT's customers. However, we have had no evidence to suggest that the figures would be markedly different for other CPs.

[34] T6P/168.

273. On the basis of the limited evidence that we heard, we do not consider ourselves in a position to adjust the [*0 - 9%*] [✂] figure either upward or downward. We therefore accept this figure as the most accurate estimate of the number of 'marginal' users of 1G services. However, we acknowledge that the figure must be treated as an estimate with an associated margin of error.

274. We return to consider the significance of this evidence below.

(9) Issue 2.2 and 3.2: evidence of migration trends and the potential for acceleration, delays or changes to plans regarding upward migration

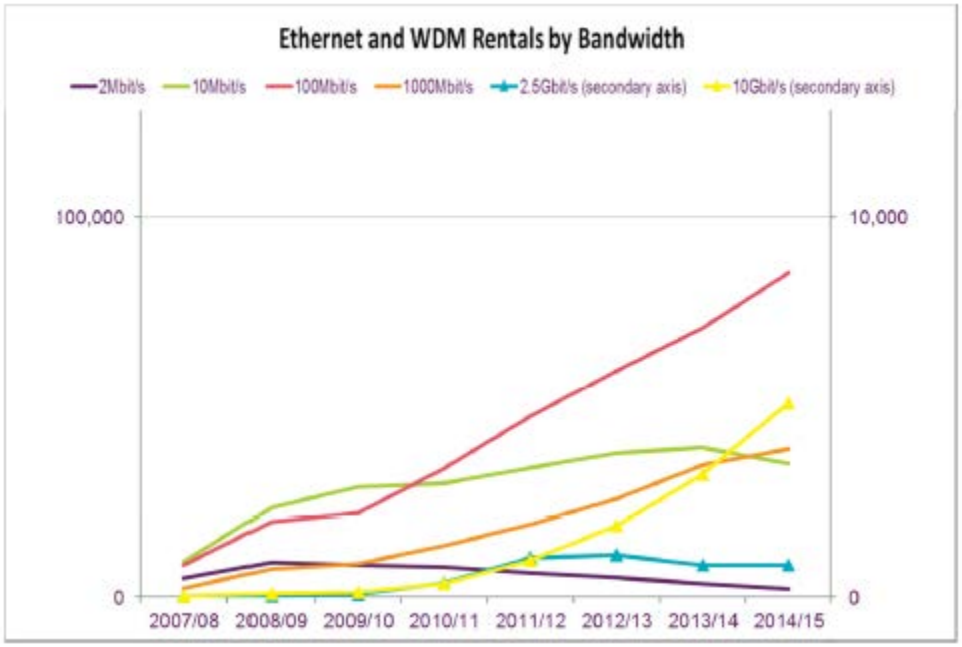
(a) Evidence

275. All parties agreed that over the course of the review period there will be migration from 1G to VHB. A matter of dispute was the likely scale of this migration. In the FS Ofcom concluded that a "material proportion" of lower bandwidth users would be likely "to consider upgrading to VHB services over this review period" (FS 4.138). BT and VM argued that Ofcom had materially overstated the likely level of upward migration. BT argued that the figure would be in the region of the […]% [✂] figure found in its pricing documents.

276. The FS contains at Figure 3.10 (reproduced in Figure 4 below) forecast figures prepared by BT for the purpose of the leased line charge control (**"LLCC"**), these indicate that very significant growth will occur.

Figure 4: Growth of Ethernet and WDM services (FS Fig 3.10)

[*Confidential table redacted, non-confidential version set out below*] [✂]



277. With regards to the business access segment, the BDRC Survey indicates that 8% of respondents with demand between 100M and 1G are "very likely" to upgrade to 10G and a further 19% are "likely" to upgrade in the next three years (Fig 45). Even taking into account possible bias of respondents overstating their actual likelihood of upgrading, this evidence is consistent with the potential for significant migration to VHB. This evidence was also supported by the oral and written evidence of Messrs Allinson, Lane and Pilsbury of the CP Group to the effect that enterprise customers are increasingly requiring VHB circuits. Messrs Pilsbury and Baxter also provided convincing evidence that demand in the MNO and LLU backhaul segments is also anticipated to increase substantially over the coming years.

278. Mr Logan and VM's Mr Higgins sought to downplay the scale of the likely migration, but their evidence was successfully undermined in cross-examination. In summary:

(1) Mr Logan's evidence concerning expected growth rates of VHB was that […][✂]. He prepared a chart in support of this point (Figure 7 of Logan 1) but was unable to explain convincingly the assumptions underlying it. The chart's contents also appeared to be inconsistent with a table he had prepared in a subsequent witness statement (Table 4 of Logan 2).

(2) Mr Higgins accepted in his evidence that there was a "general upward migration" reflecting what was in his view a "gradual upwards trend in bandwidth requirements."[35] He went on to estimate how many of VM's installed circuits changed bandwidth between 2013 and 2016, preparing a chart covering VM's entire installed base of circuits from 10M to 1G. Mr Higgins stated that the migration from 100M to 1G was "very small indeed".[36] However, Mr Higgins' figures were so small that we have no confidence in them. If accurate, the figures would indicate that there has also been almost no migration at <u>any</u> level of bandwidth (i.e. from 10M to 100M, or from 100M to 1G) which is inconsistent with the evidence of a general upward trend.

(b) Analysis

279. We consider that there is ample evidence to support Ofcom's finding that there will be significant migration to VHB during the course of the review period. We find no error in relation to this aspect of the FS.

[35] Higgins 1, §6.3(b).
[36] Higgins 3, §14.

(10) Issues 2.4 and 3.4: switching costs

280. In the FS Ofcom concluded that switching costs would be "unlikely to present a material barrier to migration from 1Gbit/s to VHB services in response to any SSNIP" (FS 4.216). Ofcom relied on two main sources of evidence to support this contention:

(1) The BDRC Survey. The survey evidence indicated that, of those respondents who had migrated, less than half reported experiencing an obstacle whilst migrating. Of those, 46% indicated that there was no additional cost and 10% did not know; 27% experienced costs below £10,000 and 17% experienced costs above this figure.

(2) Pricing discussions with two CPs (summarised at FS 4.99). These discussions indicated that, compared to switching bandwidths up to 1G, the switching costs associated with a shift from 1G to VHB were higher in absolute terms, but similar as a proportion of prices. The discussions also indicated that switching costs do not significantly affect customers' decision to migrate.

281. Ofcom also considered that even where switching costs exist, these costs are less likely to impact the switching decision given demand for bandwidth is continually increasing and migration may occur at some point anyway (FS 4.214).

282. The issue of switching costs was analysed in significantly greater detail during the appeal proceedings. These costs can be placed into three main groups:

(1) Costs relating to the equipment used by the supplier;

(2) Suppliers' core network costs;

(3) Customers' own equipment costs.

283. The Group 1 costs (suppliers' equipment costs) will be factored into the price at which 10G services are available since the supplier will need to recoup those costs over the lifetime of the relevant contract. We have already analysed this category of cost in section F(7)(a) (Dr Yardley's TCO analysis), we therefore do not propose to consider them further.

284. The Group 2 costs (suppliers' core network costs) concern the costs which CPs incur in putting in place infrastructure to be able to offer VHB services to business users and/or to use VHB circuits for backhaul. It is not the case that CPs' networks are "10G ready" across all locations. To be able to offer 10G services (or use 10G circuits for backhaul), CPs need to upgrade their core networks. BT argued that, for a 1G SSNIP to be defeated, the costs of these upgrades would need to be brought forward and that Ofcom erred because it had not calculated or assessed these costs in the FS. The evidence of the CP Group witnesses was, however, that CPs' networks were ready to gear up if necessary, at least in relation to a substantial proportion of their sites.[37] These costs are planned a long time in advance and then spread across a large category of end-users, we therefore do not consider that they would create a meaningful barrier to switching.

285. The Group 3 costs (customers' own equipment costs) concern the costs which users might incur in upgrading their internal systems in order to make use of the 10G equipment. Here, Ofcom relied upon the BDRC Survey evidence to suggest that such costs are likely to be minimal. There are, however, two key difficulties with this approach. First, the BDRC Survey figures quoted at paragraph 280(1) relating to the level of costs incurred relate to migration from all bandwidths, not migration to VHB with which we are particularly concerned.[38] Second, the survey results relied upon related to users who migrated and therefore (by definition) were not put off by the switching costs connected with migration. The survey therefore cannot present a complete picture of the impact of switching costs on users' behaviour. To address this gap Ofcom also relied upon its pricing discussions with CPs (referred to

[37] Mr Connors of Vodafone: T8/680-681. Mr Pilsbury of TalkTalk: T8P/38-40.
[38] See Fig 33 of the BDRC Survey.

above) and highlighted that a user with demand between 1 and 2G would need to incur costs if it were to purchase 2x1G circuits meaning that the true cost of migration would be the difference between these two figures only. Our view is this is an aspect where some doubt persists and further analysis may have been helpful. However, BT has not adduced evidence to suggest that this is a real rather than a merely theoretical concern. In those circumstances we are not persuaded that Ofcom has erred in relation to its assessment of this category of switching costs.

286. Overall, we consider that whilst the analysis of switching costs in the FS was somewhat superficial, we are not persuaded that Ofcom erred in reaching the conclusion that switching costs would not represent a material barrier to upwards migration.

(11) Issue 2: whether Ofcom erred in its conclusion that a SSNIP for 1G Ethernet would be rendered unprofitable by a sufficient demand-side response.

287. Under issue 2 we must consider whether Ofcom erred in its 1G SSNIP analysis. As noted in relation to issue 1 above, we have found that *in principle*, the use of qualitative evidence alone can provide a sufficient basis for a SSNIP analysis. The question is whether or not we consider, *on the facts of this appeal*, Ofcom's 1G SSNIP analysis was wrong.

288. BT has demonstrated two important factual errors in Ofcom's assessment and analysis of the materials relied on in the FS:

(1) First, and most importantly, we do not agree that BT's internal documents reveal strong pricing interactions or pricing interdependence between its 1G and 10G services: nor do we consider Ofcom's pricing discussions with CPs support this contention (see sections F(4) and F(5) above). Given this material was relied upon by Ofcom as the "most compelling" evidence, Ofcom's implicit

conclusion that a 1G SSNIP would be unprofitable[39] is thrown into considerable doubt.

(2) Second, Ofcom's reliance on the VM's pricing of its 1G WDM service as evidence that there are services which "span the gap" between 1G and 10G has proven to be unsound.

289. On the other hand, we consider BT has not shown that Ofcom erred in finding that:

(1) users of 1G lines exhibit a material (albeit not a high) degree of price sensitivity;

(2) users "at the margin" with demand currently at (or soon approaching) the limit of a single 1G circuit would have a "finely balanced" decision as regards migrating to VHB;

(3) users of 1G will migrate to VHB in substantial numbers during the review period; and

(4) users will not be materially deterred from upgrading to VHB by switching costs.

290. The errors in Ofcom's analysis identified in paragraph 288 above were clearly material. The question is whether, notwithstanding those errors, the remaining aspects of Ofcom's analysis are sufficient to support the decision. This throws into sharp relief the critical question on the HMT, namely whether a SSNIP at 1G would be unprofitable. That in turn will depend in particular upon the size of the cohort of 'marginal' 1G users and whether the evidence suggests that a sufficiently large portion of the 1G population is likely to switch as a result of a SSNIP at 1G such that it would render the SSNIP unprofitable.

[39] Although the Final Statement did not expressly state that the 1G SSNIP would be unprofitable, this finding is implied by Ofcom's conclusion that there was a single product market, The same applies for the 10G SSNIP. References hereafter to Ofcom having found that the 1G or 10G SSNIP were unprofitable are to this implied finding.

291. The closest that Ofcom came to this issue in the FS was in FS 4.164 in which Ofcom stated:

> "4.164 [The AM 2015 Report] suggests demand for multiple 1Gbit/s is a significant proportion of BT's 1Gbit/s EAD volumes (20%). If this demand were representative of the wider market, then in the context of the SSNIP test, 20% is a material proportion of links that are likely to be highly sensitive to small changes in relative prices of 1Gbit/s and 10Gbit/s services.

292. In cross-examination, Mr. Curry expanded upon this issue and indicated that although this was not referred to in the FS, Ofcom had in fact performed a rudimentary form of critical loss analysis, and on the basis of its understanding of BT's profit margins and the 20% figure for multiple 1G links supplied by BT, Ofcom had formed the view that a sufficiently large number of marginal users did exist, so that only a relatively low proportion of them would need to switch so as to render a 1G SSNIP unprofitable:

Q (Mr Beard)	So, what I am exploring is whether in that conceptual framework in the final statement you did or did not make an assessment of profitability. […] there is not [an assessment of profitability], is there?
A (Ms Curry)	Not directly, but, as I said earlier, and indeed Analysys Mason's own report shows, these users taking multiple 1G circuits would be particularly sensitive to a SSNIP. There appeared to be quite a large number of them and the migration figures suggest there could be more over the course of this review period. **It is never explicitly stated in the context of a SSNIP test, but it is fair to say that we had in the back of our minds when looking at these numbers that BT makes very high margins on these products.** [T]he incremental cost of providing these services is very low once you have a connection in place […]. **So, you would not need to see much more than 10% switching in response to a 10% SSNIP to render it unprofitable. So, when you see a number like 20% of current users maybe sitting in this very marginal bracket, well, that is significantly above the figure you would likely need to see switch and so it would affect the profitability of a SSNIP.** **[…]** Ofcom did not explicitly make the point about incremental costs being low and therefore the

> required degree of switching being low, but it was fully aware of that fact when it reached its decision.[40]
>
> (Emphasis added.)

293. The fundamental difficulty facing Ofcom, however, is that on the basis of the evidence presented on appeal by BT, it is now clear that the best estimate of the correct number of circuits leased by marginal customers is not 20%, but is far less than that, at [*0 - 9*]% [✂]. Accordingly, if one conducts a 'sense check' using the real percentage of marginal users, it immediately becomes apparent that even if BT had a gross margin of 100% (which it clearly does not) and even if the entire marginal population would switch in the event of a 1G SSNIP (which is implausible) there would still be a shortfall in the number of 'switchers' needed to render a 1G SSNIP unprofitable. Thus the SSNIP would only be unprofitable if a sufficient number of non-marginal users with demand less than 1G would also switch as a result of the 1G SSNIP. But there is no analysis by Ofcom as to what fraction of these non-marginal users would switch in response to a 1G SSNIP, and the TCO analysis indicates that the fraction would be likely to be very small (see paragraph 258 above).

294. As such, in our view, using the best estimate of marginal customers and taking into account the other errors in Ofcom's assessment noted at paragraph 288 above, it becomes clear that Ofcom's overall assessment that a 1G SSNIP would be unprofitable cannot stand.

295. That said, we do not consider that BT has satisfied us of the contrary proposition that a 1G SSNIP would be profitable. The evidence of Mr. Logan to which we have referred regarding the marginal cohort was, as we have noted at paragraph 273 above, subject to some caveats and had not been the subject of a full analysis and investigation by Ofcom. Moreover, because the erroneous 20% figure led Ofcom to conclude that on any realistic view of BT's gross margins, the relevant critical loss figure would easily be surpassed, it appears that Ofcom did not consider it necessary to perform a more granular SSNIP analysis or a critical loss analysis. Nor did Ofcom consider in any

[40] T12/pp1064-1068.

detail the reactions of the large number of users with demand less than 1G. The number of these non-marginal users is very large. Whilst one would not expect many non-marginal users to switch to 10G in response to a 1G SSNIP, it is at least possible that a fraction of them might be motivated to do so if they felt able to take advantage of the 'nice to have' capacity of a 10G connection.

296. We therefore cannot eliminate the possibility that upon further investigation and analysis Ofcom might legitimately be able to conclude that a 1G SSNIP would be unprofitable. For that reason we consider that the appropriate course is to quash Ofcom's decision insofar as it relates to Ofcom's finding that a 1G SSNIP would be unprofitable and remit the matter to Ofcom for further investigation.

297. We would note that, given the context of substantial upward migration, Ofcom's further analysis will require a more careful consideration of the appropriate timeframe of the SSNIP, since the duration of the SSNIP may affect the level of demand for capacity of users and hence their price-sensitivity. This is a subject we discuss further in the following section.

(12) Issue 3: whether Ofcom erred in its conclusion that a SSNIP for 10G Ethernet would be rendered unprofitable by a sufficient demand-side response?

(a) Analysis

298. Under issue 3 we must consider whether Ofcom erred in its 10G SSNIP analysis.

299. In the FS, Ofcom relied upon a view, based largely on the BDRC survey, that there were reasons to believe that switching of existing customers in response to a SSNIP would not simply be by way of existing 1G customers upgrading to a 10G service, but could be by existing 10G customers switching down to multiple 1G circuits in response to a SSNIP at 10G: see e.g. FS4.139 and 4.167. We have already commented at paragraph 246 that we do not think that the BDRC survey provided any reliable evidence to that effect, and on the appeal, Ofcom realistically recognised that instances of existing 10G users "switching down" to 1G would be rare even if faced with a SSNIP at 10G (see paragraph 187 above). To that extent we consider that Ofcom erred in its analysis of a 10G SSNIP.

300. However, in these appeal proceedings Ofcom relied on evidence and argument that sufficient numbers of anticipated new users, due to start using 10G in the relevant period, would refrain from doing so if faced by an increase in the price of a 10G service so as to render a 10G SSNIP unprofitable. Ofcom contended that this provided an alternative basis for upholding its finding in relation to the 10G SSNIP.

301. This suggested basis for supporting the 10G SSNIP raises three important questions of principle:

(1) What is the appropriate timeframe for the 10G SSNIP? The longer the duration of the SSNIP, the more "switching" to 10G is likely to occur as a matter of course.

(2) How should the Tribunal evaluate losses to the hypothetical monopolist with an 'inter-temporal' element? For example, if an existing 1G user delays a planned upgrade to 10G in response to a 10G SSNIP, is the lost revenue during the period of delay to be treated as a total loss to the monopolist or merely as delayed income (i.e. a loss of the time value of money)?

(3) What level of 'diversion' of anticipated new users would be necessary to render a 10G SSNIP unprofitable in a scenario where few (if any) existing users of 10G are anticipated to switch in response to a SSNIP? As we are not dealing with switching by existing users, the set of critical loss factors at Table 2 (at paragraph 164 above) is not relevant to the 10G analysis.

302. Unfortunately, the analysis of the 10G SSNIP in the Final Statement was exceedingly brief. The three questions mentioned in the preceding paragraph were not identified, let alone discussed or answered. In particular, there was no analysis in the FS, or evidence in the subsequent appeal proceedings, as to what proportion of the anticipated new users might be expected to refrain from purchasing 10G services in the face of a SSNIP at 10G. Nor did the FS or Ofcom's Defence address the timeframe for the 10G SSNIP. These matters first featured in BT's reply and later in the parties' skeleton arguments and the hearing itself.

303. Importantly, at no point in the proceedings was there any discussion of the diversion rates of anticipated new users that would be necessary to render a 10G SSNIP unprofitable. During the closing submissions Professor Cubbin invited Ofcom's counsel, Mr Holmes, to provide the Tribunal with a plausible scenario in which the number of new 10G users who could be anticipated would be lost was such that a 10G SSNIP would be unprofitable. Mr Holmes declined to provide such a scenario.[41] Moreover, whilst it would clearly have been possible for Ofcom to have created a table of critical loss factors equivalent to that at Table 2, Ofcom did not do so. We are therefore not in a

[41] T16/1648-1649.

position to conduct even a rudimentary 'sense check' of Ofcom's case of the type described by Ms Curry at paragraph 292 above.

304. In summary, Ofcom's reasoning in the FS regarding the 10G SSNIP has been shown to be materially flawed both in relation to downward migration and as to its assessment of BT's internal documents and stakeholder responses. Ofcom was also not able to reassure the Tribunal that even a single plausible scenario exists where a 10G SSNIP would be unprofitable. In those circumstances, we do not consider that Ofcom's conclusion that a 10G SSNIP would be unprofitable can stand.

305. Again, however, BT has not persuaded us that a 10G SSNIP would be profitable and we cannot eliminate the possibility that upon further investigation and analysis Ofcom may be able to conclude that a 10G SSNIP would be unprofitable. For that reason we will quash Ofcom's decision insofar as it relates to Ofcom's finding that a 10G SSNIP would be unprofitable and remit the matter to Ofcom for further investigation.

(b) Comments regarding the 10G SSNIP

306. While it is not strictly necessary for us to consider the various arguments raised in relation to how a 10G SSNIP would be carried out, as the matter is being remitted to Ofcom for reconsideration, we consider it appropriate to set out our tentative conclusions on two related issues that were debated before us.

Timeframe for the 10G SSNIP

307. The Notice on Market Definition is silent on the exact time horizon of a SSNIP, merely stating that additional products should be included if they would restrain sufficiently the pricing "in the short term" (para 16).

308. The OFT Guidance state the following:

> "3.6 The important issue is whether the undertaking could **sustain** prices sufficiently above competitive levels. Customers may take time to respond to a sustained rise in the price of the focal product. As a rough rule of thumb, if

> substitution would take longer than one year, the products to which customers eventually switched would not be included in the same market as the focal product. Products to which customers would switch within a year without incurring significant switching costs are more likely to be included in the relevant market. However, the relevant time period in which to assess switching behaviour may be significantly shorter than one year: for example, in industries where transactions are made very frequently. A case by case analysis of switching is therefore appropriate."
>
> (Emphasis in the original. Footnote omitted.)

309. *Bishop & Walker* provides a useful discussion of the timeframe over which to assess a SSNIP, and highlights that a two-year approach is adopted in the American regulatory guidance in merger cases (p. 136):

> "The DoJ/FTC guidelines refer to a two-year period over which substitution responses take place. A period of at least one year would appear to be appropriate since we are interested in the responses of customers and suppliers to a permanent change in relative prices; to adopt a short time frame over which substitution can occur would lead to important competitive constraints that affect competitive outcomes being ignored. Surprisingly, the Relevant Market Notice is silent on this question and this has led in practice to an implicit very short time period being considered, which has led to a bias towards defining relevant markets narrowly."

310. In her evidence, Ms Curry initially indicated that a three year time horizon might be appropriate for a SSNIP because Ofcom had to adopt a market definition relevant for the whole review period. However, when questioned by Professor Cubbin, she retreated from this position and stated that the real question was whether substitution would be "sufficiently timely" so as to affect the pricing decision of the hypothetical monopolist (see the transcript excerpt at paragraph 98 above). In our view, this latter question is obviously the correct focus of the SSNIP analysis. The frequency of Ofcom's review cycle has no bearing on the duration of the SSNIP.

311. However, we do accept that if a duration is selected for the SSNIP which is shorter than the review period, then Ofcom will need to consider whether its SSNIP assessment might change during the course of the review period. As the SMP Guidelines put it:

> 20. In carrying out the market analysis under the terms of Article 16 of the framework Directive, NRAs will conduct a forward looking, structural evaluation of the relevant market, based on existing market conditions. NRAs should determine whether the market is prospectively competitive, and thus whether any lack of effective competition is durable, by taking into account

> expected or foreseeable market developments over the course of a reasonable period. The actual period used should reflect the specific characteristics of the market and the expected timing for the next review of the relevant market by the NRA. NRAs should take past data into account in their analysis when such data are relevant to the developments in that market in the foreseeable future.

312. We had relatively little detailed evidence before us as to the duration and frequency of renewal or change of leased line contracts by customers. We were, however, told in general terms that users of leased lines tend to purchase services and equipment in either yearly or six-monthly procurement rounds and that many larger organisations have a rolling five year plan regarding their future needs. In addition, we were told that the vast majority of leased line contracts are of either a 1 year duration or 5 year duration and that, in general terms, users taking one-year contracts are typically expected by CPs to have a three year customer 'life'.

313. This type of evidence appears to us highly relevant as regards the appropriate duration of a SSNIP analysis at 10G since it is these characteristics which will affect the modelling of the effects of a SSNIP and whether a hypothetical monopolist at 10G will be able to 'sustain' a 10% price rise.

314. However, given the relatively imprecise evidence which we received on the point, beyond indicating that we think that the duration of the SSNIP should not be less than a year, we do not consider that we are in a position to determine the appropriate duration of the SSNIP.

315. Correctly identifying the time-frame of the SSNIP is also relevant because of Ofcom's reliance on the impact of delayed migration for the 10G SSNIP. The evidence was that given the general trend towards higher bandwidths, the '10G population' is anticipated to grow very substantially during the course of the BCMR period. The longer the time frame chosen for the SSNIP, the greater the pressure upon potential users of 10G to migrate. That is the next issue to which we turn.

The hypothetical monopolist's response to delayed migration

316. None of the guidance documents consider the scenario where a SSNIP is said to be unprofitable owing to a delay in the arrival of new customers for the focal product (as opposed to the loss of existing customers). The issue is how the hypothetical monopolist should be taken to view the revenue "lost" by the non-receipt of income during the period of delay in migration to the 10G service in comparison to the counterfactual where there is no SSNIP.

317. Dr Yardley suggested that all such losses should simply be treated as the loss of the time value of money. He suggested that the hypothetical monopolist at 10G will receive the revenue eventually when the marginal customer at 1G finally trades up, so his only loss is not having the revenue immediately available.

318. In contrast Ms Curry considered that revenue received outside the timeframe of the SSNIP, at the tail end of a contract whose onset was delayed as a result of the SSNIP, should be disregarded; and hence the revenue not received during the period of delay should be treated as completely lost:

> "[Y]ou are comparing revenues of the hypothetical monopolist both with and without a SSNIP over the relevant timeframe. […] So, if you are limiting it to a one-year, two-year, three-year period, then revenues accrued in [the] post-SSNIP scenario are not relevant to that test, they are not part of the equation." [42]

319. We are inclined to agree with BT that the hypothetical monopolist implementing a SSNIP at 10G would look to compare the present-day value of the asset which he would obtain by his contract with a marginal customer in two scenarios: (i) where there is no SSNIP and the anticipated customers for the 10G service all duly take up their contracts; and (ii) where there is a SSNIP at 10G and a proportion of the marginal customers either delay taking a 10G contract for another period of their existing contract at 1G, or decide to defer trading up indefinitely. The present value of an indefinitely deferred contract is zero; but in a case of delay rather than indefinite deferral, the hypothetical monopolist can be assured that the customer will sign up with him (because he

[42] T13/1201 and discussion at T13/1198-1203.

is the monopolist of the 10G market) after an extra contract period or periods at the lower bandwidth, and so he can calculate the present value of the income stream from the 10G contract which it is envisaged will be entered into at that date in the future.

320. So, for example, if a marginal 1G user would, in the ordinary course, have migrated to a 5 year contract for a 10G circuit at the end of year 1, paying £100 p.a., the hypothetical monopolist can calculate the present day value of that contract using an appropriate discount rate. He can also calculate, using the same discount rate, the present day value of the 5 year 10G contract for £110 p.a. which, in the counterfactual, it would be assumed that the same customer would sign at the end of year 2, having responded to a 10% SSNIP at 10G by staying with his existing provider at 1G for another year. We consider that the difference between the two is what the hypothetical monopolist at 10G would be likely to consider that he was losing as a result of the 10G SSNIP.

(13) Other matters: did Ofcom err in assessing the chain of substitution in the CISBO market?

321. BT made two further related arguments which we will briefly discuss, since it seems likely that these matters will need to be considered by Ofcom in the remittal:

(1) Ofcom erred by failing properly to test each link of the chain of substitution (aside from the 1G/10G link).

(2) Ofcom erred by failing to identify pricing interactions at the extremes of the chain of the same order of magnitude.

322. Before considering these arguments, we briefly discuss the concept of a chain of substitution.

(a) Chains of substitution

General discussion

323. Both the Notice on Market Definition and the SMP Guidelines discuss the concept of a "chain of substitution". The Notice states:

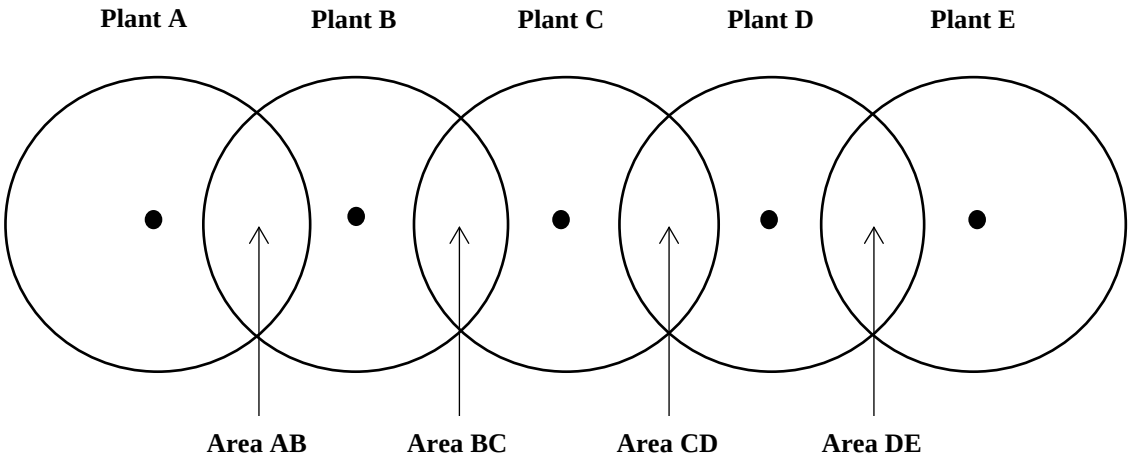
> "57. In certain cases, the existence of chains of substitution might lead to the definition of a relevant market where products or areas at the extreme of the market are not directly substitutable. An example might be provided by the geographic dimension of a product with significant transport costs. In such cases, deliveries from a given plant are limited to a certain area around each plant by the impact of transport costs. In principle, such an area could constitute the relevant geographic market. However, if the distribution of plants is such that there are considerable overlaps between the areas around different plants, it is possible that the pricing of those products will be constrained by a chain substitution transmission effect, and lead to the definition of a broader geographic market. The same reasoning may apply if product B is a demand substitute for products A and C. Even if products A and C are not direct demand substitutes, they might be found to be in the same relevant product market since their respective pricing might be constrained by substitution to B.

324. The SMP Guidelines refer to para 57 of the Notice on Market Definition and also discusses 'chains of substitutability':

> "62. In its Notice on market definition, the Commission drew attention to certain cases where the boundaries of the relevant market may be expanded to take into consideration products or geographical areas which, although not directly substitutable, should be included in the market definition because of so-called 'chain substitutability'. In essence, chain substitutability occurs where it can be demonstrated that although products A and C are not directly substitutable, product B is a substitute for both product A and product C and therefore products A and C may be in the same product market since their pricing might be constrained by the substitutability of product B. The same reasoning also applies for defining the geographic market. […]"

325. A chain of substitution will exist where there is an unbroken series of substitutes and each product in that series is constrained by its neighbouring products. A chain of substitution can be represented in diagrammatic form by imagining five factory plants 'A' to 'E' each serving neighbouring and overlapping geographic areas as set out below, where product 'A' is constrained by product 'B', product 'B' is constrained by products 'A' and 'C' and so on.

Figure 5: Diagram of a chain of substitution



326. The fact that there is a chain of substitution between products 'A' to 'E' does not necessarily mean there will be a single relevant market. This is because the SSNIP test seeks to define the "smallest" product group and geographical area in which a hypothetical monopolist could profitably sustain supra-competitive prices (see para 2.7 of the OFT Guidance quoted at paragraph 153

above). This point is discussed in the OFT Guidance (at footnote 41) and is explained in *Bishop & Walker*, box 4.4 at p.147:

> Assume that there are five firms, A, B, C, D, and E. Each currently sells 100 units at €1. Unit costs are €0.5 and there are no fixed costs, so each firm currently makes a profit of €50. If any firm raises its relative price by 10 per cent, it loses 10 per cent of its sales to each of its neighbours. So if firm C raised its price by 10 percent, its sales would fall to 80. Since its price would rise to €1.1, its revenues would fall to €88. Costs would fall to €40 and so its profits would fall to €48. Hence the price rise would not be profitable.
>
> Now suppose that firms B, C and D merge and the merged firm raises its prices by 10 per cent. B will lose 10 of its sales to A, but none to C as their relative prices have not changed. C will lose no sales as its price relative to B and D is unchanged. D will lose 10 sales to E, but none to C as its relative price has not changed. The end result is that the merged firm now sells 280 units at €1.1 rather than 300 at €1. Its revenues rise to €308, its costs fall to €140 and so its profits rise from €150 to €168. Hence BCD is a relevant market, despite the continuous chain of substitution from A to E."

327. In other words, if focal product is product 'C', the relevant market will be BCD, despite the existence of the chain of substitution from A to E. This is because products 'B' and 'D' would constrain a hypothetical monopolist of product 'C'. However, there is no relevant constraint exerted upon a hypothetical monopolist of product 'C' by products 'A' and 'E'. Taking market shares of products 'A' and 'E' into account when assessing the competitive constraints imposed upon a producer of product 'C' would distort the analysis – to do so may make it appear that the producer of product 'C' faces stronger constraints than it does in reality.

328. It is, however, possible to conceive of situations where a chain of products 'A' to 'E' will form a single relevant market together with product 'C'. This will be the case where there is what we will term as a "**chain substitution transmission effect**". This will be the case where non-substitutes impose a constraining effect on non-neighbouring products indirectly through the restraint they impose on the directly neighbouring products. For a set of products 'A' to 'C', a chain substitution transmission effect will exist between products 'C' and 'A':

(1) if a monopolist of 'C' would be constrained by substitution to 'B'; and

(2) if an monopolist of both 'C' and 'B' would also be constrained by substitution to 'A' even though it is only a substitute for product 'B'.

This will be the case where – even though customers of product 'C' have no choice but to pay the increased price – the hypothetical monopolist would lose money overall because so many customers would switch from product 'B' to 'A'. In this way the constraint is 'transmitted' across the chain from 'A' to 'C' even though no switching takes place between 'A' and 'C'. In this scenario it would be appropriate to consider market shares of product 'A', 'B' and 'C' when considering the competitive position of a seller of product 'C' since both products, 'A' and 'B', exert a constraint on a seller of 'C', albeit 'A' does so only indirectly. To fail to take account of product 'A' may make it appear that the seller of product 'C' faces weaker constraints than it does in reality.

329. Since the purpose of market definition is to make an assessment of market power, it may become relevant in that assessment how far the chain of substitution (and any transmission effect) extends. A broader market definition may mean that a putative dominant firm appears to have either more or less market power, depending, for instance, on its market share in the additional segments. However, the logic of the chain of substitution argument also suggests that, insofar as a single market with strong transmission effects has been established, market power can only be as strong as it is in the most competitive part of that chain.

(b) Did Ofcom err by failing to test all links in the chain?

330. From the discussion in the preceding section, it can be seen that – even where a chain of substitution is shown to exist – it cannot be assumed that there is a single relevant market spanning the entire chain.

331. The FS did not examine separately the links between below 1G or above 10G, but focussed instead on whether or not a 'break' existed between 1G and 10G. Ofcom argued that the nature of the exercise it was conducting meant that the issue of relevant markets within a wider chain of substitution was irrelevant.

Ofcom referred to footnote 41 of the OFT Guidance which expands upon the statement at para 5.10 of the OFT Guidance that "even if two products do not lie within the same market for the purposes of one investigation, this does not rule out the possibility that they will be in the same relevant market in another". Footnote 41 states:

> "For example, […] where products A to E [are] all substitutes for each other (to varying degrees) and where a hypothetical monopolist of three products next to each other in the chain could profitably sustain supra competitive prices. In this case, if the focal product is B alone, it is possible to define products A, B and C to be the relevant market. However, when investigating the conduct of an undertaking that supplies both products B and E, the appropriate frame of reference for the competitive assessment may include products A to E. […]"

332. Mr Holmes, for Ofcom, went on to submit that:

> "In this case, Ofcom was analysing the extent of the entire chain of substitution, it was not concerned solely with monopolisation of one focal product within it. It was not like a merger inquiry or a competition investigation where there say is a defined focal product specified by the nature of the task. And there we say Ofcom took the right approach by applying the hypothetical monopolist test in relation to the relevant links in the chain which were disputed, 1G and 10G.[43]

333. We consider Mr Holmes's suggestion that there is no 'focal product' in this market review to be misplaced. Ofcom is under an obligation to define relevant markets appropriate to national circumstances (Art 15(3) FD). This duty requires Ofcom to consider the circumstances as they currently are and are likely to develop during the review period. Although BT may be present across the spectrum of bandwidths, the question Ofcom must assess is whether BT (or any other entity) has SMP for services at any particular bandwidth of the market and to do that Ofcom needs to examine each product individually.

334. In this case Ofcom took account of BT's shares of non-neighbouring products (at 10M and 100M) to support its conclusion that BT has SMP even at 10G (where its shares are much lower) in the LP and RoUK. However, it is only appropriate to rely on BT's shares lower down the chain by including them in the same relevant market if those non-neighbouring products do in fact impose a sufficiently meaningful constraint further up the chain. A reality check is

[43] T15/1550.

necessary: even if 100M constrains 1G, this does not mean it will necessarily constrain 10G. To know whether the 10M and 100M products constrain products further up the chain it is necessary to consider whether a hypothetical monopolist of both 1G and 10G would be constrained by switching (or delayed migration) from these lower bandwidth products. In the absence of this check being carried out it cannot safely be assumed that BT's market position at the lower bandwidth products has sufficient relevance to its competitive position at 10G and higher.

335. We do not understand footnote 41 of the OFT Guidance to mean that where an authority examines competitive conditions across a broad industrial sector, the relevant market it ultimately defines should be correspondingly broad (as Mr Holmes appeared to suggest in the quote above). Rather, it seems to us that it is merely restating the point that the relevant product market which is ultimately defined *may* depend upon the initial selection of focal product(s). Moreover, if an authority is correct to find that all the products in the chain fall within a single relevant market owing to transmission effects across the chain, then the starting point of the SSNIP analysis will have no impact on the outcome (i.e. whether the starting focal product is 10M or 100G, or both, the outcome will ultimately be the same single market). This is because a SSNIP will only be profitable if the hypothetical monopolist controls all products in the chain. We therefore consider that Ofcom's reliance on the footnote 41 of the OFT Guidance is misplaced.

336. It therefore appears to us that Ofcom could not safely reach the view that there is a single market spanning the CISBO spectrum without considering carefully whether indirect constraints do exist across the chain or whether sub-groups within the overall chain themselves form relevant markets, disrupting such transmission.

(c) Did Ofcom err by not checking pricing interactions at the extremes of the chain?

Pricing at the extremes of the chain

337. Para 58 of the Notice on Market Definition states that care must be taken to avoid defining a market too widely:

> "58. From a practical perspective, the concept of chains of substitution has to be corroborated by actual evidence, for instance related to price interdependence at the extremes of the chains of substitution, in order to lead to an extension of the relevant market in an individual case. Price levels at the extremes of the chains would have to be of the same magnitude as well."

338. The final sentence of para 58 refers to price levels "of the same magnitude". This phrasing is potentially ambiguous. The Tribunal accepts the parties' agreed position that this passage should be read as a reference to prices of the same "order of magnitude". This is the manner in which the passage is phrased in the French language version of the Notice on Market Definition:

> "Les niveaux de prix aux extrêmes des chaînes doivent aussi être du même **ordre de** grandeur."
>
> (Emphasis added.)

339. A similar remark is found in the final sentence of para 62 of the SMP Guidelines which warns that "[g]iven the inherent risk of unduly widening the scope of the relevant market, findings of chain substitutability should be adequately substantiated ([50])." Footnote 50 provides as follows:

> "([50]) Evidence should show clear price interdependence at the extremes of the chain and the degree of substitutability between the relevant products or geographical areas should be sufficiently strong."

340. We note that neither the Notice nor the SMP Guidelines discuss what we have termed the "chain substitution transmission effect". Instead, both documents appear more concerned with the question whether a focal product 'B' should be considered to be a market in itself or part of a wider market including neighbouring products 'A' and 'C'. The guidelines do not appear to be considering the question whether A constrains C or *vice versa*. For example, the SMP Guidelines state at para 62:

> "chain substitutability occurs where it can be demonstrated that although products A and C are not directly substitutable, product B is a substitute for both product A and product C and therefore **products A and C may be in the same product market since their pricing might be constrained by the substitutability of product B.**" (Emphasis added).

341. If it is the case that the prices of A and C are constrained by B then one would expect that as the price of product B falls or rises the constraint imposed by B on A and C will increase or decrease. Thus, the prices of A and C might rise and fall in sync despite those products not being directly substitutable with each other. However, the fact that products A and C rose and fell in sync would not in itself reveal whether or not they were indirectly constraining each other, although it might be consistent with an indirect constraint existing.

342. The rationale for the statement in the Notice on Market Definition that "[p]rice levels at the extremes of the chain would have to be of the same [order of] magnitude as well" is unclear to us. It is possible that the authors of the Notice had in mind a relatively homogeneous product such as motor vehicle fuel rather than the (vertically) differentiated products at issue in these proceedings. We can see no reason in principle to rule out the possibility of a chain of substitution where the products are differentiated by quality such that prices at the opposite ends varied by more than an order of magnitude.

343. Ofcom reached the view that there was actual evidence of pricing interdependence throughout the chain, including direct evidence of competitive interactions between 1G and 10G. This is discussed in more detail above where we conclude that this link between 1G and 10G had not been established.

344. Ms Curry also suggested that "[i]t is not necessary for there to be direct price interactions between the products at the extremes of the chain. However there does need to be a direct price interaction between a product at one extreme of the chain and the adjacent product that forms the next link in the chain".[44] In her written report she stated:

[44] Joint Expert Statement, Point 21.

> "As long as the evidence suggests adjacent links are all effective substitutes for one another, there will be a chain of substitution **linking the products into a single market**: even though the extremes of the chain may not be a direct substitute for one another." (Emphasis added.) [45]

345. Ms Curry elaborated on this point during cross-examination:

> "The question is the degree of substitutability at each link of the chain through which if the degree of substitutability between each link was strong you would expect to see a change in price at 10Mb ultimately reflected in a change in price at the higher bandwidth. That effect may take some time to work through but you would expect if customers at 10Mb responded to that change and if it was a reduction in price and attracted customers from 100Mb and the supplier of 100Mb then had to adjust its prices, then the supplier of 1G would have to adjust its prices so as not to lose customers to 100Mb and so forth until the pricing constraint was transmitted through the chain."[46]

346. We do not agree with this evidence for the reasons explained in the previous subsection (see paragraphs 330 to 335 above).

347. BT criticised this approach of Ms Curry and argued that the Notice ensures that there is a robust sense check applied to guard against this risk that the relevant market will be over-extended.

348. Where evidence of pricing interdependence (or evidence of a lack of pricing interdependence) exists we consider that this is a factor that should be taken into account by the authority or Tribunal. However, the implication of this factor will need to be considered carefully. As noted at paragraph 341 above, where such pricing interdependence exists this may indicate that the 'middle' product may be exerting a constraint on more peripheral products. Pricing interdependence might potentially be consistent with a finding that chain substitution transmission effect exists throughout a chain of substitution, but it will not be conclusive on its own.

[45] Curry 1, §138.
[46] T12/1105.

349. In the present appeal, BT has successfully cast sufficient doubt on Ofcom's contention that there is a link between 1G and 10G for us to remit the matter to Ofcom for reconsideration and we therefore need not form a concluded view on whether Ofcom erred in failing to test pricing interactions at the extremes of the chain.

(14) Conclusion on product market definition

350. For the reasons set out in sections F(11) and F(12) above we find that Ofcom erred in concluding that it was appropriate to define a single product market for CISBO services of all bandwidths. As we are not in a position to substitute our own view we will quash this aspect of the decision and remit it to Ofcom for reconsideration.

G. GEOGRAPHIC MARKET DEFINITION

(1) What is the purpose of defining geographic markets?

351. Put simply, the purpose of geographic market definition is to ensure that the competitive conditions within defined geographic markets are sufficiently homogeneous. A useful starting point is the Notice on Market Definition. It explains that:

> "8. 'Relevant geographic markets' are defined as follows:
>
> 'The relevant geographic market comprises the area in which the undertakings concerned are involved in the supply and demand of products or services, in which the conditions of competition are sufficiently homogeneous and which can be distinguished from neighbouring areas because the conditions of competition are appreciably different in those area'.
>
> 9. The relevant market within which to assess a given competition issue is therefore established by the combination of the product and geographic markets. The Commission interprets the definitions in paragraphs 7 an 8 (which reflect the case-law of the Court of Justice and the Court of First Instance as well as its own decision-making practice) according to the orientations defined in this notice."

352. The SMP Guidelines (and the case-law referred to therein) are also instructive. Paras 55 to 57 provide that:

> "55. Once the relevant product market is identified, the next step to be undertaken is the definition of the geographical dimension of the market. It is only when the geographical dimension of the product or service market has been defined that a NRA may properly assess the conditions of effective competition therein.
>
> 56. According to established case-law, the relevant geographic market comprises an area in which the undertakings concerned are involved in the supply and demand of the relevant products or services, in which area the conditions of competition are similar or sufficiently homogeneous and which can be distinguished from neighbouring areas in which the prevailing conditions of competition are appreciably different. The definition of the geographic market does not require the conditions of competition between traders or providers of services to be perfectly homogeneous. It is sufficient that they are similar or sufficiently homogeneous, and accordingly, only those areas in which the conditions of competition are "heterogeneous" may not be considered to constitute a uniform market.
>
> 57. The process of defining the limits of the geographic market proceeds along the same lines as those discussed above in relation to the assessment of

the demand and supply-side substitution in response to a relative price increase."

(Footnotes omitted.)

353. The BEREC Common Position is equally informative on this issue:

"Thresholds to aggregate geographical areas

(128) In order to group geographical units, there is no need for competitive conditions to be perfectly homogeneous across all geographical areas included within one market.

(129) Areas should be aggregated so that competitive conditions within a market are sufficiently homogeneous whereas competitive conditions differ between markets with potential effects on either the SMP finding or the identified competition problems. With a large number of small areas, however, there is likely to be a continuum of competitive conditions, so it will usually be difficult to draw a clear line between more and less competitive areas. One approach would be to evaluate competitive conditions in each geographical unit on its own and classify the area accordingly. However, this would cause a huge workload for NRAs and is also likely to be arbitrary to some extent. A more practical and appropriate approach is to define clear and unambiguous criteria according to which the geographical units are grouped. In this regard, it is important for NRAs to bear in mind the purpose of market definition, which is not an end in itself but a means to undertaking an analysis of competitive conditions, for the purposes of determining whether ex-ante regulation is required or not.

(130) As mentioned above, in case of significant differences in competitive conditions, the criteria listed before are likely to be closely correlated. However, the correlation is unlikely to be perfect. It is, therefore, likely to be appropriate to base the segmentation on a combination of several of the criteria mentioned above. A segmentation based on a single criterion (e.g. the number of operators) will usually not be appropriate. Which criteria are the most relevant will – as in an SMP analysis – depend on the circumstances and has to be decided by the NRA. The relevant criteria should be applied cumulatively and in such a way that differences in competitive conditions between different markets are large while differences in competitive conditions within a market are small.

(131) For each of the criteria applied, the NRA will have to define some threshold according to which a particular area is classified.

(132) A related question is whether or not the identity of alternative operators should also play a role for aggregating areas. If, for example, an incumbent DSL operator competes with a cable operator in city A and with another cable operator in city B, should the two cities form a single geographical market or not? BEREC is of the opinion that the homogeneity of competitive conditions should be the decisive criterion and not the identity of the alternative operator. This means that, if the analysis of the criteria mentioned above indicates that competitive conditions are similar, cities A and B should form a single geographical market. If, however, one cable operator behaves differently from the other, this should become apparent in the course of the analysis and may lead to a situation where the two cities form different

> geographical markets (because competitive conditions are not sufficiently homogeneous).
>
> (133) The definition of geographical markets will depend on factors which vary over time, e.g. the number of operators in a particular area or measures of demand. Therefore, the conclusions with regard to the appropriate grouping of the geographical units may change if the analysis is performed at a later point in time. This is, in principle, not different from product market definitions, which may also change in the period from one market review to the next. The task of the NRA is to take into account foreseeable future developments at the time of market definition and make a forward-looking analysis. In the case of geographical market definition, this can mean that, for example, information about future roll-out plans of the incumbent operator and its main competitors has to be collected.
>
> (134) Once the (forward-looking) geographical segmentation has been made, it makes sense, from the point of view of legal certainty and practicability, not to change it until the next review, even if future developments are somewhat different from those expected. If future developments are very different from those expected, a new analysis is likely to be needed anyway."

354. This guidance makes it clear that it is not necessary for competitive conditions in a geographic market to be entirely homogeneous, but merely that they should be "sufficiently" similar. There is therefore naturally some flexibility in the process of defining geographic markets.

355. Para 129 of the BEREC Common Position also acknowledges that questions of practical administration are relevant and that if there were potentially a large number of small geographical units, the NRA might be justified in amalgamating some units into one geographic area so as to avoid "a huge workload" – presumably in testing for SMP and/or regulating competition in a large number of such areas. However, considerations of practicality do not arise from economic principle, and in this appeal it was not suggested to us that the number of candidate areas was so great that it was practically necessary for Ofcom to amalgamate them together. There were only four such candidate areas: and even if the CBDs had been regarded as separate areas, there would still only be eight areas.

356. It is also important to read the observation at the end of para 129 in context. The suggestion that "in this regard", it is important for NRAs to bear in mind the purpose of market definition, which is not an end in itself but a means to

undertaking an analysis of competitive conditions, does not indicate that market definition can be disregarded, but simply that some approximation and pragmatism may be legitimate when defining geographical markets.

(2) Ofcom's approach to geographic market definition

357. In closing, Mr. Holmes conveniently summarised Ofcom's geographical market definition analysis as follows:

> "242. Ofcom's [geographical market definition] analysis had two principal steps, which are described in detail in Curry 1, §§346-400. First, Ofcom identified 'candidate areas'. This is a necessary first step, as one must necessarily have *some* way of identifying possible geographic areas in order then to ask whether they are sufficiently homogeneous and distinct to form their own market. In order to identify candidate areas, Ofcom first applied two tests:
>
> a. The Boundary Test, which was used to identify "*areas where competition is strongest and appears likely, even at this stage, to be effective*". The test was satisfied in places where businesses have (i) an average of five or more OCPs within 100m, or (ii) an average of four or more OCPs within 100m and 90% of businesses are within 100m of at least two OCPs.
>
> b. The HNR [Network Reach] test, which was used to identify "*other areas where there is somewhat more competition than in the rest of the UK to an extent that merits further analysis, possibly leading to the definition of a separate market and/or variation in remedies*". The HNR test was satisfied in places where the average business had two or more OCPs' networks within 200m.
>
> 243. The results of these tests, taken together with considerations of scale, contiguity and regulatory consistency, led Ofcom to identify four candidate areas: the Central London Area ("**CLA**"), the London Periphery ("**LP**"), the Central Business Districts of the five largest cities outside London ("**CBDs**"), and the rest of the UK excluding the Hull area ("**RoUK**").
>
> 244. Second, Ofcom considered, using additional indicators, whether competitive conditions in the candidate areas were sufficiently homogeneous and distinct to warrant defining them as separate markets. This resulted in Ofcom defining only three geographic markets: the CLA, the LP and the RoUK (including the CBDs)."

(Footnotes omitted.)

(3) The issues

358. The outline of the parties' arguments on geographic market definition are set out in Section E(3) at paragraphs 123 to 146 above. We shall first consider the

decision not to define the CBDs as a separate market from the RoUK, and then consider briefly the remaining issues identified in the List of Issues.

(4) The competitive conditions in the CBDs and the RoUK

(a) Ofcom's identification of the CBDs in the May 2015 BCMR Consultation

359. In Opening, Mr Holmes summarised how the CBDs of Birmingham, Bristol, Glasgow, Leeds and Manchester were defined as follows:

> "Ofcom identified five cities with the largest density of rival infrastructure outside London, as is explained in [FS § A10.234]. The CBD areas themselves were defined as the blocks of contiguous sectors in those cities which passed the High Network Reach Test, and that is explained in footnote 218 of the final statement. The remainder of the country was classified as the Rest of the UK. Although there were some isolated postcode sectors in this area which would have passed the High Network Reach Test (for example, in Edinburgh), those were not of material scale and were therefore not identified as possible candidate areas for separate consideration."[47]

360. By way of illustration, the maps below show the network reach values for the cities of Glasgow and Manchester. These maps are taken from Annex 10 to the FS (Figures A10.50 and A10.52). The coloured areas represent the CBDs. Annex 10 to the FS also contains network reach maps for the other main cities: Birmingham, Bristol and Leeds.

[47] T4/483.

Figure 6: Network Reach values for Glasgow (FS Fig A10.50)

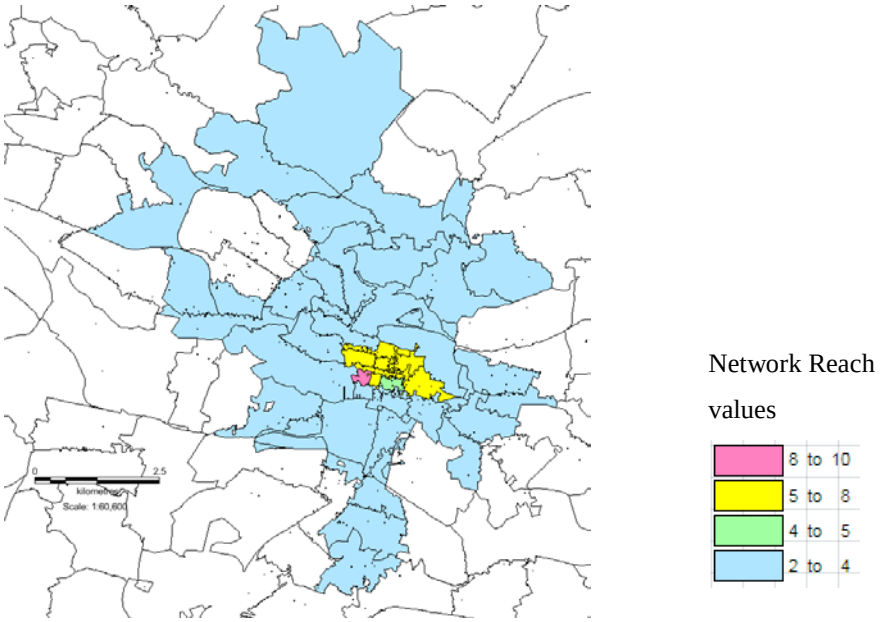
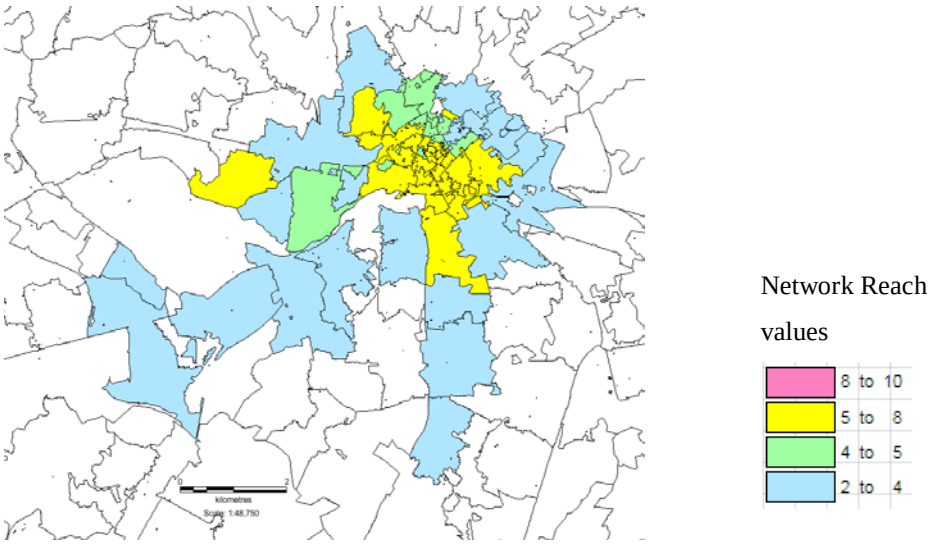


Figure 7: Network Reach values for Manchester (FS Fig A10.52)



(b) The decision by Ofcom not to define the CBDs as a separate market

361. At FS 4.429 Ofcom stated that in defining the relevant geographic markets, it placed most weight on the presence and extent of rival infrastructure in identifying variations in competitive conditions between the candidate areas. It then went on to consider those metrics together with the geographic

distribution of service shares, the evidence of geographic variations in pricing, and other structural indicators.

362. Having done so, at FS 4.450 to 4.455, Ofcom specifically addressed the position of the CBDs. Ofcom observed that although the network reach metrics suggested that the competitive conditions in the LP (which it did define as a separate market) and the CBDs were similar, it thought that there were five reasons for not defining the CBDs as a separate market from the RoUK. These were as follows:

(1) Ofcom expressed the view that although "the overall infrastructure presence is superficially similar" between the LP and CBDs, "the depth of competition is greater in the LP at least for some segments than in the CBDs". The FS then made a comparison between the infrastructure presence in the VHB segment of the CISBO market in the LP and CBDs, the market shares of BT and VM in the different areas, and the Herfindahl-Hirschman (concentration) index (**"HHI"**)[48] for VHB services in the LP, the CBDs and the RoUK (FS 4.451).

(2) Ofcom considered that the CBDs do not benefit from the close physical links of the LP to the CLA. Ofcom thought that this meant that CPs were likely to find it more attractive to invest in incremental network expansion in the LP than in the CBDs, because the geographic proximity of the LP to the CLA presented the potential for CPs with network in the CLA to benefit from further economies of scale and scope (FS 4.452).

(3) Ofcom observed that leased lines services in the LP have not been subject to full charge control regulation as part of the WECLA following the 2013 BCMR, whereas services in the CBDs have been fully regulated (FS 4.453).

[48] The HHI is calculated by squaring the market share of each firm competing in a market, and then summing the resulting numbers.

(4) Ofcom considered that in the CBDs, the low volume of VHB services made it less likely that a VHB segment, on its own, could support entry of a competitor looking to supply that segment (FS 4.454): and the low volumes meant that suppliers would be vulnerable to rapid and significant change, as customers moved up the bandwidth chain.

(5) Ofcom stated that because it came to the same SMP finding and would impose the same remedies in relation to the CBDs as in the RoUK, it did not consider it appropriate to define a separate geographic market for the CBDs (FS 4.455).

363. In para 387 of her written evidence, Ms. Curry essentially reiterated all but number (3) of these points, stating that the evidence that Ofcom took into account was as follows:

> *"(a) Network Reach to large business sites.* Average Network Reach for the CBDs was higher than in the RoUK with an average of 2.8 (4.3) OCPs within 100m (200m) compared to equivalent figures of 0.8 (1.1) OCPs within 100m (200m) in the RoUK. These values were similar to average network reach in the LP, where the equivalent figures were 2.5 (4.1) OCPs within 100m (200m) (FS §4.426).
>
> *(b) Network reach at existing VHB sites.* In contrast to the LP, Network Reach at existing VHB sites in the CBDs was not appreciably higher than in the RoUK (to the extent which might be relevant to an assessment of SMP and/or remedies). In particular, in the CBDs, 28% (64%) of VHB customer ends were found to be within 100 (200) metres of four or more OCPs, compared to 55% (85%) in the LP and 5% (18%) in the RoUK (FS Table A10.39).
>
> *(c) Market concentration.* The CISBO market in the CBDs is highly concentrated with BT and Virgin Media holding a combined 80% share (and also 80% in the VHB segment). These levels of concentration in the CBDs are close to those seen in the RoUK, where the combined BT and Virgin Media share is 88% for all CISBO segments and 85% in the VHB segment. The HHI index for VHB services in the CBDs is similar to the RoUK (3,937 compared with 3,860). This is in contrast to the LP where, as noted above, market concentration appears appreciably lower on these measures (FS §4.451).
>
> *(d) Scale of local market and prospects for incremental infrastructure expansion.* The CBDs are five small and geographically separated districts whose surrounding areas show little demand for leased lines and low Network Reach, suggesting they are less likely to support sustainable competition or attract incremental infrastructure expansion than the LP and to be similar in this respect to the RoUK (FS §4.452)."

364. At para 390 of her statement, Ms Curry also commented that:

> "Despite the differences highlighted above, competitive conditions in the CBDs are similar in all material respects to those in the RoUK (in the sense that SMP findings and appropriate remedies are likely to be the same in both areas). For example, BT's share of the CISBO market in the CBDs as a whole is above 40% (ranging from […]% [✂] in Glasgow to […]% [✂] in Manchester by volume, and from […]% [✂] in Glasgow to […]% [✂] in Manchester by revenue).[49] These shares are similar to BT's share in the RoUK in the sense of being at levels typically associated with a dominant position. Market concentration too is similar in the CBDs to the RoUK, with an HHI of 3,395 in the CBDs (ranging from 3,040 in Leeds to 4,129 in Manchester) compared with 4,259 in the RoUK."

365. So far as the point regarding scale and prospects for infrastructure expansion, Ms. Curry's written evidence dealt with this by way of a comparison between the CBDs and the LP. She said:

> "397. A likely explanation for the difference in competitive conditions between the LP and the CBDs, and the reason I would expect this difference to persist, is the difference in local market size. The CBDs are five relatively small and geographically distinct areas, which lack the scale of the LP in terms of potential market size: particularly in relation to the VHB segment, which has historically been a significant driver of infrastructure investment.
>
> 398. […] the volume of VHB circuits in the CBDs is very low, ranging from as few as 19 circuits in Bristol to a maximum of still only 79 circuits in Birmingham. Demand for VHB circuits in the LP (whilst still small in relation to the CLA) is an order of magnitude greater than in any of the CBDs at 762 circuits. The number of businesses too is far lower in the CBDs than in the LP: ranging from 691 to 1,146 in the largest CBD compared to 3,378 in the LP. This reflects their physical scale. Whilst the LP comprises 145 contiguous postcode sectors, the CBDs range from 15 to 49 postcode sectors.
>
> 399. The fact the LP borders the CLA is also likely to have affected the relative success of rival OCPs in this area compared to the CBDs to date. This is because of the very high levels of rival infrastructure in the CLA, and the fact that CPs are likely to find it more attractive, all else equal, to expand their networks incrementally. Thus even if the CBDs offered the same prospects in terms of the contestable market size (which they do not for the reasons set out above), OCPs would be more likely to expand their networks from the CLA into the LP than they would to invest in a new infrastructure presence in one of the CBDs.
>
> 400. As noted above, the only real difference in Ofcom's assessment of competition in the LP compared to the RoUK was the finding that some high value sites appeared to have a degree of competitive choice. The fact that concentration in the CBDs appears high in all segments (and likely to remain

[49] More aggregated versions of these figures were presented in FS Table 4.4. As Ofcom observed in the note to this table, data was presented in that Table on an aggregated basis for reasons of presentational convenience. Some of the results of Ofcom's more disaggregated analysis for the individual CBDs were presented in Annex 10.

> so) means that, in all material respects, these areas are more aligned in competitive conditions to the RoUK than to the LP."

366. In cross-examination, Ms. Curry reinforced the thrust of Ofcom's approach to geographic market definition:

> "In relation to geographic market definition, Ofcom was clear that it placed most weight on presence and density of rival infrastructure as measured by the large array of network reach measures that it considered. The variations in network reach would drive variations and competitive conditions across different geographic areas."

367. Ms. Curry also reiterated that Ofcom had decided not to define the CBDs as a separate geographical market because of a view that it reached that BT would have SMP in the CBDs in any event and that there was no reason to impose different remedies upon BT in relation to the CBDs than in the RoUK:

> **Q (Mr Beard)** [Ofcom] does not identify competitive conditions for the supply of VHB to differ widely from one geographic area to another, does it?
>
> **A (Ms Curry)** No, it concludes that outside of the London Periphery there is no case to vary the remedies in the VHB segment anywhere else in the Rest of the UK. But it does look at whether there is that case within the Rest of the UK focusing initially on the Central Business Districts, and the reason it does not then go further to see if there are any other areas beyond the Central Business Districts, where there may also be a case for varying remedies in that segment, is that the CBDs were seen as the most likely areas outside of the London Periphery to have greater potential for competition. So, when Ofcom concluded that both BT was likely to have SMP in that area and that there was unlikely to be a case for varying the remedies in those areas, there was no need for Ofcom to go further and look at whether there were any other areas in addition to the CBDs where there may be a case to define separate geographic markets on that basis.[50]

(c) Analysis

368. The main table of metrics in the FS shows both the presence and density of rival infrastructure and market shares. We note at the outset that the figures for the RoUK in the table include the CBDs. Without the inclusion of the

[50] T13/1255-1256.

CBDs, the figures for the presence of rival infrastructure in the RoUK would be slightly smaller.

Table 7: Ofcom's overview of relevant metrics (based on FS Table 4.4)[51]

Competitive indicators	Metrics		CLA	LP	CBDs in other cities****	Rest of UK (exc. Hull)
Rival infrastructure	Average network reach* (100 metres)		6.2	2.5	2.8	0.8
	Average network reach (200 metres)		8.0	4.1	4.3	1.1
	Average network reach (500 metres)		9.5	6.5	6.9	1.9
	Depth of network reach – 100 metres (200 metres)**	1+	100% (100%)	96% (99%)	97% (99%)	61% (71%)
		2+	99% (100%)	68% (91%)	79% (95%)	15% (30%)
		3+	98%(100%)	40% (78%)	55% (84%)	5% (12%)
		4+	93%(100%)	22% (59%)	30% (65%)	2% (5%)
		5+	83% (98%)	11% (37%)	15% (46%)	1% (2%)
Distribution of service shares	BT share***	Low bandwidth TISBO	63%	69%	88%	94%
		CISBO up to and including 1Gbit/s	47%	50%	47%	58%
		- Low CISBO	41%	44%	40%	46%
		- Medium CISBO	55%	57%	54%	69%
		- High CISBO	35%	45%	48%	69%
		Very high CISBO	12%	16%	21%	32%
		CISBO Total (by revenue)	38%	42%	45%	55%
		CISBO Total (by volumes)	45%	48%	46%	57%
	Virgin Media share	CISBO up to and including 1Gbit/s	9%	25%	33%	30%
		Very high CISBO	11%	36%	58%	53%
		CISBO Total	9%	25%	34%	31%
	Combined BT and Virgin Media share	CISBO up to and including 1Gbit/s	56%	75%	80%	88%
		Very high CISBO	24%	52%	80%	85%
		CISBO Total	54%	73%	80%	88%
	Concentration (HHI)	CISBO Total	2,807	3,112	3,395	4,259
Other structural Indicators	Number of circuits	CISBO up to and including 1Gbit/s	30,597	11,705	13,783	256,165
		Very high CISBO (incl. MNO backhaul)	1966	762	250	8,578
	Number of businesses		4,239	3,378	4,428	149,816
	Square kilometres		33	232	132	246,756
	Business density (number of businesses per square kilometre)		128	15	34	1
	Linkages to the centre of London		-	Strong	Weak	Weak

369. Contrary to the view taken by Ofcom, we consider that the metrics in this table do not support the conclusion that the competitive conditions in the CBDs and the RoUK are sufficiently homogeneous to justify placing the CBDs and the RoUK in the same geographical market.

[51] Confidential materials and rows on 'Pricing and profitability' omitted.

370. Taking first the rival infrastructure metrics that Ofcom emphasised in FS 4.451, we consider that Ofcom essentially asked itself the wrong question when comparing the CBDs to the LP. The issue was not whether the CBDs were sufficiently similar to the LP: the issue was whether the CBDs were sufficiently similar to the RoUK. In that regard, on each of the Average Network Reach metrics, the CBDs are very different from the RoUK. So, for example, on the number of rival OCPs within 100m (200m), the CBDs are 2.8 (4.3) as opposed to 0.8 (1.1) in the RoUK. Those numbers are in no way comparable, and in fact show an even greater difference between the RoUK and the CBDs than between the RoUK and the LP (2.5 (4.1)), which Ofcom did define as a separate geographical market.

371. Likewise, when considering the depth of network reach, expressed in terms of the percentage of businesses in an area located within the buffer distance of the specified number of OCPs, there is a very marked difference between the CBDs and the RoUK. For example, 95% of businesses are within 200m of 2 or more OCPs in the CBDs, but only 30% of businesses in the RoUK are within the same distance of 2 or more OCPs. And whilst 65% of businesses in the CBDs are within 200m of 4 or more OCPs, the figure for the RoUK is only 5%. Indeed, on every metric of this type, there is a greater difference between the RoUK and the CBDs than between the RoUK and the LP (which Ofcom defined as a separate geographical market).

372. In her evidence, as set out in paragraph 363 above, Ms. Curry also referred to figures for the depth of network reach at existing VHB sites only, which were set out in the following Table A10.39 in Annex 10 to the FS.

Table 8: Proportion of VHB and LB CISBO customer ends within a buffer distance of greater than or equal to four OCPs, per geographic area (FS Table A10.39)

	VHB CISBO		LB CISBO	
Area	**100m**	**200m**	**100m**	**200m**
CLA	97%	100%	93%	99%
LP	55%	85%	39%	67%
CBDs	28%	64%	35%	65%
RoUK (inc. CBDs)	5%	18%	3%	9%

373. Ms. Curry fastened on the metrics in this table for the number of businesses having four or more VHB OCPs within 100m, pointing out that the CBDs had 28% whilst the LP had 55% and the RoUK 5%. Quite apart from the fact that this does not show that the CBDs (at 28%) were similar to the RoUK (including the CBDs) (at only 5%), we do not in any event accept that this comparison is valid. Ofcom defined its product market to include all CISBO services, and hence there was no logical justification for having regard to only a selected part of that product market (VHB) when examining the question of competitive conditions for the purpose of defining the geographic market. That is quite clear from the terms of para 56 of the SMP Guidelines:

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

In our view, the "relevant products or services" must obviously be the entirety of the relevant products or services.

374. In relation to the Distribution of Service Shares, and again bearing in mind that Ofcom had defined a single product market for all CISBO services, it is readily apparent from Table 4.4 in the FS that BT's share of the total CISBO volumes in the CBDs (46%) was appreciably different from the RoUK (57%), and indeed almost identical to the CLA and LP (45% and 48% respectively). Even taking BT and VM together, and ignoring the issues that arise out of looking at the combined BT and VM share in a case where collective

dominance is not being asserted, we do not consider that the 80% for the CBDs is obviously sufficiently similar to the 88% for the RoUK (including the CBDs).

375. Moreover, looking at the concentration (HHI) figures for total CISBO, the CBDs (3,395) are again very different from the RoUK (4,259) and in fact much closer to each of the CLA (2,807) and the LP (3,112) (which Ofcom considered to be separate geographical markets). In her written evidence, Ms. Curry chose, in our view wrongly, not to refer to these metrics but instead to rely upon HHI metrics simply for the VHB segment of the CISBO market.

376. For very similar reasons we also do not accept Ofcom's analysis set out in paragraph 365 above concerning the scale of current VHB infrastructure in the CBDs, or the comparison between the CBDs and the LP as regards the potential for CPs to expand their VHB infrastructure incrementally. We have already made the point that (on Ofcom's case) the relevant product market includes all CISBO products and not just VHB; and we also do not think that the fact that the CBDs might not benefit from incremental expansion from the CLA in the same way as the LP might benefit, assists in assessing the homogeneity of competitive conditions between the CBDs and the RoUK (neither of which border the CLA).

377. Indeed, the evidence that was placed before us as regards competitive conditions in the CBDs suggested that there were small but identifiable and relatively contiguous areas in the centre of each of the CBDs which passed the Boundary Test. By way of illustration, these areas in the cities of Glasgow and Manchester are shown below. Annex 10 to the FS also contains network reach maps for the other main cities: Birmingham, Bristol and Leeds.

Figure 8: Glasgow - postcode sectors passing one or more of the Boundary Test conditions (FS Fig A10.56)

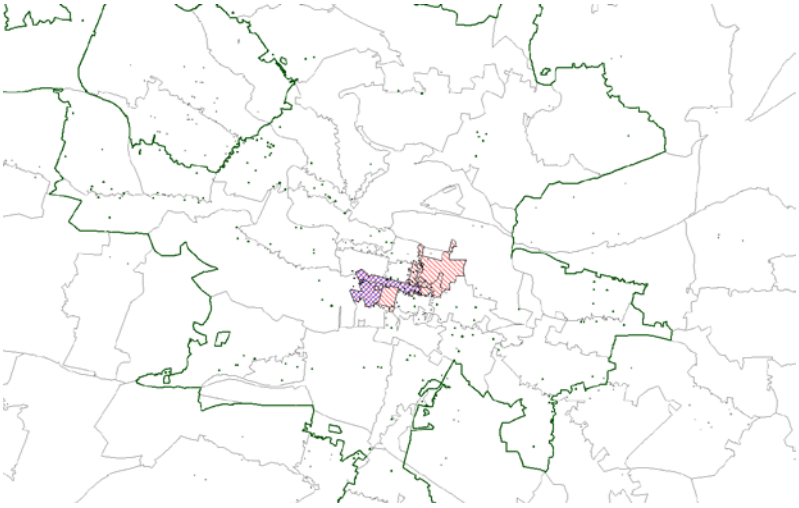
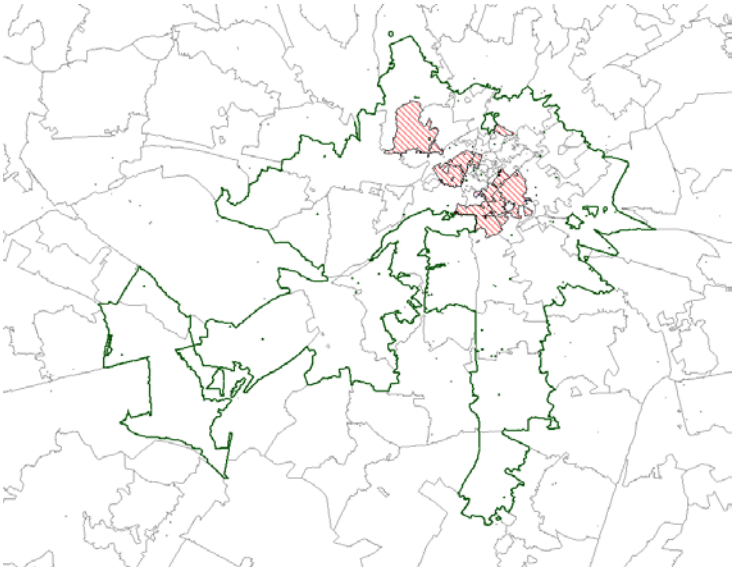


Figure 9: Manchester - postcode sectors passing one or more of the Boundary Test conditions (FS Fig A10.58)



378. This indicated that, at least on that important infrastructure metric, competitive conditions in those central areas of five of the UK's major cities were equivalent to the conditions in the CLA, and hence that they were fully competitive. Quite apart from the separate question of why those central areas of the major cities in the UK would not qualify for deregulation in the same way as the CLA in London, at very least it might be thought that those areas would contain sufficient existing infrastructure from which (on Ofcom's

thesis) some incremental expansion into the remainder of the relevant CBD might occur.

379. The position in relation to central Manchester was also specifically addressed in the evidence from Mr. Farmer of Gamma, who indicated that there was existing competition and the potential for further investment and expansion in that area:

> "34. I understand that all the parties to this appeal agree that the market in the CLA is sufficiently competitive. Gamma agrees, although in our response to Ofcom in the BCMR consultation we noted that there were pockets of London known to suffer from *prima facie*, substantial underinvestment in data services.
>
> 35 Where Ofcom erred was in its failure to recognise that competitive conditions varied very significantly in the RoUK. In Manchester, for example, as noted in §66 of the witness evidence of Mr Hart for CityFibre, Gamma competes with CityFibre, Zayo, SSE, EU Networks and BT for higher bandwidth services on our own respective access networks. We believe that Virgin, Vodafone, COLT and Verizon have assets in Manchester capable of competing too (although we would not necessarily place them in the same class as the operators listed in my previous sentence in terms of willingness to participate in the provision of higher bandwidth services at the wholesale level). As a result, one could argue that there are at least BT+8 providers in central Manchester. We often find ourselves in a competitive tender situation and sometimes the result is dual sourcing, whereby a customer secures a solution from Gamma in conjunction with another provider […].
>
> 36 In Gamma's view, therefore, the market in central Manchester at least is truly competitive and there is a real possibility of further infrastructure investment there. Those conditions are also replicated, or potentially on course to being replicated, in a number of other urban areas in the United Kingdom […]."

380. Mr. Farmer was not challenged on this evidence, and Ms Curry was not able to present any persuasive rebuttal of it when it was put to her in cross-examination. She simply indicated that she preferred Ofcom's own analysis of the metrics (which we have dealt with above) and suggested that Gamma's experience of competition might not correspond with the competitive constraints upon BT.

381. These errors in the way in which Ofcom approached the infrastructure metrics in relation to the CBDs were, in our judgment, compounded by the way in which it approached the question of EFM. As indicated above, Ofcom

included EFM in its product market definition but did not include a provider of EFM as an OCP when defining or applying its Network Reach and Boundary Tests of "BT + n" OCPs.

382. Ofcom's explanation for excluding EFM from this central part of its geographic market definition was given in FS 4.391 – 4.393. Ofcom accepted that EFM competitors should be taken into account in its overall market assessment as it had included EFM in the CISBO market, and it also accepted that they will have a degree of competitive impact "at least at lower bandwidths".

383. However, Ofcom stated that because EFM is not delivered through an operator's own network but through LLU inputs and copper pairs, the network reach test of presence within a certain buffer distance could not really be applied to EFM providers; and that because such copper lines are widely available, EFM would in any event account for little of the relevant geographical variation in competitive conditions. Ofcom also justified its treatment of EFM on the basis that the competitive constraint of the presence of an EFM operator is not equivalent to that of an operator with fibre infrastructure.

384. Ofcom's explanation was further elaborated in FS A9.40:

> "We consider that we should take account of the competitive constraint provided by EFM operators in our market analysis. We have done so by including EFM operators in our CISBO market share calculations and taking them into account in our qualitative assessment of SMP, but not by directly including such operators in the network reach analysis. This is because EFM can only be used to supply bandwidths of up to about 40Mbit/s, and so the competitive constraint provided by an EFM operator is not equivalent to that of an operator with its own fibre infrastructure able to supply all bandwidths. As a result, we do not consider it appropriate to treat infrastructure used to provide EFM circuits as equivalent to infrastructure used to provide CISBO circuits: which is what we would effectively be doing if we were to include EFM directly in our network reach calculations. Instead, when considering whether the rival infrastructure identified in our network reach analysis is sufficient for effective competition in each of the geographic markets defined, we take into account whether EFM services would be available in that area and the constraint they would provide in doing so. As EFM operators do not need their own networks near to customer sites, an assessment of network reach is not needed to identify areas where they are able to supply customers. Instead, we identify the presence of EFM in an area

based on BT exchanges that LLU operators have unbundled (i.e. co-located at that exchange)."

385. When the EFM point was raised by BT and others, Ms. Curry responded in writing:

> "I agree it is nonetheless important that any geographic variations in the constraint from EFM should be taken into account in delineating market boundaries and I recognise that low bandwidth circuits (for which EFM is a closer substitute) comprise a significant proportion of all CISBO circuits. As explained above, Ofcom did look at geographic variations in EFM presence, and concluded that it followed a similar pattern to the geographic markets identified from its analysis of CISBO services (FS A10.15). In particular, it found there were more CPs offering EFM at exchanges in the CLA than in the LP, CBDs and RoUK. Furthermore, the analysis […] shows that EFM only accounts for just over 10% of volumes overall, so will not be an appreciable driver of competitive differences."

386. Ms. Curry was cross-examined over the treatment of EFM in the geographical market definition:

Q (Mr Beard)	EFM will exert a competitive constraint on fibre pricing for products for which it is substitutable, will it not?
A (Ms Curry)	Yes.
Q (Mr Beard)	So it applies a competitive constraint on fibre providers for sites seeking lower bandwidths, does it not?
A (Ms Curry)	It provides a direct constraint on prices for those services for which it is a direct substitute, yes.
Q (Mr Beard)	But EFM provision is not counted at all in the Boundary Test or the high network reach test at all, is it?
A (Ms Curry)	No, it is taken in consideration in defining geographic market boundaries in a different way. […]
Q (Mr Beard)	But EFM is part of the product market and does apply competitive pressure through, on your case, the chain of substitution?
A (Ms Curry)	The constraint will flow indirectly from the lowest bandwidth to the highest. The distinction in relation to geographic market definition which we discussed earlier in the context of VHB services is that you may get variability in availability of services by customer site and there whether EFM is a relevant constraint for you or not will depend on whether you are a lower or high bandwidth user.
Q (Mr Beard)	You have excluded EFM from the OCP counts in relation to the Boundary Test and in to doing so you have neglected a significant source of in-market competitive constraints in drawing the boundaries and setting the standard for effective competition, have you not?
A (Ms Curry)	No, I disagree, because firstly in drawing the boundaries for geographic markets, although EFM was

not included in the network reach measure, it was still taken into account when variations in EFM presence were taken into account when defining geographic market boundaries: and the constraint from EFM operators in each geographic market so defined was also taken into account in Ofcom's SMP assessment within each geographic area. So I do not accept simply because it was not included in the network reach measure, that the constraint from EFM was not taken into account in either the geographic market definition or the SMP analysis stage.

Q (Mr Beard) It was taken into account at SMP but not in relation to geographic market?

A (Ms Curry) I am sorry but I think it was taken into account in geographic market definition.

Q (Mr Beard) It was not treated as a relevant contribution to the OCP count?

A (Ms Curry) It was not included in network reach but a consideration of how the constraint from EFM may vary by geography did feature in Ofcom's consideration of geographic market boundaries.[52]

387. From this evidence we take two points. First, that although Ofcom had decided to define a single product market for all CISBO services, and had included EFM in that definition, when it came to what it accepted were the most important metrics which it used to analyse competitive conditions – namely the presence of rival infrastructure – it excluded EFM services as a competitive presence, essentially on the basis that it did not regard the infrastructure used to supply EFM as comparable with the fibre optic infrastructure used to provide other CISBO services. We have considerable difficulties with that approach: (i) if EFM was, as Ofcom had concluded, part of the same single product market as other CISBO services; (ii) if, as Ofcom accepted, EFM provides a direct competitive constraint at lower bandwidths which form a significant proportion of all CISBO services; and (iii) if, as Ofcom contended, this constraint also indirectly constrains the price of VHB services.

388. The second point relates to the table at FS A10.15, to which Ms. Curry referred in her written evidence, which set out the average number of OCPs providing services at EFM exchanges by geographic area.

[52] T13/1296-1299.

Table 9: Average number of OCPs providing services at EFM exchanges, by geographic area (FS Table A10.15)

Area	Average No. of OCPs Present
CLA	2.33
LP	2.02
CBDs	1.70
RoUK (inc. CBDs)	0.70

389. The points made by Ofcom and Ms Curry – that the presence of EFM followed a similar pattern to Ofcom's geographic markets, and that there are more EFM providers in the CLA than in the other geographic areas – do not address the real issue. The issue was not whether the CLA was different from the other geographic markets: that was accepted from the outset. The issue was whether the competitive conditions were sufficiently similar in the CBDs and the RoUK to warrant defining them as a single homogeneous market. In that respect the presence of EFM could only be ignored if it was equally available everywhere in both areas. Instead, from the table it is clear that there is a very material difference in the presence of EFM providers per exchange in the CBDs (1.7) than in the RoUK (0.7 including the CBDs). On that metric the competitive constraint represented by EFM cannot be regarded as equally present in the CBDs and the RoUK.

390. Although a further point was made in evidence that the number of OCPs providing EFM at exchanges in the RoUK (0.7) included a "tail of rural exchanges where no business demand is likely", and Ms. Curry responded by asserting that if those exchanges were excluded, the average number of OCPs providing EFM in the RoUK increased from 0.7 to 1.3 per exchange, no further details were given. In the absence of significant further explanation, we are not able to assess the weight of this point.

391. Accordingly, we do not think that the treatment of EFM in the FS was correct, and it seems to us to reinforce the other errors that Ofcom made in relation to the CBDs.

392. The final point made by Ofcom concerning the CBDs – namely that it would have found SMP and imposed the same remedies in both the CBDs and the RoUK, so that it was unnecessary to define those geographical areas separately – also appears to us to be unsound as a matter of principle. It is worth recalling the sequence of analysis mandated by section 79 of the 2003 Act (see paragraph 64 above), together with para 55 of the SMP Guidance:

> "55. Once the relevant product market is identified, the next step to be undertaken is the definition of the geographical dimension of the market. It is only when the geographical dimension of the product or service market has been defined that a NRA may properly assess the conditions of effective competition therein."

393. In short, the relevant legislative framework and guidance makes clear that market definition should precede the analysis of SMP (which should in turn precede the question of remedies). In cross-examination, Ms. Curry was asked about this approach by Professor Cubbin and appeared to accept that Ofcom had reversed the process:

A (Ms Curry)	[…] I am afraid I really do not feel comfortable talking about the SMP analysis in any detail today. I am happy talk about why Ofcom did not define the central business districts as different geographic markets.
Q (Professor Cubbin)	I understood you to be saying that putting things in the same market was a matter of -- we get the same SMP result, therefore we put them into the same market.
A (Ms Curry)	Likely to, yes.
Q (Professor Cubbin)	They would be likely to?
A (Ms Curry)	Yes.
Q (Professor Cubbin)	I thought I even heard you say, "We would adopt the same remedy, therefore we had the same SMP, therefore they are in the same market." I thought I heard you say that. If I have misunderstood you, perhaps you can correct me.
A (Ms Curry)	No, you have not. At the geographic market definition stage, you have to look ahead to what you are likely to find in the SMP and remedies assessment, where you might find -- reach a different SMP conclusion or where different remedies may be appropriate. You would want to

> define them as a separate geographic market. My point was just that Ofcom had not concluded at that stage on what the SMP's assessment or appropriate remedies in those areas would be.[53]

394. Instead of rejecting the CBDs as a separate geographical area on the basis of what Ms. Curry suggested was a provisional view as to the likely findings on SMP and remedies, we consider that the correct approach would have been for Ofcom to form its view as to the appropriate geographical areas first and independently of the issues of SMP and remedies, and then to conduct its SMP and remedies assessments in respect of those separate areas.

395. In that regard it should be recalled this was not a case in which Ofcom was faced with a difficult situation in practice of trying to whittle down a prohibitively large number of geographic markets by aggregation into a manageable number (such as referred to in para 129 of the BEREC Common Position). On Ofcom's own analysis, keeping the CBDs separate (as Ofcom did when settling on the candidate areas) would simply have resulted in four geographic markets instead of three. Even if each of the five CBDs were defined as a separate geographic market, this would still result in no more than eight geographic areas in total. Instead, by placing the CBDs together in the same geographic market as the RoUK, Ofcom precluded the possibility that a different SMP finding or different remedies might be appropriate in those urban areas.

396. The points that we have made concerning Ofcom's treatment of the CBDs were reflected in the observations of the European Commission in its letter to Ofcom of 22 April 2016 commenting on Ofcom's draft statement. The Commission's comments under the heading, "*CISBO geographic market definition and remedies*" were summarised in the FS as follows:

> "4.456.1 In its comments on the draft Statement, the Commission said that it welcomed our decision to deregulate or impose lighter remedies in areas where infrastructure-based competition has developed in recent years. However, it commented that a more granular differentiation of remedies in areas where there was some actual infrastructure-based competition could

[53] T13/1267-1268.

> reduce the likelihood that CPs would reduce investment or even exit the market.
>
> 4.456.2 It considered that our approach could be developed further "in order to more accurately reflect the competitive conditions of a given area". In particular, it considered that we could develop a test, similar in concept to that used to define the boundary of the CLA, but with different parameters, which could then be used to identify other areas where the lighter remedies could be applied. It suggested that, if this were done, it might then show that areas such as the five CBDs were also suitable for lighter remedies.
>
> 4.456.3 The Commission therefore asked us to "consider…a lighter set of remedies, not only in the LP area, but also other parts of the UK territory, including the five CBDs, based on a set of clear criteria reflecting all relevant parameters of the state of infrastructure-based competition therein."”

397. In the FS, Ofcom indicated that it had considered the Commissions comments, but it did not adopt them. Ofcom set out its reasons at FS 4.456.4 to 4.456.15. The crux of Ofcom’s rationale for not adopting a more granular approach and differentiating between the CBDs and the RoUK in its definition of geographic markets was set out in the following two sub-paragraphs:

> “4.456.8 In applying our assessment of areas where lighter touch remedies may be appropriate, we continue to consider that it is not appropriate to include the CBDs. As we set out in paragraph 4.454, we find that for the CBDs, whilst network reach figures appear similar to the LP and at a level which warrants further analysis … , the available evidence points to the depth of competition being considerably lower than in the LP. For example, in paragraph 4.451, we note that in the LP 55% (85%) of VHB customer ends are within 100 (200) metres of four or more OCPs compared to 28% (64%) of VHB customer ends within CBDs. Evidence on concentration measures also points towards fewer OCPs being successful in providing services in the CBDs. In paragraph 4.451, we set out evidence on the combined share of BT and Virgin, the number of OCPs with a material service share and the HHI index, all of which show that market structures in the CBDs are highly concentrated, and much more closely aligned with the RoUK than the LP.
>
> 4.456.9 In paragraph 4.452, we consider the potential for incremental infrastructure investment in the CBDs and conclude that five small and geographically separated districts whose surrounding areas show little demand for leased lines and low network reach are likely to have limited prospects for incremental infrastructure expansion (even in the absence of any remedies). In paragraph 4.452, we also note that, although average business density is higher in the CBDs, the number of businesses and the volume of circuits in each of the individual CBDs, especially at very high bandwidths, are relatively low. In paragraph 4.454, we note that the low volume of VHB services in these areas makes it less likely that a VHB segment, on its own, could support entry of a competitor looking to supply that segment.”

398. These paragraphs amount to no more than a reiteration of Ofcom's earlier views, and we have already dealt with each of the points that Ofcom made. To repeat, we consider that when considering the similarity of competitive conditions between the CBDs and the RoUK, Ofcom wrongly interpreted its own metrics as regards the presence of infrastructure across the whole of the CISBO product market that it had defined (i.e. including EFM and not limited to VHB), that it often failed to make the correct comparison between the CBDs and the RoUK which it placed into the same geographic market, and that it erred in allowing its decision on the definition of geographic markets as regards the CBDs to be influenced by its provisional assessment of SMP and remedies.

399. For those reasons, we consider that Ofcom also erred in adhering to its approach notwithstanding the view expressed by the European Commission that it ought to adopt a more granular approach to reflect more accurately the competitive conditions in other areas of the UK, including in particular the CBDs. In doing so, Ofcom failed to take "utmost account" of the Commission's views as required by Article 7(5) FD.

400. Having considered the particular position of the CBDs we turn to consider the other geographic market definition issues identified by the parties in the List of Issues as regards the formulation and application of the Boundary Test and the Network Reach Test. We do so relatively briefly, because, as we have indicated, Ofcom accepted that if we set aside its product market definition, it would also have to revisit its decision on geographical markets. In particular, we would envisage that if, as a result of its reconsideration, Ofcom were to define the product market(s) differently, it would likely have to adjust the main criteria that drive the design of its infrastructure presence tests.

(5) Issues 6 and 7: the formulation and application of the Boundary Test and Network Reach Test

401. The basic parameters and use to which Ofcom stated that it had put the Network Reach Test and the Boundary Test were set out in paragraph 357 above. In brief, Ofcom stated that it used the Network Reach Test to identify candidate areas for further analysis whose competitive conditions appeared to differ from those in the RoUK to an extent that merited further analysis. It also stated that it used the Boundary Test to identify areas in which the extent and depth of rival infrastructure to BT enabled it to conclude, even at an initial stage and without further investigation, that an area that passed the Boundary Test was effectively competitive across the CISBO market.

402. The primary focus of BT's appeal was in relation to the design of the Boundary Test and how Ofcom had applied it. BT contended that because of the way in which the Boundary Test was designed and used, Ofcom took a decision that a geographical area could only be effectively competitive if it met the same infrastructure presence conditions as existed in the CLA, and that this was too high a test for effective competition. The essence of the challenge was that the Boundary Test was an exercise in reverse engineering, that Ofcom should have been less stringent in its selection of various parameters and in its detailed application, and that if it had been, some of the LP and/or the CBDs would have been regarded as effectively competitive and hence added to the areas in which no regulation was thought necessary.

403. The basis for BT's primary contention was an assertion that the Boundary Test had been set by reference to an area known as the CELA (the Central and East London Area) which had been found to be competitive in the 2008 BCMR on the basis of an infrastructure presence test of BT + 2 OCPs within 200m. BT contended that instead of applying these same parameters which had been found satisfactory for effective competition in 2008, Ofcom had, for no good competition reasons, simply designed a test to replicate the same CELA boundary, with the result that because the levels of infrastructure had developed over the intervening years between 2008 and 2015, the

infrastructure presence parameters needed to define that same area were substantially increased to a main requirement of BT + 5 OCPs within 100m. BT contended that specifying this level of infrastructure presence went far beyond any legitimate requirement for effective competition.

404. It does appear that the origins of the CLA were indeed rooted in the CELA from the 2008 BCMR. In paragraph 4.89 of the 2016 BCMR consultation, Ofcom explained:

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

405. The explanation in the consultation of how Ofcom then set the criteria for the Boundary Test does not indicate how Ofcom arrived at the numbers of OCPs and buffer distances, leaving open the inference that it had simply adjusted the parameters so as to describe the area of the CLA which it had already identified:

> "4.90 We now need to define the boundary of the CLA more precisely. As noted before, we define the boundaries based on the degree of presence and depth of coverage of rival infrastructure. If we can identify an area where competition is effective and no CP has SMP in the market for CISBO services, we can deregulate it fully. For that reason, we define boundaries of the CLA using a set of appropriate criteria ensuring that the resulting area has sufficient level of competition to protect users of CISBO services against the exercise of market power. This requires most if not all (potential) users of CISBO users to have a number of OCPs with network sufficiently close to their sites for them to be willing and able to compete for supply of CISBO services to these sites.
>
> 4.91 First we identify those postcode sectors in which competition is likely to be fully effective across a range of products as a separate market, which we call the Central London Area (CLA) To identify the boundary of this market we have created a "Boundary Test". The boundary of the CLA geographic market is formed by postcode sectors which fulfil at least one of the conditions of the Boundary Test:
>
> - postcode sectors where businesses have on average five or more OCPs within a buffer distance of 100m;
>
> - in addition, postcode sectors where businesses have on average four or more OCPs within 100m and in addition, 90% of the businesses are within 100m of at least two OCPs."

406. BT wished to cross-examine Ms. Curry as to the linkage between the CELA as defined in the 2008 BCMR and the CLA as defined in the 2016 BCMR and to put to her the point that the Boundary Test parameters had been chosen as an exercise in reverse engineering rather than as a result of any proper analysis of what was required for effective competition in 2016. However, at the outset of this section of her cross-examination, Ms. Curry made clear that she had not been involved in the BCMR 2016 "project" at the time of the design of the Boundary Test and did not feel comfortable answering questions on the analysis set out in the BCMR 2016 – still less on any connection with the 2008 BCMR. This led to the following exchange:

> **(Mr Beard)** I had a whole series of questions in relation to this 2008, 2015, consultation and the issues linking it to the 2008 definition. There is no point in me asking those questions.
>
> **(Ms Curry)** My understanding of the role of the Boundary Test is as set out in my witness statement.
>
> **Q (The Chair)** Is it right that you would feel either unable or uncomfortable answering questions about the linkage between the 2008 consultation that we have just been --
>
> **A (Ms Curry)** I have never looked at 2008 consultation, and any relationship between the CELA and the CLA has never been mentioned to me by my colleagues who handed this project over to me. It is not my understanding of the purpose of the Boundary Test.[54]

407. In fact, Ms. Curry's written statement had contained an extensive passage on the design of the Boundary Test in the BCMR 2016, which included the following:

> "426. Thus in the context of CISBO services, it is appropriate to assume that effective competition in a particular area is likely to require that most users in that area have a sufficient number of OCPs bidding to supply them that there will be effective competition to these sites.
>
> 427. However, Ofcom is not able to observe the actual number of OCPs who would bid to supply an individual site (FS §§4.363 – 4.365). Instead, it observes how many OCPs have infrastructure within a given distance of the customer site. This is an important distinction because it means that the criteria set out in the Boundary Test do not reflect Ofcom's view on the minimum number of competitors needed for effective competition. Instead, they constitute Ofcom's view on the minimum level of network reach needed to consider (before taking into account other relevant factors and undertaking a full SMP assessment) that competition is likely to be effective in that area.

[54] T13/1276.

428. The distinction arises because network reach figures do not measure the number of OCPs who exercise a significant constraint on BT's pricing at a particular customer site: they measure the number of OCPs with infrastructure within a given buffer distance. This is likely to overstate actual availability for many customers within the area because:

(i) *Dig distances vary considerably, and not all OCPs will be able to submit a competitive bid if they dig the full buffer distance for all customers.* The variability in dig distances set out above suggests that not all CPs will be able to submit a competitive bid if they dig as far as 100m for every contract. The buffer distances Ofcom chose reflected the evidence it had seen on average and median dig distances, and are consistent with the range of the submissions it received from infrastructure providers. However, the distance a CP is willing to dig in practice will vary considerably from site to site, reflecting factors such as contract value and length, the number of other potential users on the site and differences in dig costs (e.g. due to the presence of roads or other obstacles) and where in practice a CP is able to dig from its own network. The greater the number of CPs within the specified buffer distance, the more likely that some will be significantly closer to customers and hence more willing and able to compete to supply a customer (FS §4.369).

(ii) *OCPs have different business models and aren't always prepared to supply all customers' needs.* CPs have different business models and customers have different needs. As a result, not all CPs, other than BT, will be well-placed to supply all customers and may not bid for a given contract as a result. (FS §4.370)

(iii) *Network Reach figures are averaged over all business sites in the area, so will include some sites with fewer than the average number of OCPs within the buffer distance*. The average network reach statistics for a given area may mask differences in network reach at different individual sites, or for different customers, within that area. The larger the area, the more likely it is that the average degree of choice available to customers within it will not be representative of the actual choice available to customers in parts of that area where network coverage is less dense and there are more gaps in coverage (FS §4.368).

(iv) *Some customers require multiple suppliers for resilience*. An additional consideration is the fact that, as a material proportion of users contract with multiple suppliers for resilience reasons (see Senensieb 1 §§65 - 66), this increases the number of CPs needed to ensure that the majority of users in a given area have effective competition to BT. Customers may want multiple providers for resilience reasons (e.g. the 2015 BDRC survey found 25% of businesses surveyed use more than one supplier, and that resilience was the second most important feature when choosing a service provider (after availability)). These users will require a greater number of bidders in addition to BT to be able to exercise choice between providers effectively and, given the variability in dig distances and business models mentioned above, a user may need significantly more providers with network within 100m in order to receive this minimum number of bids (FS §4.371).

> 429. Taking these factors in the round, Ofcom considered the Boundary Test criteria were likely to ensure that most customers in an area would have a sufficient choice of provider."

408. Since these paragraphs simply paraphrased the Final Statement, it would appear that Ms. Curry did not have any information or direct evidence concerning the design of the Boundary Test to add to the statements in the Final Statement.

409. Moreover, given Ms. Curry's reluctance to answer questions on the design of the Boundary Test, we think that it is surprising that her written evidence went on to express the following opinion:

> "430. Ofcom's assessment of the level of network reach required for an area to be considered likely to be effectively competitive, on the basis of that measure alone, was a qualitative assessment of a very complex relationship that necessarily involved a degree of judgment. However, I consider the Boundary Test to be a reasonable and proportionate basis for identifying candidate areas that were likely to be effectively competitive."

410. As it was, we heard a good deal of evidence and expert evidence from other witnesses dealing with the type of considerations that ought to have gone into any proper assessment by Ofcom of the requirements for effective competition in 2016, including, for example, evidence as to the extent to which the specified number of OCPs within a buffer distance would be likely to exceed the number who might actually bid, and as to the willingness of OCPs to dig larger or smaller distances to win contracts in different sectors of the CISBO market.

411. At the end, however, although we were inclined to the view that BT had not made out its case that Ofcom had erred in its selection of the main parameters that went into the Boundary Test (Issues 6.1-6.3), we were left with a real sense of unease given that the account from Ofcom of the design process was incomplete and BT had been unable to cross-examine any person from Ofcom with direct knowledge of the process.

412. In addition, although we accept Ofcom's submission that the design of a suitable proxy to test competitive conditions in an area raises questions of regulatory judgement and discretion to which the principles to which we

referred in paragraphs 70 to 81 above would apply, we cannot be sure of the result of applying that approach in the instant case. As the extract from *British Sky Broadcasting Ltd and ors v Ofcom* [2012] CAT 20 at [84] makes clear, on an appeal "on the merits", the Tribunal would ordinarily be prepared to give due weight to the experience of the regulator and would take into account the "duration and intensity" of the investigation which it had performed when deciding how much latitude to give to the regulator on questions of judgment. However, the incomplete state of the evidence as regards the process that went into the design of the Boundary Test means that we cannot assess the adequacy of the investigation performed by Ofcom in this case.

413. We would also make a similar point in relation to a related criticism by BT (and others) of the way in which Ofcom had used the Boundary Test. BT contended that having defined the Boundary Test so as to replicate the competitive conditions in the CLA, Ofcom then took the view that no other area in the UK could be effectively competitive unless it also met the Boundary Test. In other words, so BT contended, passing the Boundary Test became a necessary pre-requisite before any other geographic area could be considered for deregulation.

414. That contention was supported, for example, by reference to the following statement in FS 4.327-4.328, which appeared, at least initially, to deal with the process adopted by Ofcom <u>after</u> using the Boundary Test to identify the CLA and the Network Reach Test to identify the LP and CBDs as distinct from the RoUK:

> "4.327 Having identified these four geographic areas to focus on, we considered four indicators of competitive conditions:
>
> - The presence of rival infrastructure;
> - The distribution of service shares;
> - Pricing and profits; and
> - Other structural indicators of competition, including the scale and density of demand, the types of business present, and the extent of links to more competitive areas elsewhere.
>
> 4.328 We placed most weight on the presence of rival infrastructure. Our assessment of this 'presence' indicator considered differences in the

> proximity of infrastructure to businesses in each area; the number of rival networks; and their coverage. We considered that areas where the average business had two or more OCPs' networks within 200m had greater potential for competition than other areas. We used this metric as a way of identifying areas where competitive conditions appear to differ from the RoUK, at least to an extent that merits further analysis. **However, we considered that areas were unlikely to be effectively competitive unless they satisfied the more stringent criteria used to define the CLA boundary.**"
>
> (Emphasis added.)

415. We certainly accept that there seems to be some confusion in the drafting of these two paragraphs. For the most part FS 4.328 seems to be dealing with the process before the steps described in FS 4.327. But the last sentence of FS 4.328 does not appear to be addressing the question of defining the CLA itself as an area of effective competition. Instead it seems to be directed at the question of whether other areas outside the CLA met the CLA criteria, as a prerequisite for a finding of effective competition in those other areas.

416. Ms. Curry did not, however, accept that this was a fair reading of this paragraph:

> **Q (Mr Beard)** What is being said here in that final sentence is,
>
> "Well, we did look at other things but we did not consider an area was likely to be effectively competitive unless it met those stringent criteria for the boundary test."
>
> That is what is being said, is it not?
>
> **A (Ms Curry)** […] I do not think this goes to the role that the Boundary Test played in either defining geographic markets or ultimately in Ofcom's SMP assessment. I think it is in slightly loose drafting. In other places in the final statement, which we have seen already today, Ofcom was clearer that it used the Boundary Test to identify areas which were most likely to be effectively competitive on the basis of these threshold measures of network reach alone. It none the less identified these other candidate areas, the London Periphery and the Central Business Districts, for further investigation as to whether they should be defined as distinct geographic markets and the Boundary Test played no role in that consideration.[55]

[55] T13/1288-1289.

417. The difficulty with that evidence is that whilst it is apparent that Ofcom did look at other factors for the purpose of ascertaining whether competitive conditions in the other candidate areas were sufficiently similar or dissimilar to justify defining those areas separately, a number of other statements in the FS did seem to indicate that Ofcom indeed took the view that passing the Boundary Test was necessary before an area could be considered effectively competitive. So, for example, having made the point in FS 4.400 that the Network Reach Test was not used to identify fully competitive geographic markets, Ofcom continued:

> "4.401 We have nevertheless placed significant weight on CP presence, and think that our Boundary Test is appropriate to identify the areas likely to be the most competitive. BT and IIG suggest that the number of competitors needed for effective competition is lower, with the implication that the Boundary Test is not needed to identify an area as effectively competitive. To support their views on the number of competitors needed for effective competition, BT and IIG referred to various studies. The main inference that BT and IIG draw from these studies is that three competitors (including BT) is enough.
>
> 4.402 We consider that our Boundary Test captures the reality of BCMR markets whereby the proximity of a rival CP with infrastructure to a particular business site does not always mean that the CP will compete for that user. As discussed in paragraphs 4.359 to 4.374 above, for leased lines markets, we think that a given number of OCPs with 'presence' will likely translate into a smaller number of competitive retail offers at the customer site. Our Boundary Test, therefore, provides a reasonable basis to capture these uncertainties […]."

418. Against this rather confused factual background, and again, conscious that Ofcom may well be reconsidering its geographic markets definition, we prefer not to express a concluded view on this point.

419. Suffice to say, however, that if it were to transpire that the Boundary Test had simply been fixed to define the CLA boundary by reference to the historic CELA boundary, rather than as a result of some appropriate review of the requirements for effective competition in 2016, it would obviously not have been correct for Ofcom simply to conclude that no other area in the UK could be effectively competitive unless it was as competitive as the CLA.

420. Notwithstanding the overall uncertainties regarding the origins and design of the Boundary Test, we can indicate that we would reject a number of the specific points raised by BT in that regard.

421. We did not consider that BT had established that Ofcom erred in its test for identification of the large business sites that might want CISBO services (issue 6.4). We recognize that there is no perfect solution to what is necessarily an approximation designed to provide a proxy for actual competitive conditions, and we did not consider that Mr. Beal's suggested alternative provided any obviously better answer.

422. Nor did we think that Ofcom erred in excluding microwave solutions in its Network Reach or Boundary Tests (Issue 6.5(i)). Microwave was excluded from Ofcom's definition of the CISBO product market. By parity of reasoning with EFM (which was included by Ofcom in the product market and should, we think, have been taken into account in the Network Reach and Boundary Tests), we do not think that Ofcom can be said to have erred in excluding microwave from its geographic market analysis.

423. BT also criticized Ofcom for its use of postcode sectors (of which there are over 10,000 in the UK) rather than individual postcodes (of which there are about 1.7 million) as the geographical unit of analysis (Issue 6.6). BT's main complaint appeared to be that by choosing the larger area of the postcode sector, Ofcom had allowed individual postcodes that might have passed the Boundary Test to be outweighed by others in the postcode sector that did not, and hence that variations in competitive conditions had been obscured.

424. We accept Ofcom's submission that its approach was an appropriate approach for a regulator to take. It is clear from paras 86-91 and 128-129 of the BEREC Common Position that that there is no need for competitive conditions to be perfectly homogeneous across all geographic areas and that practicality is an important consideration when conducting a geographic market analysis. In particular, para 86(d) of that guidance indicates that the distinct geographic units should be:

> "Small enough for competitive conditions to be unlikely to vary significantly within the unit but at the same time large enough that the burden on operators and NRAs with regard to data delivery and analysis is reasonable."

425. Against that background, we do not think that it was obviously wrong for Ofcom to perform its infrastructure and other analyses by reference to postcode sectors, which are clearly defined areas of which there are a significant number in the UK (10,000 +). There would be a significantly increased burden of having to conduct a similar data gathering and analysis in relation to over 100 times that number of areas, and we have no evidence that a materially better or different analysis would be the result.

426. We also reject BT's contention that Ofcom erred in assuming for the purpose of its analysis that businesses were all located at the centre of each postcode sector. Some assumptions clearly need to be made and we cannot see how that necessary approximation would have produced any bias in Ofcom's analysis.

427. The final issue in relation to geographic markets was a contention by BT that Ofcom failed to conduct a proper sensitivity analysis by flexing multiple parameters cumulatively (Issue 7). Ofcom's reponse was that although there may be cases where it would be helpful to flex multiple parameters together, in the present case it was not appropriate, in particular because the various parameters are not independent.

428. This point was developed in Ms. Curry's written evidence:

> "[…] I do not consider it appropriate to relax multiple assumptions in the manner [Dr Basalisco] suggests (e.g. considering the cumulative impact of a longer buffer distance and fewer OCPs) as the appropriate value for the parameters concerned are linked to values assumed for others. For example, as noted in the FS §4.367, 'the longer the buffer distance specified the more likely it becomes that measures of the number of OCPs within that distance overstate actual choice for most consumers.' As a result, relaxing one assumption (e.g. by setting a longer buffer distance) would be likely to call for a stricter requirement on the number of OCPs needed within that distance.
>
> It is also not clear what would be gained from changing multiple assumptions simultaneously. The purpose of Ofcom's sensitivity testing was to see if the CLA boundary was particularly sensitive to any of the assumptions underlying its analysis. The fact that the boundary changed somewhat with a change in assumptions is to be expected, but the key point was that it did not change significantly. Changing more assumptions at once would have likely

> resulted in a larger change to the CLA boundary but it is not clear what this would have added to Ofcom's analysis."

429. We heard very little evidence on this point, and in the end we are not persuaded that Ofcom erred in its approach in this respect.

430. Finally, we cannot leave the issue of geographic market definition without specifically raising a point that links a number of the complaints made and to which we have briefly referred in paragraph 378 above.

431. Although we have rejected BT's challenge to Ofcom's use of postcode sectors as the unit for geographical analysis, we do consider that there are obvious dangers in the use of very large areas for geographic markets analysis. In particular, although Ofcom was plainly entitled to use the Network Reach Test to select broad areas consisting of many postcode sectors for further investigation, it does not follow that the candidate areas are set in stone so that the further investigation of competitive conditions cannot or should not take place on a more granular level within those areas. It would, for example, obviously be wrong to assume that because the wider area as a whole did not meet the Boundary Test (however that was defined), then no smaller part of that area could be considered effectively competitive. That approach would risk postcode sectors which did pass the Boundary Test being treated as having similar competitive conditions to the remaining sectors that (*ex hypothesi*) did not pass the Boundary Test.

432. Specifically, whilst we are aware that Ofcom decided that some small pockets of postcode sectors that did pass the Network Reach Test in the RoUK could not be treated as separate geographical areas on account of their scale and their geographical isolation (see Ofcom's opening remarks set out in paragraph 358 above), it is not clear whether, and if so, why a similar approach was applied to the postcode sectors that passed the more stringent Boundary Test and which were located in the middle of each of the CBDs. The numbers of such postcode sectors varied between CBDs as shown in Table A10.59 in the Final Statement, but included, for example, 11 postcode sectors in central Manchester containing 244 businesses and 713 CISBO lines, and 5 postcode sectors in Glasgow containing 218 businesses and 650 CISBO lines. Given

that Ofcom had defined a single product market for all CISBO services and was content to deregulate the CLA in London as effectively competitive, we remained unclear at the end of the hearing (and were unable to find any explanation in the Final Statement) why Ofcom did not think that the same approach should not also be applicable to those postcode sectors in the centre of at least some of the CBDs which also passed the Boundary Test.

(6) Conclusion on geographic market definition

433. For the reasons set out above, and independently of its findings in relation to product market definition, we find that Ofcom erred in its definition of the geographic market for CISBO services in that, on its own metrics, Ofcom was wrong to find that the RoUK comprises a single geographic market including the CBDs, and in doing so it failed to take utmost account of the comments of the European Commission.

434. Consequently, the Tribunal quashes Ofcom's decision on geographic market and remits it for reconsideration.

H. COMPETITIVE CORE

(1) Issue 8: Introduction

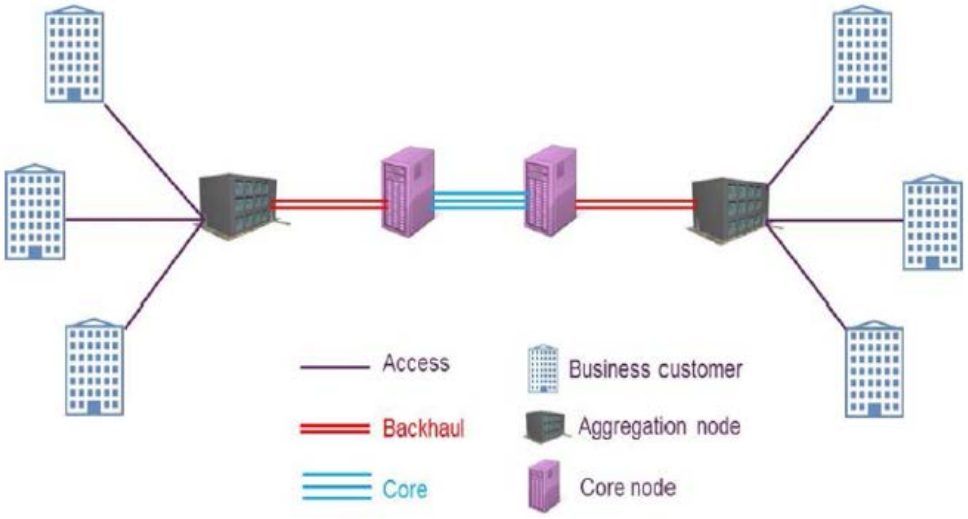
435. Issue 8 concerns whether Ofcom erred in its determination of the boundary between the competitive core segments and the terminating segments of BT's network. The issue is worded as follows:

> Issue 8: Whether Ofcom has arbitrarily and without proper justification departed from its consultation methodology for assessing competitive core conveyance.

(2) Background

436. The core network consists of the lines which link up the terminating CISBO segments. Its distinguishing feature is that it is competitive – it is in effect a central network of wholesale leased lines which is carved out of the three geographic markets because of its distinctive competitive conditions. In conceptual terms the core network is illustrated in the diagram below.

Figure 10: Illustrative example of network segments



437. In the BCMR 2013 BT's core network was delineated by identifying the points on BT's network between which competing CPs could reasonably be expected to offer a rival core/backhaul service. Ofcom identified 85 major

nodes on BT's network. These were a subset of BT's nationwide 107 Openreach Handover Points ("**OHPs**"). Ofcom recognised that BT's competitors would be unlikely to connect to each and every one of these major nodes because some were located comparatively close together. Nevertheless, rival CPs would be likely to connect to at least one node at each relevant cluster of nodes.[56] Ofcom therefore decided to group the 85 major nodes into 56 Trunk Aggregation Nodes ("**TANs**"). Ofcom found that core/backhaul conveyance between TANs was competitive and constituted "core" conveyance, but that conveyance within each TAN was not competitive and therefore fell outside of the "core".

438. In the BCMR 2016, Ofcom considered that the existing core network remained competitive. However, Ofcom decided to consult upon whether the competitive core network had expanded since the BCMR 2013.

439. Ofcom's view, as expressed in the FS, was that an exchange can be considered effectively competitive if there are at least two potentially available rival backhaul services to that of BT:

> "A15.78 We consider that an exchange will be effectively competitive where there is a sufficient degree of interconnection for CPs not to be reliant on BT for backhaul services. As some CPs will need to contract with multiple providers to obtain a resilient solution, this requires that a minimum of two rival backhaul services should be potentially available for an exchange to be found competitive."

440. Obviously, not every CP has a sufficiently extensive network infrastructure to be able to offer core/backhaul services that can compete with BT. Ofcom therefore identified a number of CPs which it considered had substantial core infrastructure which could rival BT (referred to as **"Principal Core Operators**" or **"PCOs"**).[57] For the purposes of the consultation Ofcom identified such PCOs as being 'present' at an exchange if those PCOs purchased Cablelink, a BT interconnect product which is used to hand over

[56] The CP in question might connect to only one of the nodes in the cluster and use BT's network to aggregate traffic from the other nodes to that node before conveying that traffic onward over its own network.
[57] The PCOs are Vodafone, Virgin Media, Colt, Gamma, Interoute, KCOM, Level 3, Neos and Zayo (FS footnote 574).

circuits purchased from BT (e.g. CISBO services), and if the PCO in question had its own network infrastructure within 200m of the relevant BT exchange.

441. Ofcom then set out for consultation its preliminary view that there were 96 additional exchanges where it understood two or more PCOs were present (i.e. offering rival core/backhaul) and its preliminary view that these exchanges should now be considered as forming part of an expanded competitive core. Ofcom referred to these exchanges as the Candidate Competitive Exchanges (**"CCEs"**). It also proposed that the new CCEs would be grouped into 18 new TANs.

442. For the purposes of this appeal, there were two responses to the consultation of relevance:

(1) BT pointed out one of Ofcom's two chosen elements for establishing presence – namely the purchase of Cablelink by the PCO – was likely to underestimate competition at the exchanges. BT pointed out that non-infrastructure owning CPs such as TalkTalk and Sky could purchase Cablelink but then use one of BT's rival PCO networks for core/backhaul from that exchange. In such situations, the PCO might be considered 'indirectly' present at the exchange. BT argued that the competitive core should be extended to exchanges where two or more rival PCOs were directly *or indirectly* present. There are 407 such exchanges ("**BT+2 PCOs directly or indirectly present**").

(2) Six Degrees, a CP, indicated that its experience was that some PCOs had connected to a number of exchanges solely for their internal backhaul purposes and were not able to provide competitive backhaul for other CPs. Six Degrees therefore suggested that: "it is important to verify that where alternative CPs have connected to a site they are able to provide competitive backhaul services […]".

443. Ofcom agreed with BT that indirect presence of a PCO at an exchange would constitute a relevant competitive constraint, but it considered that such indirect presence would impose a weaker constraining effect compared to a direct

presence (FS A15.71-A15.77). In passing, we note that this conclusion was the subject of some criticism by BT through the evidence of Mr Beal. These criticisms were addressed by Ms Curry.[58] The challenge to this finding was not seriously pursued by BT in either its written or oral closing submissions. Our view is that this was a finding which was well reasoned and clearly within the scope of Ofcom's reasonable judgement.

444. At FS A15.81, Ofcom considered the point raised by Six Degrees and commented:

> "[…] given some stakeholders' comments about potential limitations on PCOs' ability to provide a rival backhaul service (such as capacity constraints) we think an absence of supply to third-parties may be more of a concern, as it could indicate that the connection in question cannot be used to provide a rival backhaul service to BT."

445. Ofcom went on to reach the following view:

> "A15.82 In light of both stakeholder comments and our own assessment of the potentially weaker constraint from indirect PCO presence, we consider that the number of rival backhaul services available at a particular exchange may not follow directly from the number of PCOs connected (directly or indirectly) to that exchange. **Instead, the number of PCOs present could overstate the number of rival backhaul services available in a material proportion of cases.** As a result, we consider that using a threshold of two PCOs to identify effectively competitive exchanges could result in extending the CI core too widely."
>
> (Emphasis added.)

446. Ofcom went on to investigate how reliant purchasers of core/backhaul would be on BT by comparing : (i) reliance on BT at the 407 exchanges with BT+2 PCOs directly or indirectly present; and (ii) reliance on BT at the 34 exchanges where there were three PCOs directly or indirectly present ("**BT+3 PCOs directly or indirectly present**"). Ofcom found that Sky and TalkTalk relied upon BT for circuits at […]% [✂] and […]% [✂] respectively of the exchanges with BT+2 PCOs directly or indirectly present, but were reliant upon BT at […]% [✂] and […]% [✂] respectively of the exchanges with BT+3 PCOs directly or indirectly present. Ofcom also found that BT was the only supplier of circuits to both Sky and Talk Talk at […]% [✂] of the 407

[58] Curry 1, §§598ff.

exchanges with BT+2 PCOs directly or indirectly present, and the only supplier of circuits at […]% [✂] of the 34 exchanges with BT+3 PCOs directly or indirectly present.

447. From this Ofcom concluded (at FS A15.91) – but without further explanation - that a criterion based upon BT+2 PCOs directly or indirectly present would be likely to overstate the extent of the competitive core.

448. Ofcom then examined the number of PCOs present in the existing core to see whether this might provide a guide as to an appropriate choice of threshold: FS A15.92. Ofcom stated, at A15.93:

> "We found that, typically, there were only two PCOs (in addition to BT) present at OHPs but three at TANs. This contrasts to one PCO, typically, across all exchanges. This analysis suggests that an exchange where three PCOs are present is likely to have competitive conditions which are similar to a typical TAN in the existing CI core and, as the CI core definition is based on TANs is therefore likely to be effectively competitive."

449. Ofcom also considered proximity of exchanges to concentrations of business sites as an indicator of competitive conditions on the basis that the most competitive exchanges would be expected to be located in the main areas where businesses are located (FS A15.94). Ofcom found that the 34 BT+3 PCOs directly or indirectly present exchanges had a business concentration profile much closer to that of the existing core exchanges than the 407 BT+2 PCOs directly or indirectly present exchanges (FS A15.96).

450. Ofcom concluded:

> "A15.97 Overall, we consider the evidence suggests that identifying competitive exchanges based on the presence (direct or indirect) of two PCOs in addition to BT would be likely to result in extending the competitive CI core too widely. This is because there are reasons to believe there would not always be two rival backhaul services in these exchanges, and competitive indicators suggest the exchanges identified by this threshold still have a high degree of reliance on BT and appear markedly different from the existing CI core.
>
> A15.98 In contrast, exchanges where there are at least three PCOs present show a lower degree of reliance on BT and appear more similar to the existing competitive core in relation to a number of key indicators. In light of this, we conclude it is not necessary to set the threshold higher still, and

> consider exchanges identified by applying a criterion of three PCOs (in addition to BT) are likely to be effectively competitive."

451. Ofcom referred to the 34 BT+3 PCOs directly or indirectly present exchanges as the new competitive exchanges ("**NCEs**"). Ofcom went on to decide that it was not necessary to group the NCEs into new TANs (FS A15.108).

(3) BT's case

452. BT contended in its Notice of Appeal that Ofcom's decision to increase the proposed threshold from BT+2 PCOs directly present, to BT+3 PCOs directly or indirectly present was "an arbitrary departure from Ofcom's consultation methodology" which risked a material understatement of the extent of the competitive core.

453. The focus of BT's case during the hearing and in closings was that Ofcom lacked any real evidence to support, and did not actually investigate, the point made by Six Degrees; and that it did not seek to assess the competitive conditions at the initially identified 96 CCEs or to cross-check them with the existing core network. BT submitted that Ofcom's decision to abandon its suggested requirement of BT+2 PCOs directly present in favour of a requirement of BT+3 PCOs directly or indirectly present was unjustified. It also suggested that there was the possibility that some of the existing, admittedly competitive core, would not pass the new threshold. BT requested the Tribunal to quash Ofcom's finding and remit to Ofcom for reconsideration the question of whether at least the 96 CCEs should be added to the competitive core.

(4) Analysis

454. We accept BT's observation that, of itself, the Six Degrees' response was inadequate for Ofcom to form any reliable view as to the extent to which the direct presence of a PCO at an exchange might overstate competitive conditions because of the possibility that the PCO might be using the connection for internal backhaul purposes only.

455. Six Degrees suggested that "it is important to verify" that a PCO which was directly present at an exchange was prepared to supply third parties and/or was not constrained by lack of capacity from doing so. However, Ofcom did not perform any such verification exercise in relation to the 96 CCEs, or indeed in relation to the existing core which it was satisfied was competitive. Nor did Ofcom suggest that it would have been impractical or disproportionate simply to ask the PCOs present at the relevant CCEs whether they were present for internal backhaul purposes only or were capacity constrained so as to be unable to offer services to third parties.

456. Instead, at FS A15.82, Ofcom simply appears to have concluded, without more analysis, that "the number of PCOs present could overstate the number of rival backhaul services available *in a material proportion of cases*" (our emphasis).

457. That omission to inquire, and what appears to have been Ofcom's ready assumption as to the materiality of the point identified by Six Degrees, can be put into context when it is appreciated that there were at least 311 (i.e. 407-96) of the exchanges at which BT+2 PCOs were directly or indirectly present where the PCO was willing to supply services to third parties.

458. These points were illustrated by the following exchange in the cross-examination of Ms. Curry:

Q (Mr Beard)	[…] It is right, I do not think it is disputed, that if you used the BT Plus 2 direct or indirect connection test, you identify 407 competitive exchanges within the core. I believe that is correct?
A (Ms Curry)	Yes, I think that is right.
Q (Mr Beard)	And what this suggests is that there are 311 exchanges where there is at least one indirect interconnection, and I get that figure by taking away 96, which was the number of competitive exchanges identified by BT Plus 2 direct connection, and the 407. That makes sense, does it not?
A (Ms Curry)	I think it does, yes.
Q (Mr Beard)	So what that means is that if there is at least one indirect interconnection at those 311 BT exchanges, someone is selling on a direct connection to another party. That is right, is it not?
A (Ms Curry)	In relation to any number of services, yes.
Q (Mr Beard)	It is possible that others within the 96 are actually

subject to indirect connection as well as direct connection?

A (Ms Curry) It is possible, yes.

Q (Mr Beard) Now, underlying the 2015 consultation is an assumption that direct presence would have an ability and incentive to provide a rival backhaul service. Ofcom identified two reasons why that assumption might not be correct. The first was a reason given by a CP which was that not all PCOs that are present would supply third parties. But what we are seeing in relation to 311 exchanges, and possibly members of the 96, is that at least at those exchanges there is a willingness to sell to someone else, is there not?

A (Ms Curry) But not necessarily in the provision of core for services for this market.

Q (Mr Beard) But you do not have any evidence about that, do you?

A (Ms Curry) No, I suppose not.[59]

459. Moreover, because Ofcom did not consider the competitive conditions at the 96 initially identified CCEs with BT+2 PCOs directly present, but only assessed competitive conditions at those exchanges together with the 311 exchanges which had BT+2 PCOs directly or indirectly present, there is a material risk that the true extent of the competitive conditions at the CCEs has been swamped by less competitive conditions at the other exchanges. That is because it is common ground that an 'indirect' presence creates a lesser competitive constraint than 'direct' presence, so that one would naturally expect the conditions at the larger number (311) of exchanges with at least one indirectly present PCO to be less competitive than at the smaller number (96) with both PCOs directly present.

460. We do not think that the cross-check that Ofcom conducted against the existing core in FS A15.93 provides any comfort in this respect. We have set out that paragraph above, but for convenience we repeat it:

> "A15.93 We found that, typically, there were only two PCOs (in addition to BT) present at OHPs but three at TANs. This contrasts to one PCO, typically, across all exchanges. This analysis suggests that an exchange where three PCOs are present is likely to have competitive conditions which are similar to a typical TAN in the existing CI core and, as the CI core definition is based on TANs, is therefore likely to be effectively competitive."

[59] T13/1299-1300.

461. The meaning of this paragraph is unclear in several respects – not least because it is not always apparent whether it is referring to PCOs present directly or indirectly. Moreover, it is unclear to us why the comparison has been drawn between each of the 407 new candidate exchanges and the 56 TANs in the existing core. TANs will comprise more than a single exchange and can therefore be expected to have a greater number of PCOs present. The more obvious like-for-like comparison, which does not appear to have been done, would be between the 56 TANs in the existing core and the 18 TANs into which the 96 CCEs were to be grouped.

462. In our view, in rejecting the 96 CCEs and imposing a higher requirement with the result that only 34 NCEs qualified to expand the existing core, Ofcom erred in: (i) placing undue reliance upon the response from Six Degrees, (ii) failing to investigate how reliant other CPs were on BT at those 96 CCEs compared to exchanges at the existing core; (iii) failing to investigate the business concentration profile of those 96 CCEs compared to the existing core; and (iv) not comparing like-with-like when comparing the characteristics of the CCEs with the TANs in the existing core.

463. These errors are material, because Ofcom's failure to investigate may mean that a significant number of circuits will continue under regulation despite being effectively competitive. It also raises the possibility that, illogically, some of the exchanges in the existing core that Ofcom deem to be effectively competitive would fail to qualify as competitive under the new test.

464. We cannot, however, determine for ourselves whether the 96 CCEs are sufficiently competitive to form part of any expanded core, and hence we consider it appropriate to quash this finding and remit it to Ofcom for reconsideration.

I. CONCLUSION

(1) Summary of the Tribunal's findings

(a) Product Market: Issues 1 to 3

465. In its Final Statement Ofcom determined that a single product market existed for all CISBO products from 10M to 100G, finding that those products were all linked by a so-called 'chain of substitution'. In particular, Ofcom found that there was no 'break' in the chain of substitution between 1G and 10G. Pivotal to this determination was Ofcom's conclusion (albeit implied rather than express) that a SSNIP by a hypothetical monopolist at both 1G and 10G would be unprofitable.

466. Under issue 1, BT argued that Ofcom had erred in failing to undertake a 'quantitative' SSNIP analysis in this case (i.e. conducting a SSNIP having regard to the regulated prices for 1GB and VHB services). In section F(2) we concluded that a NRA can, in appropriate circumstances, rely on qualitative evidence alone when conducting a SSNIP analysis and therefore Ofcom could not be said to have erred *in principle* in not conducting a "quantitative" SSNIP analysis. We considered that the real questions were whether *on the facts of this appeal*, the SSNIP analyses which Ofcom conducted at 1G and 10G were flawed.

467. Under issues 2 and 3, BT argued that Ofcom had erred in finding that a SSNIP at 1G and 10G (respectively) would be unprofitable. Our analysis proceeded as follows:

(1) We first considered Ofcom's analysis of what it said was "compelling" direct evidence of price interactions between 1G and 10G, namely (i) BT's internal documents which concerned the launch of its 10G EAD product, and (ii) Ofcom's pricing discussions with six CPs. We concluded in sections F(4) and F(5) that these sources of evidence did not support Ofcom's contention that there was strong pricing

interaction or pricing interdependence between 1G and 10G EAD services.

(2) We went on to consider a number of other categories of evidence relied on by Ofcom. In section F(7)(b) we concluded that Ofcom's reliance on VM's pricing of its 1G WDM service as evidence that there are services which "span the gap" between 1G and 10G was unsound. However, in relation to the remaining categories of evidence we did not consider that BT had shown that Ofcom had erred in finding that:

(i) users of 1G lines exhibit a material (albeit not a high) degree of price sensitivity;

(ii) users "at the margin" with demand currently at (or soon approaching) the limit of a single 1G circuit would have a "finely balanced" decision as regards migrating to VHB;

(iii) users of 1G will migrate to VHB in substantial numbers during the BCMR review period; and

(iv) users will not be materially deterred from upgrading to VHB by switching costs.

(3) We went on to consider Ofcom's 1G SSNIP analysis in section F(11). In particular, we considered whether, notwithstanding the errors we had identified, the remaining aspects of Ofcom's analysis were sufficient to support the decision that a 1G SSNIP would be unprofitable. In the Final Statement Ofcom had relied upon evidence supplied to it by BT that a material proportion of links (20%) would be 'marginal' in the sense that they would be likely to be highly sensitive to small changes in the relative prices of 1G and 10G services. However, in new evidence presented in the appeal proceedings it became clear that the true figure of such marginal lines was far less than 20%. In fact, on the basis of the true figure, even if all marginal 1G lines were to be switched to 10G there would still be a shortfall in

the number of 'switchers' needed to render the 1G SSNIP unprofitable. Thus the SSNIP would only be unprofitable if a sufficient number of non-marginal users with demand less than 1G would also switch from a 1G line to a 10G line as a result of the 1G SSNIP. But there was no analysis by Ofcom as to what fraction of these non-marginal users would switch in response to a 1G SSNIP, and the TCO analysis indicated that the fraction would be likely to be very small. We therefore concluded that Ofcom's analysis that a 1G SSNIP would be unprofitable could not stand.

(4) We next considered Ofcom's 10G SSNIP analysis in section F(12). In the Final Statement Ofcom had relied on survey evidence to suggest that there were reasons to believe that existing 10G customers might switch to 1G in response to a SSNIP at 10G. In the appeal proceedings, Ofcom accepted that switching down would be "rare", and so to that extent we consider that Ofcom erred in its analysis of the 10G SSNIP. However, Ofcom contended that there was an alternative basis for upholding its finding in relation to the 10G SSNIP. Ofcom relied on evidence and argument that sufficient numbers of anticipated new users, due to start using 10G in the relevant period, would refrain from doing so if faced by an increase in the price of a 10G service, so that a 10G SSNIP would be unprofitable. However, this alternative argument raised a number of fundamental questions of principle which Ofcom had not considered. In particular, there was no analysis in the Final Statement, or evidence in the appeal proceedings, as to what proportion of the anticipated new users might be expected to refrain from purchasing 10G services in the face of a SSNIP at 10G. Nor did the Final Statement or Ofcom's Defence address the timeframe for the 10G SSNIP. Even when invited to do so, Ofcom was not able to describe a plausible scenario where the number of 'lost' anticipated new 10G users would render the 10G SSNIP unprofitable. Given the errors identified at subparagraph (1) above and the fact that Ofcom could not identify a plausible scenario where a 10G would be

unprofitable, we concluded that Ofcom's conclusion that a 10G SSNIP would be unprofitable could not stand.

468. We therefore concluded that BT succeeded under issues 2 and 3. We decided that it would be appropriate to quash Ofcom's findings and remit them to Ofcom for reconsideration because we did not consider that we were ourselves in a position to substitute our own findings on whether or not the 1G and10G SSNIPs would be unprofitable.

(b) Geographic Market Definition – Issues 6 and 7

469. In the Final Statement Ofcom defined three geographic markets for CISBO services in the UK (excluding Hull): the Central London Area ("CLA"), the London Periphery ("LP") and the Rest of the UK ("RoUK"). In arriving at those three geographic markets, Ofcom used two tests (the 'Network Reach Test' and 'Boundary Test') as proxies to assess the differences in competitive conditions across the UK. BT contended that Ofcom erred in its geographic market definition, in particular in its specification and application of the Network Reach Test and/or Boundary Test.

470. It was common ground that it is appropriate for an authority to aggregate areas where competitive conditions are sufficiently homogeneous and which can be distinguished from neighbouring areas in which competitive conditions are appreciably different. Using the Network Reach Test, Ofcom identified the CLA, the LP, and the Central Business Districts of Manchester, Bristol, Birmingham, Glasgow and Leeds (the "CBDs") as candidate areas whose competitive conditions potentially differed materially from those in the RoUK. However, Ofcom went on to find that it was not appropriate to define the CBDs as a separate market from the RoUK.

471. Ofcom relied upon a number of metrics to support its conclusion that the CBDs should not be defined as a separate market from the RoUK. Ofcom also relied on the fact that it would have found SMP and imposed the same remedies in both the CBDs and the RoUK as supporting its conclusion that the areas formed a single relevant geographic market.

472. We concluded that the metrics relied on by Ofcom did not support the conclusion that competitive conditions in the CBDs and the RoUK are sufficiently homogeneous to justify placing the CBDs and the RoUK in the same geographical market. In particular, we found that:

(1) Ofcom was wrong to take the view that certain of the metrics supported its view that the CBDs and RoUK were sufficiently homogeneous to place them within the same geographic market: in fact they showed the opposite.

(2) Ofcom had asked itself the wrong question in relation to a number of the metrics. In relation to these metrics Ofcom had incorrectly compared the CBDs to the LP instead of comparing the CBDs to the RoUK.

(3) Having defined the relevant product market as comprising all CISBO services, Ofcom incorrectly relied on metrics relating to a selected part of the product market (VHB) when examining some of the competitive conditions for the purpose of defining the geographic market.

(4) Having included Ethernet in the First Mile ("EFM") within the relevant CISBO product market, Ofcom wrongly failed to take account of providers of EFM when defining or applying its Network Reach and Boundary Tests. This error reinforced the other errors that Ofcom made in relation to the CBDs.

473. We also concluded that Ofcom erred in allowing its decision on the definition of geographic markets as regards the CBDs to be influenced by its provisional assessment of SMP and remedies. The correct approach for Ofcom to have adopted was for it to form its view as to the appropriate geographical areas first and independently of the issues of SMP and remedies, and then to conduct its SMP and remedies assessments in respect of those separate areas.

474. We further concluded that Ofcom erred in adhering to its approach notwithstanding the view expressed by the European Commission that it ought

to adopt a more granular approach to reflect more accurately the competitive conditions in other areas of the UK, including in particular the CBDs. In doing so, Ofcom failed to take "utmost account" of the Commission's views as required by Article 7(5) of the Framework Directive.

475. We went on to consider a number of the specific criticisms levelled by BT against Ofcom's formulation of the Boundary Test. We did not consider that we were in a position to give a definitive ruling in relation to a number of the specific criticisms, but we did dismiss certain other of BT's specific criticisms.

476. For those reasons we concluded that it would be appropriate to quash Ofcom's finding that the CBDs and RoUK formed a single relevant geographic market and remit the matter to Ofcom for reconsideration.

(c) Competitive Core – Issue 8

477. The core is a central network of wholesale leased lines which falls outside the three geographic markets identified by Ofcom. In the Final Statement, Ofcom re-assessed the existing boundary between the competitive core and the terminating segments of BT's network. Ofcom reached the preliminary view that 96 more of BT's exchanges were now competitive, such that the scope of the core should be expanded to include them. These 96 new exchanges were selected using the threshold that two or more of key rivals were (directly) present at those exchanges. In the consultation that followed, BT identified a factor which Ofcom had overlooked (the 'indirect presence' of key rivals at its exchanges). BT argued that this indicated that more exchanges met Ofcom's threshold for inclusion in the core (407 exchanges had two or more key rivals directly or indirectly present).

478. Ofcom agreed that indirect presence was relevant to the assessment of competitive conditions and it agreed that, taken on its own, this factor might imply that more than the 96 new exchanges should be considered competitive. However, Ofcom relied on a response from another consultee which suggested that not all key rivals present at an exchange would necessarily provide a competing service to BT. Ofcom therefore revised upwards the threshold for

identifying competitive exchanges in the core, concluding that only exchanges with three or more key rivals directly or indirectly present should be considered competitive. Using this revised criterion, Ofcom ultimately decided that only 34 new exchanges should be added to the existing core.

479. BT's case at the hearing focussed on the point that there was no reliable evidence to support the contention made by the other consulteee and that Ofcom had erred in simply increasing the threshold for its presence test without going back to assess the competitive conditions at the initially identified 96 new exchanges or cross-checking the competitive conditions at those 96 new exchanges against the exchanges in the existing core network. That risked inconsistency, in that some new exchanges that were as competitive as those in the existing core would not be deregulated; and some exchanges in the existing core would fail the new test. We considered that BT's contentions were correct, and that it would therefore be appropriate to quash Ofcom's finding and remit it to Ofcom for reconsideration.

(2) Disposition

480. As set out in our ruling of 26 July 2017 ([2017] CAT 17), we have therefore unanimously concluded that:

(1) Ofcom erred in concluding that it was appropriate to define a single product market for CISBO services of all bandwidths;

(2) Ofcom erred in concluding that the RoUK comprises a single geographic market; and

(3) Ofcom erred in its determination of the boundary between the competitive core segments and the terminating segments of BT's network.

481. However, as explained above, we do not consider ourselves to be in a position to substitute our own findings in relation to any of the above matters. The matters will therefore be remitted to Ofcom for reconsideration.

(3) Final remarks

482. We would like to thank the parties' legal representatives for their assistance during the proceedings. In particular, we were assisted by the parties' preparation of a 'technical primer' and participation at an informal 'teach-in' session which gave us a valuable opportunity to familiarise ourselves with the underlying technology in a non-adversarial setting in advance of the substantive hearing.

483. We will hear the parties on an appropriate form of order and costs.

Mr Justice Snowden Dr Clive Elphick Professor John Cubbin
Chairman

Charles Dhanowa O.B.E., Q.C. (*Hon*) Date: 10 November 2017
Registrar

ANNEX 1

LIST OF ISSUES

BT Ground D.1. – Ofcom erred in declining to find separate Lower Bandwidth and VHB product markets in BCMR 2016

Issue 1 – Demand Side: Whether Ofcom erred in failing to undertake a quantitative SSNIP analysis in this case (having regard to the regulated prices for 1GB and VHB services).

Issue 2 – Demand Side Response to a SSNIP for 1Gb Ethernet: Whether Ofcom erred in its conclusion that a SSNIP for 1Gb Ethernet would be rendered unprofitable by a sufficient demand-side response, in particular, whether that conclusion was wrong having regard to the following evidence taken together:

Issue 2.1: Evidence of functional substitutability.

Issue 2.2: Evidence of migration trends (including evidence of observed market trends and commercial reality) and the impact of a SSNIP on the speed of upward migration.

Issue 2.3: Evidence of 1Gb Ethernet vs VHB costs and pricing/ total costs of ownership.

Issue 2.4: Evidence on switching costs and barriers.

Issue 2.5: Evidence from the BDRC Survey.

Issue 2.6: Evidence from BT's and another CP's documents as to the factors taken into account in pricing and marketing VHB services. […]

Issue 3 – Demand Side Response to a SSNIP at VHB: Whether Ofcom erred in its conclusion that a SSNIP at VHB would be rendered unprofitable by a sufficient demand-side response. In particular, whether that conclusion was wrong having regard to the following evidence taken together:

Issue 3.1: Evidence of functional substitutability.

Issue 3.2: Evidence of migration trends and potential for acceleration, delays or changes to plans regarding upward migration.

Issue 3.3: Evidence of 1Gb vs VHB costs and pricing/ total costs of ownership.

Issue 3.4: Evidence on switching costs and barriers.

Issue 3.5: Evidence from the BDRC Survey

Issue 3.6: Evidence from BT's and another CP's documents as to the factors taken into account in pricing and marketing VHB services. […]

Issue 4: [Deliberately omitted, see paragraph 122 of the judgment.]

Issue 5: [Deliberately omitted, see paragraph 122 of the judgment.]

BT Ground of Appeal D.2. – Ofcom erred in its geographic market definition – in particular, its formulation and application of the High Network Reach analysis and Boundary Test

Issue 6: Whether Ofcom erred in its formulation and application of the Boundary Test and/or application of the High Network Reach Test as used to (i) identify heterogeneity in competitive conditions between geographic areas and/or (ii) (in the case of the Boundary Test) identify geographic areas in which there is likely to be effective competition. [Footnote omitted] In particular, whether it erred with respect to:

> **Issue 6.1** – Boundary Test formulation: The Boundary Test requirement for businesses to have an average of: (a) five or more OCPs within a given buffer distance; and/or (b) four or more OCPs within a given buffer distance and at least two OCPs within a given buffer distance of 90% of businesses.
>
> **Issue 6.2** – Boundary Test formulation: The length of the buffer distance used in the Boundary Test.
>
> **Issue 6.3** – Boundary Test/HNR application: Measuring the required dig distance using CPs' fibre flexibility points.
>
> **Issue 6.4** – Boundary Test/HNR application: Using "large business sites" as a proxy for actual or potential demand.
>
> **Issue 6.5** – Boundary Test/HNR application: Not including (i) microwave or (ii) EFM providers as relevant OCPs.
>
> **Issue 6.6** – Boundary Test/HNR application: Using postcode sectors as the geographic unit of analysis for the application of the Boundary Test/HNR.

Issue 7: Whether Ofcom erred by not carrying out a cumulative sensitivity analysis to assess the robustness of the Boundary Test.

BT Ground of Appeal D.3. – Ofcom has erred in its assessment of the extent of the competitive core network

Issue 8: Whether Ofcom has arbitrarily and without proper justification departed from its consultation methodology for assessing competitive core conveyance.

ANNEX 2

ABBREVIATIONS USED IN THIS JUDGMENT

Abbreviation	**Paragraph where first used**
Legislation / Guidance	
2003 Act	16
AD / Access Directive	45
BEREC Common Position	69(4)
Explanatory Note	5
FD / Framework Directive	45
Notice / Notice on Market Definition	69(1)
OFT Guidance	69(3)
Recommendation	5
SMP Guidelines	69(2)
Entities	
BEREC	52
BT	2
CF	14(2)
CMA	16
Colt	3
Commission	5
CP Group	3
Gamma	3
Ofcom	3
TalkTalk	3
VM	2
Vodafone	3
Other terms	
10G SSNIP	174
10M /100M	26
1G / 10G / 100G	26
1G SSNIP	174
2x1G	177
AM 2015 Report	266
Bandwidth	26
BCMR 2013	7
BCMR 2016	3
BDRC Survey	177
Bishop & Walker	157
Boundary Test	125(2)
BT+2 PCOs directly or indirectly present	442(1)
BT+3 PCOs directly or indirectly present	446
Business Access	36(1)
CBD	126