



Anticipated Acquisition by BT Group plc of EE Limited

**Vodafone Initial Phase 2 Submission
to the Competition and Markets Authority**

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1. EXECUTIVE SUMMARY

1.1 Vodafone welcomes the opportunity to present its views to the Competition and Markets Authority (“**CMA**”) on the proposed acquisition of Everything Everywhere (“**EE**”) by BT Group plc (“**BT**”) following the CMA’s decision to refer the merger for an in-depth Phase 2 investigation.

1.2 The combination of BT and EE raises significant competition concerns which would give rise to a substantial lessening of competition (“**SLC**”) in the following markets in particular:

(i) **Supply of fibre backhaul services to mobile network operators (“MNOs”):**

(a) BT (as the incumbent) owns the most extensive backhaul network and supplies indispensable fibre backhaul inputs to MNOs, including Vodafone, which are therefore reliant on BT to compete effectively downstream. MNOs have only limited alternatives to BT for the supply of fibre backhaul:

(I) No other provider can compete with BT’s wide-reaching incumbent fibre network and its ubiquitous presence in, and links between, the 5,000+ BT local exchanges. As a result, substitutes for both BT Wholesale and BT Openreach products are limited.

(II) BT also benefits from its incumbency as MNOs face significant costs, delays and operational risks when switching backhaul provider.

(III) In addition, MNOs are tied into long-term contracts with BT Wholesale (which provides the vast majority of backhaul to MNOs) with burdensome volume commitments which further restrict MNOs’ ability to explore alternative supply options or benefit from any protection offered by Ofcom regulation (with respect to BT Openreach products).

(b) BT already has a history of using its significant upstream market power to the detriment of customers, which will only increase following the acquisition of EE by BT as the combined entity will:

(I) have the ability and enhanced incentive to foreclose downstream MNO competitors, including Vodafone, by discriminating against them in quality of service and/or delivery, by raising input costs, and/or by frustrating innovation (e.g. delaying or otherwise frustrating the development of inputs necessary for new or enhanced MNO products) in respect of both BT Wholesale and BT Openreach products; and/or

(II) have the ability and incentive to engage in margin squeeze between EE’s retail prices and the prices of BT’s wholesale

backhaul inputs in order to undermine the position of other MNOs relative to EE in retail mobile markets.

- (c) Whilst BT already has the ability to foreclose downstream competitors, the merger will increase BT's incentive to do so since it will own a downstream MNO itself, with EE being a direct rival to Vodafone, O2 and 3. BT's ability and incentive to engage in margin squeeze arises as a direct result of the acquisition of EE.
- (d) BT's ability to weaken its competitors via foreclosure or margin squeeze in relation to its essential backhaul inputs also means that the merger is likely to result in harm to the network sharing arrangements in the UK.
- (e) These concerns are not prevented or addressed by sectoral regulation.

(ii) **Provision of retail and wholesale mobile voice and data services:**

- (a) **Spectrum:** the combined BT/EE entity will have an unmatched advantage in terms of its spectrum holdings. The combined BT/EE will hold c. [redacted] % of all 4G ready spectrum (i.e. the 800 MHz, 1800 MHz and 2.6 GHz paired bands), providing it with significant spare capacity. Vodafone and the other MNOs are spectrum constrained and will face significantly higher costs to match BT/EE's speed and capacity, thereby constraining their ability to compete effectively, including their ability to innovate in the provision of 4G services and provide effective competition. In the counterfactual, BT would likely have used its full spectrum capacity in providing a competing retail offering. By contrast, post-merger BT/EE would have the ability to offer superior speed and capacity but would either have little incentive to do so (i.e. BT/EE would hoard its additional unused 4G ready spectrum) or would only do so at significantly higher prices compared to the counterfactual absent the merger. This will lead to less choice, higher prices and lower quality for retail consumers; and
- (b) **Network sharing:** [redacted] BT/EE will have an incentive to raise prices and reduce quality and investment. This will lead to less choice, higher prices and lower quality for retail and wholesale consumers.

[redacted]. These issues are exacerbated if the 3/O2 merger also goes ahead. [redacted].

- (iii) **Triple-play and quad-play packages:** in order to supply triple-play or quad-play packages, Vodafone and other players are reliant on BT to provide the superfast broadband element. Following the merger, BT will have the ability and enhanced incentive to foreclose access to essential wholesale inputs to superfast broadband in order to restrict the ability of Vodafone and other players to compete with BT/EE's enhanced triple-play and quad-play offerings.

1.3 These concerns are mutually reinforcing and likely individually and in combination to result in the marginalisation of Vodafone and other MNOs. Unless these competition



concerns can be addressed through comprehensive and fully effective remedies, the merger will have serious negative consequences for BT/EE's customers and end consumers generally. In addition, the merger will have a major adverse impact on competition in technology markets which are crucially important to the UK economy and consumers over both the short- and long-term.

- 1.4 A report commissioned by BT published in June 2015 (the "**Kenny report**")¹ has claimed that "*the merger has the potential to generate a wide array of customer benefits driven by enhanced investment, innovation, efficiency and competition for converged services*". Significantly, the author was only asked to look at benefits and not the potential detrimental impact on competition.² In any event, while it is true that the merger would result in BT/EE gaining significant (and unmatched) advantages, including with respect to backhaul, spectrum, network sharing and triple-play/quad-play packages, BT/EE will not have the incentive to deploy these advantages to the benefit of consumers if its competitors are unable to compete effectively. As Commissioner Vestager has observed "*it is ... competition that will lead to investment and not the other way round*".³
- 1.5 The combination of BT and EE will in fact lead to a reduced incentive on the part of BT/EE to compete. The significant advantages that BT/EE will acquire will lead to the marginalisation of other MNOs, who will face significantly higher costs to match BT/EE's speed and capacity and thereby be constrained in their ability to compete effectively against BT/EE at retail and wholesale level. As a result, BT/EE will not have the incentive to pass on to customers any benefits gained as a result of the merger, and on the contrary will act as a residual monopolist by raising prices and reducing quality and investment. This will lead to a substantial lessening of competition, to the detriment of consumers who will experience less choice, higher prices and lower quality.
- 1.6 These concerns will be further exacerbated by the proposed acquisition of O2, which is owned by Telefónica (together referred to as "O2"), by Hutchison Whampoa, the owner of 3 (together referred to as "3"). The CMA should consider the combined implications of the BT/EE merger and the O2/3 merger as part of its assessment of the BT/EE transaction [X].
- 1.7 The CMA should also consider the possibility of spillover effects with respect to Deutsche Telekom, which will enter into an agreement governing its relationship as a shareholder in BT. Deutsche Telekom and BT are competitors in many markets, especially in services to business customers and carrier services, both in the UK and throughout Europe.

¹ Robert Kenny, Communications Chambers: "*An analysis of the benefits to UK consumers, businesses and citizens from BT's acquisition of EE*", p.1.

²<http://www.thisismoney.co.uk/money/markets/article-3128689/Expert-hired-BT-investigate-EE-mega-merger-admits-asked-highlight-benefits.html>

³ See e.g. <http://www.ft.com/cms/s/0/39b90222-c425-11e4-a949-00144feab7de.html#axzz3eZk7Iz5G>.

- 1.8 The proposed acquisition of EE by BT may be expected to result in a SLC in the supply of fibre backhaul services to MNOs, in the provision of retail and wholesale mobile voice and data services, and in the provision of triple-play and quad-play packages. Accordingly, the CMA will be required to consider whether action should be taken to remedy, mitigate or prevent the SLC or any adverse effect resulting from the SLC. Vodafone notes that any remedies would need to be comprehensive in order to address effectively the serious competition concerns which result from the merger. This will require extensive design and consultation with relevant market participants including Vodafone.

2. SUPPLY OF BACKHAUL SERVICES TO MNOS

(A) Overview of competition concerns

- 2.1 Vodafone welcomes the CMA's conclusion in its decision of 9 June 2015 in relation to the *Anticipated acquisition by BT Group plc of EE Limited* (the "**Phase 1 decision**") that the proposed merger gives rise to a realistic prospect of a SLC in the supply of fibre backhaul services to MNOs in the UK.⁴
- 2.2 BT supplies indispensable fibre backhaul inputs for MNOs, including Vodafone, which are therefore reliant on BT to compete effectively downstream. MNOs have only limited alternatives to BT for the supply of fibre backhaul:
- (i) No other provider can compete with BT's wide-reaching incumbent fibre network and its ubiquitous presence in, and links between, the 5000+ BT local exchanges. As a result, substitutes for both BT Wholesale and BT Openreach products are limited.
 - (ii) BT also benefits from its incumbency as MNOs face significant costs, delays and operational risks when switching backhaul provider.
 - (iii) In addition, MNOs are tied into long-term contracts with BT Wholesale (which provides the vast majority of backhaul to MNOs) with burdensome volume commitments which further restrict MNOs ability to explore alternative supply options or benefit from any protection offered by Ofcom regulation (with respect to BT Openreach products).
- 2.3 BT already has a history of using its significant upstream market power to the detriment of customers, which will only increase following the acquisition of EE by BT, as the combined entity will have the ability and enhanced incentive to:
- (i) Foreclose downstream MNO competitors, including Vodafone, by discriminating against them in quality of service and/or delivery, by raising input costs, and/or by frustrating innovation (e.g. delaying or otherwise frustrating the development

⁴ Phase 1 decision, para. 8(b).

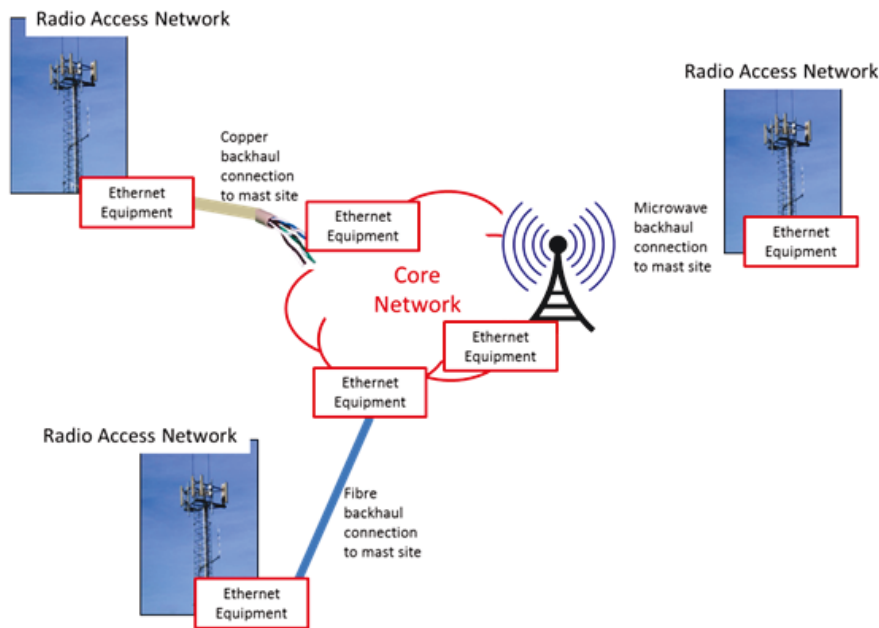
of inputs necessary for new or enhanced MNO products) in respect of both BT Wholesale and BT Openreach products; and/or

- (ii) Engage in margin squeeze between EE's retail prices and BT's wholesale prices for fibre backhaul inputs, in order to undermine the position of other MNOs relative to EE in the retail mobile markets.
- 2.4 Whilst BT already has the ability to foreclose downstream competitors, the merger will increase BT's incentive to do so since it will own a downstream MNO itself, with EE being a direct rival of Vodafone, O2 and 3. BT's ability and incentive to engage in margin squeeze arises as a direct result of the acquisition of a downstream MNO (EE).
- 2.5 BT's ability to weaken its competitors via foreclosure or margin squeeze in relation to its essential backhaul inputs also means that the merger is likely to result in harm to the network sharing arrangements in the UK.
- 2.6 The sections which follow set out an introduction to backhaul, its importance for MNOs and the different types of backhaul, before explaining in more detail BT's fibre backhaul products and why these are an essential input for MNOs. We then address the ability and incentive of BT/EE (through both BT Wholesale and BT Openreach) to foreclose Vodafone and other MNOs post-merger, and the ability and incentive of BT/EE to engage in margin squeeze. Finally, we explain the reasons why sectoral regulation does not prevent or address the SLC.

(B) Background

- 2.7 Backhaul is the network connection between the MNO's core network and the mobile site (where antennae and electronic communications equipment are placed, usually on a radio mast, tower or other high place). It provides transport for the traffic to and from the mobile site to a point in the core network where it is aggregated. The MNO's network decides how to deal with the traffic, which is then routed from the core network to its final destination.

Figure 2.1
Backhaul connections from mobile site to core network



Source: Vodafone

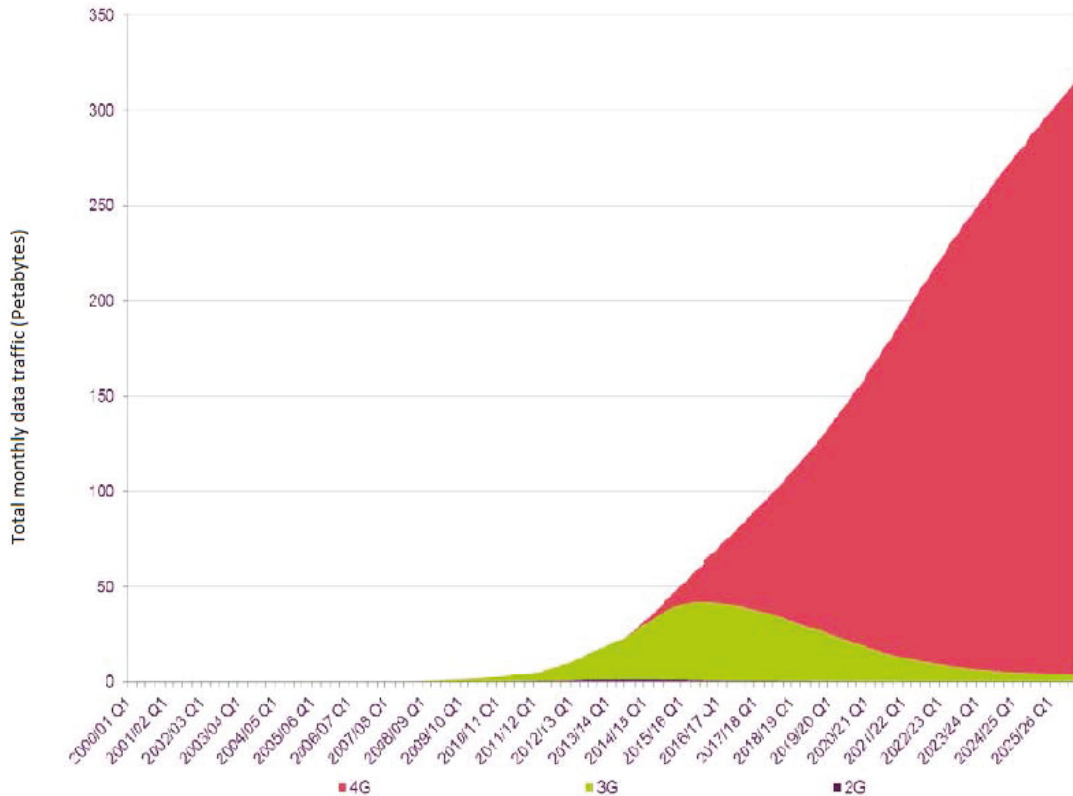
- 2.8 Ensuring sufficient capacity in the connection between the mobile site and the core network is vital. If backhaul is expensive, overall capacity will generally be limited to the level of affordable backhaul, limiting the customer experience. Congestion in this area of the network means that voice calls cannot be made and data is buffered (i.e. held in a queue). Sufficient backhaul must be provisioned in the links to and from each mobile site in order to ensure that it does not create a bottleneck that reduces the available capacity and therefore deteriorates the consumer's experience. As a result, any deterioration in price and non-price aspects of mobile backhaul services has a direct adverse impact in downstream retail and wholesale mobile markets.

(C) Importance of backhaul

- 2.9 There is increasing customer demand for mobile data, spurred on by the transition from voice-centric 2G/3G to data-centric 4G mobile technologies (see further paragraphs 3.7 to 3.9 below). The data service demands from 4G technology considerably dwarf the demands of voice services, requiring much higher bit rates and therefore almost exponentially increasing the requirement for backhaul bandwidth: see Figure 2.2 below.⁵

⁵ For example, while one minute of voice may consume only 0.1 MB of data, downloading may consume between 3 to 10 MB, an hour of browsing may consume 15 MB and watching a TV show may consume 37.5 MB (and 95 MB in high-definition): see e.g. <http://www.o2.co.uk/help/phones-and-devices/demystifying-data>.

Figure 2.2
Impact of 4G on mobile traffic



Source: Ofcom, *Mobile call termination market review 2015-18* (February 2015)

- 2.10 Ofcom has noted that “as more devices that are able to connect to mobile networks become more popular, more data use on mobile networks seems inevitable.” It is also predicted in the Kenny report that mobile internet traffic will increase by a factor of 6.4 over the four years to 2018, and that there will be an increasing demand for data and speed in fixed and mobile networks and expectations of ubiquitous, seamless and reliable connectivity.⁶ BT has also recognised that “the world is changing with customers wanting access to the internet on their terms. They are spending more time online than ever before and they want the best connection whether they are at home, in the office or on the move”.⁷
- 2.11 This has become a significant factor in rolling out 4G networks, and a potential bottleneck to providing a good customer 4G mobile data experience. Customers are heavily influenced by their network experience and by marketing that promotes the “best network”. Therefore, provisioning inadequate backhaul such that it constrains the

⁶ Kenny report, p. 8 and 11.

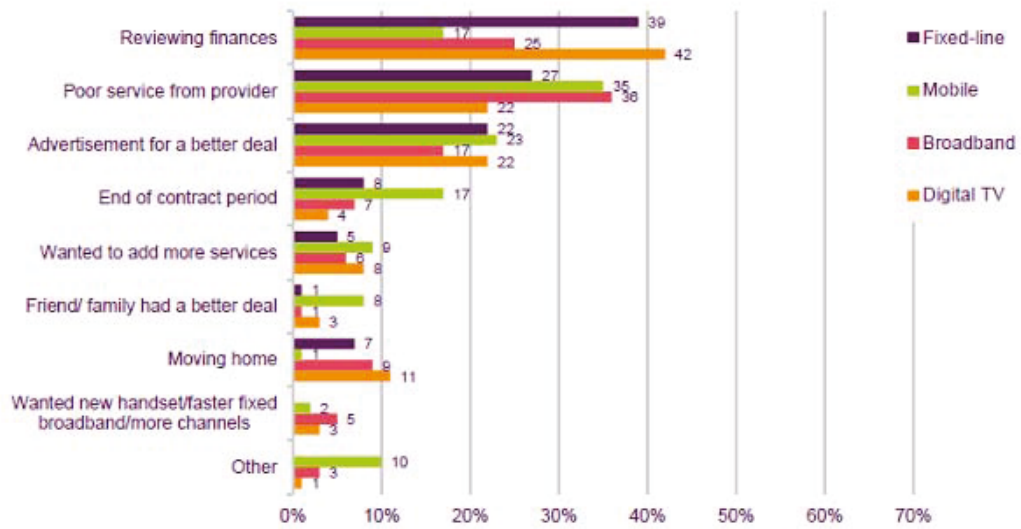
⁷ BT press release 17 June 2015: BT & EE Chief Executive say deal will create a UK digital champion: <http://www.btplc.com/News/#!/pressreleases/bt-ee-chief-executive-say-deal-will-create-a-uk-digital-champion-1180519>.

available capacity would limit Vodafone's and other MNOs' ability to compete for customers who value high speed and throughput.

- 2.12 Customers consider network quality (including coverage, performance and service quality), as well as price-related factors, to be important factors in their decision to choose or switch retail mobile providers. Ofcom's switching data in Figure 2.3 below shows that 35% of subscribers were prompted to start looking for a new mobile provider due to "poor service", which was by far the most important factor driving mobile switching. Price-related factors (such as "reviewing finances", "better deal") are also significant in prompting subscribers to start looking for a new provider.

Figure 2.3

Ofcom: "What prompted switchers to start looking for a new provider, by market"⁸



Source: Ofcom.

- 2.13 The scale of the increase in required backhaul bandwidth as a result of these developments is illustrated by data collected by Ofcom: see Table 2.1 below. While there has been only a 2.5% increase in the number of mobile connections across the UK since 2011, there has been a near 500% increase in mobile data volumes during the same period.

⁸ Ofcom, "The Consumer Experience of 2014: Research report", Figure 162.

Table 2.1
Comparative mobile data usage in the UK, 2011-2014

	March 2011	June 2012	June 2013	June 2014
Active connections (m)	81.1	82.2	82.7	83.2
Total data uploaded/downloaded (GB'm)	9	19.7	28.9	44.3
Data per active connection (GB)	0.11	0.24	0.35	0.53

Source: *Ofcom Infrastructure Report 2014*

- 2.14 Vodafone's roll out of its 4G network is expected to continue for the next few years. Network upgrades are labour intensive, costly and potentially service-disrupting. Wherever possible, a balance needs to be found between building network solutions that work for today, which can be deployed in a timely and efficient manner but provide no possibility of increased capacity or capability, and solutions that offer easier upgrade paths but may require more initial investment. [REDACTED].

(D) Types of backhaul

- 2.15 There are currently four main methods of supplying backhaul services in mobile networks today:
- (i) **Copper:** the available average bandwidth for copper is limited to multiples of 2 Mb/s (depending on how much copper is used), generally up to a maximum of 8 Mb/s. This is not sufficient for 4G data requirements and so, as mobile sites are upgraded to 4G, copper-based backhaul links are being replaced.
 - (ii) **Microwave:** this has traditionally been used to provide backhaul to many mobile sites. Although this can be an effective solution, its deployment is limited by many factors, including:
 - (a) Bandwidth: microwave suffers from fluctuations in bandwidth availability due to atmospheric conditions. Although a microwave link can, in theory, achieve a relatively high bit rate in peak conditions, significant losses will occur in poor weather and in some cases the signal may be so poor that no throughput is possible. [REDACTED].⁹ Furthermore as 4G networks rely on (and customers increasingly expect) constant, high bandwidth availability, microwave is a sub-optimal backhaul solution in many circumstances and will be unable to provide sufficient capacity for backhaul to urban macro and a significant proportion of rural sites in

⁹ [REDACTED].

future.¹⁰ As mobile data usage increases, it will become increasingly difficult to use microwave to accommodate the bandwidths needed.

- (b) Spectrum availability: currently at least half of the microwave links used by Vodafone use Ofcom-administered spectrum.¹¹ There is no ability to reserve such spectrum in order to plan networks or save capacity for the future.¹² As such, this spectrum operates on a first-come, first-served basis. Lower frequency spectrum (which travels further) is generally less available than higher frequencies and there is no visibility of spectrum availability in particular geographic locations until the application for a spectrum link is submitted to Ofcom. This does not therefore provide a secure way of planning and building networks (see further paragraph 3.21(i)).
 - (c) Line of sight and environmental factors: microwave links require line of sight between the antennae at each end, making areas with certain features (e.g. tall buildings, hills) unsuited to microwave backhaul. In addition, bad weather conditions can degrade the signal.
 - (d) Suitable structures, planning and landlord consents: to place new or additional microwave equipment upon a site requires that site to have the structural strength and space to accommodate the equipment. It may also require planning permission and/or re-negotiation of the site lease or licence.
 - (e) Distance and multiple “hops”: although using a higher frequency of spectrum for backhaul will accommodate higher throughput, the distance the signal can travel will be shorter. Spectrum scarcity in lower bands often requires MNOs to use higher frequencies and increase costs by re-transmitting and amplifying the signal with additional equipment along the route (known as “hopping”). [X].
- (iii) **E-band**: this microwave technology is newly available on the market and can achieve bandwidths up to 2 Gb/s using the 60-100 GHz spectrum bands. However, E-band cannot be used for backhaul in many areas for a number of reasons:
- (a) Propagation: E-band can propagate signals up to 3km (compared with traditional microwave of up to 12km). This is a particular limitation in

¹⁰ See e.g. Analysys Mason, “*Mobile backhaul market: Phase 1 report*” (February 2014), page 26.

¹¹ This is distinct from the spectrum which is auctioned and licensed to MNOs and used to carry signals from customer handsets to base stations.

¹² [X].

rural areas, where the distance between mobile sites and the core network is usually greater than 3km.

- (b) Line of sight: E-band, along with other microwave technology, requires line of sight between the two antennae. This reduces the possible scope of coverage where low level masts are in use and is exacerbated by restrictions on mast height imposed by UK planning laws.
- (c) Environmental factors: the wavelength technology underpinning E-band requires extremely sturdy masts as signal loss can occur when the antennae move in windy conditions. Mast or rooftop towers are therefore the only locations which are sufficiently stable to support the antennae without resulting in loss to the signal in windy conditions. Smaller and thinner structures such as street furniture and monopoles (a type of radio antenna consisting of a straight rod-shaped conductor mounted on a conductive surface) are not suitable.
- (iv) **Fibre:** optic-fibre based backhaul is the most effective backhaul choice, with few distance limitations. It is robust, requires little ongoing maintenance and can be used to provide a variety of bandwidths (depending on the type of product), making it particularly suitable for 4G. The main disadvantage is that the fibre needs to be physically connected to the sites, requiring it to either be buried underground or carried overhead on poles. As a result, new roll out is costly, especially into remote areas.

2.16 Given the limitations of alternative methods of backhaul supply (i.e. copper, microwave and E-band), the ability to access and use fibre backhaul is critical for MNOs to compete effectively going forward, in particular in data-centric 4G services. The CMA in its Phase 1 decision has already recognised that “[o]f these different media, it is widely considered that fibre backhaul is the most effective, particularly for the provision of 4G backhaul in high-demand areas” and “there is no effective alternative to fibre backhaul for an increasing number of base stations.”¹³ This is also supported by a report on backhaul by Analysys Mason:

¹³ Phase 1 decision, paras. 69 and 74.

“[W]hile microwave links are capable of meeting current needs, they will rapidly become insufficient as high bandwidth LTE sites are deployed. These constraints will apply soonest in areas where large quantities of spectrum for such microwave links cannot be made available. This means that the self-supply option for providing mobile backhaul will no longer be as capable as the fibre-based option available to an integrated former incumbent mobile operator, unless access to ducts or dark fibre can be achieved.”¹⁴

(E) BT’s fibre backhaul products

2.17 It is important to understand that BT supplies fibre backhaul products to MNOs through both BT Openreach and BT Wholesale, although the vast majority (at least 90%) of backhaul is supplied by BT Wholesale.¹⁵ The differences between the BT Openreach and BT Wholesale offerings are explained below.

2.18 **BT Openreach** offers a variety of Ethernet products that can be used for mobile backhaul, including in particular Ethernet Access Direct (“**EAD**”) variants together with Ethernet Backhaul Direct (“**EBD**”):

- (i) EAD Local Access (“**EAD LA**”) provides a connection between the base station and the BT fibre-enabled local exchange that covers the local area in which the base station is situated.¹⁶ Unless the MNO has its own equipment at each local exchange, the MNO cannot rely entirely on EAD LA. Vodafone has its own equipment at a number of local exchanges and so it is able to use EAD LA to connect base stations to its own network at these exchanges. However, Vodafone cannot rely entirely on EAD LA inputs, because it does not have its own equipment at every local exchange serving each of its base stations requiring fibre backhaul.
- (ii) EAD Not Local Access (“**EAD NLA**”)¹⁷ provides a connection between the base station and another point that is within 35km of the base station.¹⁸ This other point is usually the nearest BT access serving node (“**ASN**”) exchange, but in

¹⁴ Analysys Mason, “*Mobile Backhaul Market: Phase 2 Report*” (May 2014), page 29.

¹⁵ See Phase 1 decision, para. 103.

¹⁶ BT describes this product as providing “access as far as the fibre serving exchange”, see e.g. <https://www.openreach.co.uk/orgg/home/products/ethernetservices/ethernetaccessdirect/ead/downloads/eadfactsheet.pdf>.

¹⁷ Please note that BT refers to this product simply as “EAD”; Vodafone has adopted the terminology “EAD Not Local Access” (EAD NLA) for the avoidance of confusion with references to EAD products as a whole. This is not a term used by BT as far as Vodafone is aware.

¹⁸ e.g. BT describes EAD 1 Gbit/s (without differentiating between standard EAD NLA and EAD ER) as having a “maximum radial distance” of 35km: <https://www.openreach.co.uk/orgg/home/products/ethernetservices/ethernetaccessdirect/ead/downloads/eadfactsheet.pdf>.

principle it could be the MNO's own core network site if the MNO happens to have a core network site within 35km. There are 1,163 ASNs in BT's network. ASNs are located in a subset of BT's 5,000+ local exchanges that have been chosen by BT as points for the aggregation of significant traffic, and are typically located in local exchanges in larger towns and cities. ASNs are end points of BT Openreach's EBD service (see below).

Therefore, for a MNO to rely on EAD LA and EAD NLA for all of its backhaul requirements, the MNO must at least have equipment in every ASN exchange so that it can take the traffic onto its own network at that point. EAD NLA saves the MNO from rolling out its network to each of BT's 5,000+ local exchanges as would be necessary to rely solely on the EAD LA product. However, to use EAD LA and EAD NLA, the MNO must not only have its own equipment in at least all the ASN exchanges but must purchase or lease fibre links from each ASN back to its core network¹⁹ or build its core network all the way out to each ASN. Unless the MNO has its own equipment at each ASN exchange or a core network site nearby, the MNO cannot rely entirely on EAD NLA and EAD LA. This is because EAD NLA does not provide connectivity between any two points – it has strict distance limitations.

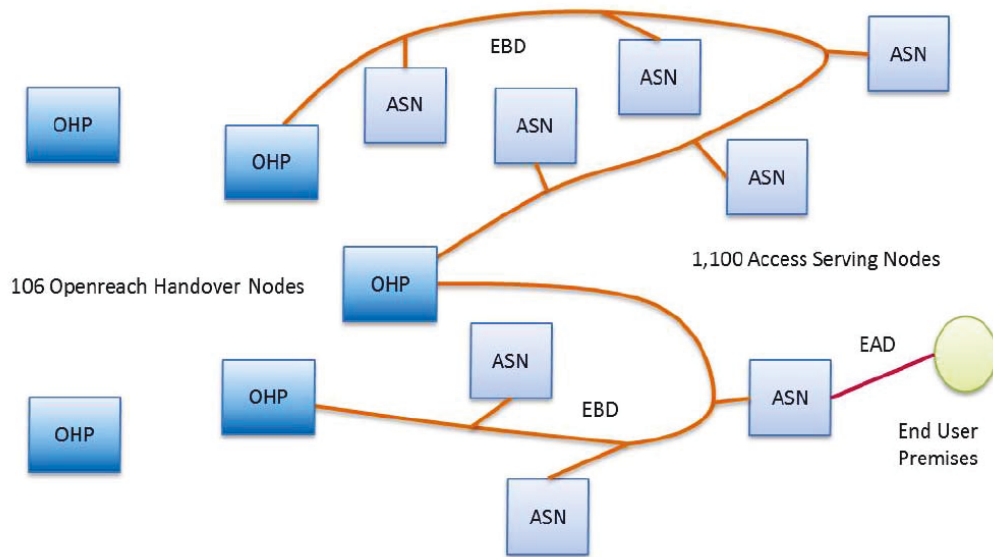
- (iii) EAD Extended Reach ("**EAD ER**") is a variant of EAD NLA. It provides, subject to survey, an EAD NLA circuit up to 86km from the base station (compared with standard EAD NLA which is restricted to 35km).²⁰ It is provided subject to survey and is expensive due to per metre charges. The EAD ER service is not a service that an MNO would use for each circuit between its core network and each base station, as (a) core networks are not typically extensive enough and (b) in any event, it would be extremely expensive to configure supply in this way and it would be more efficient to either locate the MNO's own equipment at the ASN exchanges or, for an MNO with a limited network, to purchase a managed Ethernet access service like MEAS that would transport the traffic for longer distances. [✂]; and
- (iv) EBD is restricted to supply between nominated BT exchanges (i.e. the ASN exchanges and around 100 BT core exchanges) and requires that the MNO has its own equipment at the ASN exchanges²¹, as shown by Figure 2.4 below.

¹⁹ EBD is one option for these links (see paragraph 2.18(iv)).

²⁰ e.g. BT describes EMP EAD 10Mbit/s, 100 Mbit/s and 1Gbit/s (without differentiating between standard and EAD NLA and EAD ER) as having a "maximum route distance" of 86km: <https://www.openreach.co.uk/org/home/products/ethernet-services/ethernet-access-direct/ead/downloads/eadfactsheet.pdf>.

²¹ See e.g. <https://www.openreach.co.uk/org/home/products/ethernet-services/downloads/ethernet-portfolio-training-pack.pdf>.

Figure 2.4
Ethernet Backhaul Direct



Source: Ofcom BCMR 2015

BT Openreach does not provide a service that combines EAD and EBD and connects all the way from the base stations to a third party or BT core exchanges. An MNO would need to install its own equipment in or near to the ASN exchanges to combine EAD circuits and EBD circuits.

- 2.19 Therefore, an MNO would need (as a minimum) to have its own equipment at or near to all the ASN exchanges in order to rely entirely on BT Openreach inputs.²² If the MNO does not have this, the MNO would need to purchase a managed backhaul service that includes transport over greater distances, such as BT Wholesale's MEAS or MMWE products.
- 2.20 These products are regulated on Equivalence of Inputs ("EOI") terms, but BT has considerable discretion in relation to their relative pricing, as explained further in paragraph 2.43(iii) below.
- 2.21 **BT Wholesale** purchases EAD LA and EAD NLA from BT Openreach and uses these inputs (together with others) to offer the following fibre backhaul products:
- (i) Ethernet Access Connect ("**EAC**"): BT Wholesale resells the EAD LA and EAD NLA inputs by repackaging them as EAC products. These are technically and functionally identical to EAD LA and EAD NLA, but there is scope for BT

22 [X].

Wholesale to price them differently, e.g. by offering larger up front “connection” charges and lower recurring monthly/annual charges than BT Openreach.

- (ii) Managed Ethernet Access Service (“**MEAS**”): MEAS is a managed end-to-end backhaul service for MNOs. To provide MEAS, BT Wholesale combines EAD LA inputs from BT Openreach (connecting from the MNO’s base station to the nearest local exchange) with its own 21CN network,²³ which extends to a large proportion of the 5,000+ BT local exchanges and transports the traffic from the local exchange to the points of handover with the MNO. This is particularly important for MNOs that require a third party to transport their traffic beyond the ASN or local exchange nearest to the mobile base station all the way back to the MNO’s core network.²⁴ Vodafone understands that today all four MNOs purchase MEAS for the majority of their fibre backhaul requirements.²⁵

MEAS is a service that would, in principle, allow an MNO with just one switch (e.g. in London) to connect to all of the MNO’s base stations around the country. MEAS is more than just a connectivity service: in addition to providing bandwidth from the base station to the core network, MEAS provides an end-to-end service using a virtual circuit which can provide core network resiliency by switching the traffic from one handover point to another in the event of a network failure. MEAS also provides a fully managed Ethernet connection to carry Ethernet traffic between mobile operators’ cell and core sites in a single converged packet network. In order to do this, BT Wholesale uses its 21CN Ethernet platform to provide the service and also has access to field engineers in order to deliver and run the service.

There is no combination of BT Openreach products that can be used instead of MEAS if an MNO does not (at least) have its own equipment in or close to the ASNs nearest to the base stations.

- (iii) Managed Mobile Wholesale Ethernet (“**MMWE**”): a national Ethernet service that could provide 1 Gbps connectivity between an MNO’s core network and its cell sites (via the BT 21CN network), and may be used as an “updated” version of MEAS as it provides greater flexibility as to handover point. [REDACTED].²⁶

²³ 21CN refers to BT’s network transformation project for data and voice, designed to remove duplication across BT’s existing multiple networks and systems to create a single, converged multi-service internet protocol network that can carry all types of traffic (including high speed Ethernet) and support both current and next generation services.

²⁴ For example, if a MNO’s core network only reached as far as Cardiff, but the base station is in Anglesey and the nearest ASN is in Bangor, the MNO needs a service that will bring the traffic all the way to Cardiff. BT Wholesale’s MEAS is the only BT product that can do this – EAD NLA (and EAC NLA) would only transport the traffic as far as the nearest ASN (in Bangor in this example).

²⁵ See Phase 1 decision, para. 103.

²⁶ [REDACTED].

- 2.22 BT treats BT Wholesale's fibre backhaul products as unregulated. Since BT Wholesale provides the vast majority of backhaul circuits – see paragraph 2.17 – Ofcom regulation of BT Openreach therefore has little or no impact on the conditions of supply in the backhaul market. BT Wholesale also faces little to no competition, for the reasons explained at paragraphs 2.26 to 2.28 below.
- 2.23 It is also important to note that BT Wholesale and BT Openreach, whilst trading under separate brands and organised separately internally, are not legally distinct and are part of the same legal entity, BT Group plc. BT Wholesale benefits from the strategic decisions taken by the group as a whole.

(F) BT's fibre backhaul is an essential input for MNOs

- 2.24 Backhaul circuits for 4G must have a high degree of reliability and be able to cope with a variety of terrain and environment, providing high quality connections between the mobile sites and points of aggregation distributed across the UK. As discussed above, fibre backhaul meets all of these requirements.
- 2.25 BT is uniquely positioned to supply fibre backhaul, making it the dominant provider in the UK. BT has an extensive fibre network covering almost the entire country (through approximately 5,000 fibre-enabled exchanges), with broader coverage than any other network.
- 2.26 Substitutes for BT's EAD/EAC products are limited for the following reasons:

- (i) BT has an extensive incumbent fibre network which has not been replicated by any other provider in the UK. Therefore BT fibre is typically closer to the mobile base stations than other networks.
- (ii) As a result, where network build is required, it is in most instances cheaper for BT to undertake that build, as its existing network is more extensive and therefore requires less additional fibre to be extended to a new location than other networks. In many cases (and in all cases where BT is already supplying fibre backhaul), BT already has fibre serving the site and therefore has no "dig" costs, whereas substantial "dig" costs would be incurred by Vodafone to self-supply or be supplied by another third party supplier. Alternative suppliers (such as Virgin Media and also Vodafone when it considers self-supply) must consider the distance from their existing fibre networks to the base stations – the greater this distance, the less likely that it will be possible to compete with BT in relation to supplying fibre to a base station.

As a result, Vodafone and other MNOs are still reliant on BT fibre for the "last mile" in urban/suburban areas, and this dependence is even greater for rural areas, where more extensive digging is required.

- (iii) Vodafone has limited alternative options to BT as a fibre backhaul supplier: an important factor is how close fibre belonging to alternative suppliers is to the relevant base station [X]:

- (a) The cost effectiveness of self-supply as compared to the use of EAD/EAC will depend in part on the relative proximity of the network to the relevant base station [REDACTED].²⁷ [REDACTED].
- (b) Although Virgin Media states that it can provide a similar service to BT, these assertions are not realistic except in limited specific (i.e. metropolitan) geographical areas where Virgin has an existing pre-built network.²⁸ This has been recognised by EE itself.²⁹ [REDACTED] despite the substantial capex required to connect base stations, an MNO would only be incentivised to switch from BT to a competing supplier where the price being offered would compensate for the operational risks of switching supplier [REDACTED].
- (iv) Other fibre players (e.g. CityFibre, Colt, KCOM, Level 3, Verizon, Zayo) are extremely limited geographically and would only rarely provide a theoretical alternative to the BT Openreach fibre network. The same economics apply to supply by these players as to supply by Virgin Media, only the difficulties are accentuated. [REDACTED]

The lack of substitutes due to the reasons given above is evidenced by the fact that BT has been designated as having significant market power (“**SMP**”) in relation to the provision of Alternative Interface Symmetric Broadband Origination (“**AISBO**”)³⁰ and is required to offer EAD LA and EAD NLA as regulated products.

2.27 Substitutes for BT’s MEAS/MMWE products are also limited for the following reasons:

- (i) BT has ubiquitous presence in, and links between, the 5000+ BT local exchanges, as well as benefiting from economies of scale and scope in those links. MNOs rely on BT to connect their traffic all the way back to their

²⁷ [REDACTED].

²⁸ See e.g. <http://www.networkingplus.co.uk/feature-details?itemid=420>.

²⁹ See e.g. the Combined Response of EE and MBNL to the Business Connectivity Market Review (“**BCMR**”) and Leased Lines Charge Control (non-confidential version) (September 2012), pages 6 to 8: “*In addition to the basic requirement of network reach into individual radio sites, it is therefore critical that the suppliers of leased lines for mobile have the capacity to provide a dedicated service from the mobile base station sites back to a mobile operator’s core network layer (from where the mobile network operator can route traffic to its destination, wherever that may be in the UK or globally).[...] Other operators can provide this service in certain geographic areas where they have appropriate infrastructure – most notably Virgin Media (VM) is able to provide a similar service within its former cable franchise areas. However, no other operator has the ubiquity of network provided by BT’s 21CN infrastructure [...] the ubiquity of BT’s network also allows it to provide the “any radio site to any core site” connectivity described above which other networks are not able to provide.*”

³⁰ This is a form of symmetric broadband origination service providing symmetric capacity between two sites using an Ethernet IEEE 802.3 interface; this includes BT’s EAD products. In its consultation paper for the current BCMR, Ofcom has proposed that BT be designated as having SMP in relation to the provision of Contemporary Interface Symmetric Broadband Origination, which includes those services previously defined as AISBO.

networks, generally using BT Wholesale's managed MEAS and/or MMWE products (see further paragraphs 2.21(ii) and 2.21(iii)).

- (ii) No other communications provider ("CP") has economies of scope and scale that would justify having a presence in as many local exchanges as BT Wholesale is present in. With the exception of Virgin Media in its former cable franchise areas, other CPs must rely on BT Openreach inputs in order to supply an alternative to MEAS/MMWE, and attempt to replicate the additional features that BT Wholesale is able to provide as a result of its 21CN network (see paragraph 2.21(ii)), and at a better price due to the costs and risks of switching (see paragraph 2.28). This is particularly difficult since BT Wholesale has a cost advantage: as a result of its ubiquitous presence in local exchanges, BT Wholesale can use proportionately more EAD LA inputs (as opposed to the more expensive EAD NLA inputs) than other CPs.³¹ Other CPs are therefore unable to constrain BT in the supply of MEAS/MMWE. Vodafone is not aware of any other potential suppliers of an alternative to MEAS/MMWE other than Virgin Media (see paragraph (iv) below).
- (iii) BT Openreach's delivery performance is very poor (see further paragraph 2.40(ii) and Figure 2.4). As service levels are important to MNOs and consumers, a potential competitor to BT Wholesale would in practice also need to purchase BT Openreach's Project Services product in order to minimise the risk of a poor quality service being provided by BT Openreach. This increases the potential for BT to margin squeeze, as this increases the upstream cost that other CPs must pay to BT Openreach to match the quality of service being provided by BT Wholesale, while as part of the BT Group BT Wholesale may take into account the profits it will make at the upstream level in setting the price of its MEAS service. Project Services is not a product that is subject to explicit price, quality or other types of regulation, but can nonetheless materially affect the quality of service provided in relation to regulated products such as EAD. BT Openreach is the only possible provider of such Project Services. The potential for margin squeeze through the pricing of unregulated Project Services is a further discouragement for any entry by another CP in competition with BT

³¹ See e.g. the Combined Response of EE, Three and MBNL to the BCMR (non-confidential version) (May 2014), pages 5-6: *"The availability of regulated EAD products is not sufficient to ensure effective competition in mobile backhaul. ... Mobile operators require an end-to-end nationwide service that can connect thousands of geographically dispersed mobile stations to the core network. In order to provide a competitive mobile backhaul product, other providers must incur similar costs to [BT Wholesale (BTW)]. This means that they need to be able to use the lower cost LA EAD circuits to the same extent as BTW...For other operators to do this, they need to unbundle Openreach exchanges that are close to MBNL's base stations. However, unbundling an exchange requires significant investment in backhaul, equipment and accommodation. This will only be economically viable where the volume of traffic and the cost savings from LA circuits are sufficient to justify the cost of unbundling the exchange...Due to the ubiquity of its 21CN network and economies of scale and scope from large volumes of traffic, BTW is able to source a greater proportion of LA circuits from Openreach. BTW can justify unbundling a larger number of Openreach exchanges to pick up LLU services, NGA services and mobile backhaul traffic. This gives it a cost advantage that rivals are unable to match."*

Wholesale in the supply of managed backhaul services based on buying EAD inputs.

- (iv) Virgin Media is in a slightly different position from other potential suppliers in that it has its own fibre access and aggregation networks within its former cable franchise areas, and is able within those areas to provide a service that is similar to MEAS in terms of connectivity and functionality, without relying on BT inputs. However, as discussed above in paragraph 2.26(iii)(b), Virgin Media is only able to supply this service in its former cable franchise areas and where it has fibre close enough to the base stations to make it worthwhile to dig to take its fibre to those base stations (while offering prices which are attractive compared to BT). It is therefore not a substitute for BT backhaul in many areas of the country.

2.28 In addition, MNOs are restricted in their ability to source backhaul from providers other than BT by the following operational and contractual factors:

- (i) Switching provider can incur significant delays, costs and operational risks:
 - (a) If the provider's fibre network is not already connected to the site, the provider must dig trenches and lay duct and fibre to the site, generating significant capex costs. The provider must also gain wayleaves (i.e. consent to carry out works on privately owned land) from private landlords, which are costly and can take months to agree; it will involve using Code Powers³² on a public highway and potentially the need for planned traffic management in order to close part of the road (which will take place when the local authority determines, not necessarily in the timescales of the MNO's project plan).
 - (b) In addition to the initial validation process, on-boarding a new supplier also involves fully integrating operational processes and systems so that an MNO can submit and manage the order, and manage the circuit once it has been delivered.
 - (c) These are complex projects with high risks of delays in the switching of sites to a new backhaul supplier. Switching backhaul supplier therefore comes with significant operational risks that the new supplier cannot ultimately deliver backhaul to the sites within a reasonable timeframe. For a transitional period, the MNO would also need to incur dual running costs in order to protect its business continuity. Moreover, the context is one in which remaining with BT as the supplier of fibre backhaul is very low risk as BT already has fibre to these sites.

³² i.e. provisions under the Electronic Communications Code enabling communications providers to construct infrastructure on public land, and to take rights over private land, either with the agreement of the landowner or by applying to the County Court (or Sheriff in Scotland).

- (d) In order for switching to be worthwhile, there would need to be a saving in the total cost of ownership (accounting for opex and capex) of sufficient magnitude to compensate for the additional operational risk, delays and other costs associated with switching supplier (including for maintaining existing links provided by the incumbent during the migration period).
 - (e) In addition, the lead times (which Vodafone estimates to be around [X]), and in practice may well take even longer) associated with switching an installed base to a new supplier are considerable.
- (ii) As previously noted by EE and MBNL, there are many practical difficulties in sourcing backhaul from multiple providers which significantly increase the costs of doing so relative to relying predominantly on a single supplier. For example, this increases operational complexity and requires the use of multiple network management tools and systems, making it more difficult to identify and rectify faults, as well as adding further administrative costs.³³ Since BT is an indispensable supplier for a large proportion of backhaul links, this gives BT an advantage in relation to supplying backhaul links even where there may be some contestability from other suppliers.
 - (iii) As explained further in paragraph 2.32, under their current contracts with BT Wholesale, MNOs are locked in to minimum volume commitments for several years. A MNO faces heavy financial penalties in the event that it does not meet such commitments, thereby making the possibility of using other providers during the lifetime of its contract highly unrealistic.
 - (iv) BT Wholesale, as the incumbent supplier of fixed backhaul, also has a significant advantage when tendering for new backhaul supply agreements as, by virtue of its incumbency, it has better knowledge of customer requirements than its competitors. This further limits the scope for substitution from BT backhaul to alternative sources.

2.29 [X].³⁴ BT has an approximate 80-90% share of the fibre backhaul market (i.e. including third party suppliers and self-supply).³⁵

³³ See e.g. the Combined Response of EE and MBNL to the BCMR and Leased Lines Charge Control (non-confidential version) (September 2012), pages 7 and 8: "*Purchasing backhaul solutions from multiple providers introduces additional overheads through increasing operational complexity, making network design more complex, and a need to use multiple network management tools and systems. Basic issues such as fault identification and rectification become more complex if there are a greater number of networks involved. There are, of course, also greater administrative costs from negotiating and managing a greater number of contracts and relationships.*"

³⁴ [X].

³⁵ See Phase 1 decision, para. 102.

2.30 [redacted]³⁶ [redacted]. As the backhaul cost/bandwidth relationship is linear, the costs of backhaul will increase as upgrades are required. Other costs will remain relatively constant while backhaul costs will grow, therefore making backhaul costs more important as a proportion of total costs over time. Moreover, as explained above, backhaul is an essential input to Vodafone's ability to provide retail and wholesale mobile services reliably without service degradation due to insufficient capacity, becoming increasingly important as 4G evolves and 5G is eventually deployed. In such circumstances, Vodafone considers that there is a significant risk of input foreclosure in relation to backhaul for the reasons set out below.³⁷

(G) Ability of BT/EE to foreclose Vodafone (and other MNOs)

2.31 BT supplies indispensable fibre backhaul inputs to MNOs which are therefore reliant on BT to compete downstream. For this reason and the further reasons set out below, BT has the ability, through both its Wholesale and Openreach divisions, to foreclose Vodafone (and other MNOs).

(I) Ability of BT Wholesale to foreclose

2.32 In common with other MNOs, Vodafone has a long-term contract with BT Wholesale for the supply of backhaul [redacted]. This agreement includes:³⁸

- (i) Minimum purchase requirements [redacted].³⁹ [redacted].
- (ii) Minimum volumes [redacted].⁴⁰ [redacted]; and
- (iii) Penalties for early termination [redacted].

2.33 [redacted]⁴¹, [redacted].⁴² [redacted],⁴³ [redacted]

2.34 [redacted]⁴⁴, [redacted].⁴⁵ [redacted]:

³⁶ [redacted].

³⁷ See "Merger Assessment Guidelines" (September 2010), para.s 5.6.10(a) and (b) (originally published jointly by the OFT and CC and adopted by the CMA board): The CMA should consider not only "the cost of the input to all costs of the final product", but also "the extent to which rival manufacturers can avoid a price increase by switching away from this input".

³⁸ [redacted].

³⁹ [redacted].

⁴⁰ [redacted].

⁴¹ [redacted].

⁴² [redacted].

⁴³ [redacted].

(i) [REDACTED]

(ii) [REDACTED]

2.35 The terms of Vodafone's contract restrict its ability to switch backhaul supply away from BT Wholesale. [REDACTED]

2.36 [REDACTED]:

(i) [REDACTED]

(ii) [REDACTED]

(iii) [REDACTED]

2.37 [REDACTED]⁴⁶ [REDACTED].

2.38 Furthermore, as explained in paragraph 2.27 above, other CPs cannot provide a MEAS-like service based on BT Openreach's regulated inputs and are therefore unable to provide a competitive constraint to BT Wholesale. The only other supplier of a service that is similar to MEAS is Virgin Media, but this service is provided without relying on BT Openreach inputs and can only be provided in Virgin Media's former cable franchise areas where it has its own fibre access and aggregation networks. Without access to dark fibre from BT Openreach, there will remain significant barriers to CPs being able to compete effectively with BT Wholesale in the provision of backhaul services.

2.39 BT Wholesale therefore has a position of market power *vis-à-vis* Vodafone. BT Wholesale will also be in a position of market power *vis-à-vis* other MNOs, which lack the economies of scale and scope to justify rolling out their networks to all of the ASN exchanges and will therefore remain reliant on MEAS. Vodafone notes that other MNOs are dependent on MEAS [REDACTED].

2.40 [REDACTED]:

(i) **Ability to degrade service levels:** BT Wholesale already has a history of poor service and delays in the supply of backhaul to Vodafone:

(a) [REDACTED].

(b) [REDACTED].

⁴⁴ [REDACTED].

⁴⁵ [REDACTED].

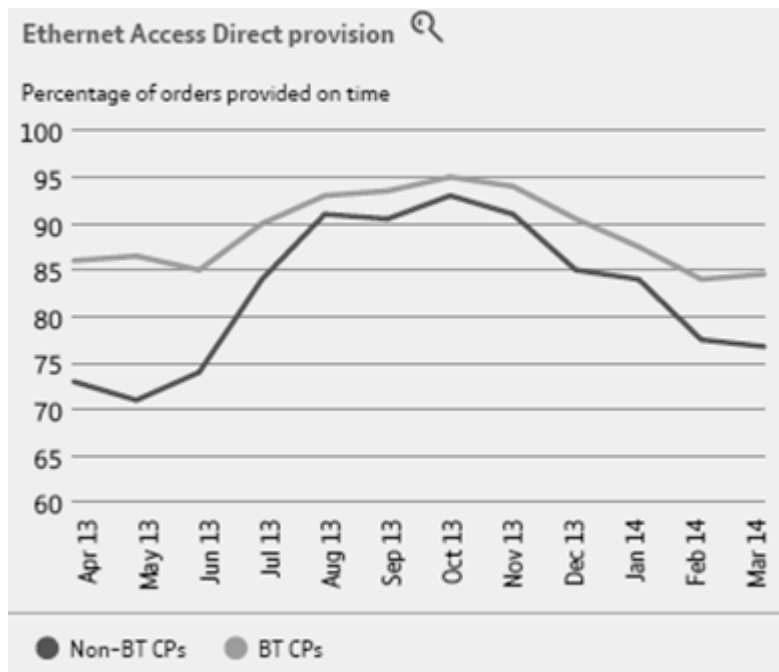
⁴⁶ [REDACTED].

(c) [REDACTED].

The acquisition of EE will further exacerbate these problems in light of the merged entity's changed incentives. If BT were to degrade backhaul quality by 10% on average this would translate directly into a similar degradation in Vodafone's overall service quality (and a more acute degradation for those individual consumers most affected).

- (ii) **Ability to degrade relative delivery quality:** BT's downstream businesses already achieve better delivery outcomes from BT Openreach than non-BT operators (see Figure 2.4 below). Vodafone understands that some of this effect arises due to BT's downstream businesses buying proportionately more "Project Services"⁴⁷ from BT Openreach (see paragraph 2.27(iii)) than other operators who seek to use their own in-house project management teams to manage BT Openreach orders. BT Wholesale could prioritise EE backhaul orders through additional Project Services from BT Openreach. As noted in paragraph 2.43(ii)(b) below, [REDACTED].⁴⁸

Figure 2.4
Ethernet Access Direct provision by BT Openreach for financial year 2013-2014



⁴⁷ "Project Services" are described on Openreach's website as "Experts who thrive on the challenge and will work alongside you, or on your behalf, to deliver your projects on time" – see e.g. <http://www.openreach.co.uk/orpq/home/solutions/managementsolutions/projectservice/projectservice.do>.

⁴⁸ Note that Figure 2.4 shows higher on-time delivery of around 77% for non-BT communications providers ("CPs") because this data includes Openreach's ability to reset the Contracted Delivery Date by, for instance applying "Deemed Consent" rules. [REDACTED].

Source: *BT Equality of Access Board Annual Report 2014*

- (iii) **Higher prices:** Vodafone expects that, post-merger, BT Wholesale will offer significantly less attractive pricing to Vodafone [redacted]⁴⁹ and thus reduce Vodafone's ability to finance the investments that it needs to make to remain competitive with EE in the long run while continuing to compete on price with EE in the short run.

2.41 From the above, it is apparent that BT Wholesale will have the ability to significantly weaken Vodafone's position through decreasing the quality of service and/or delivery Vodafone receives, and/or raising Vodafone's costs, all of which will have an impact on Vodafone's ability to compete effectively with EE in the retail mobile market. Vodafone strongly agrees with the CMA's conclusion in its Phase 1 decision that the merged entity would have the ability to foreclose rival MNOs as a result of quality deterioration and/or price increases in the fibre backhaul services provided by BT Wholesale both at contract renewal and under MNOs' current contracts.⁵⁰

(II) *Ability of BT Openreach to foreclose*

2.42 As explained in paragraph 2.18 above, BT Openreach provides the regulated backhaul inputs (i.e. EAD LA and EAD NLA) which underpin the backhaul products offered by BT Wholesale – BT Openreach's quality of service and pricing will therefore have a direct impact on the products Vodafone purchases from BT Wholesale [redacted].

2.43 However, sourcing backhaul inputs from BT Openreach does not solve the foreclosure concerns which would result from the BT/EE merger. Even though Ofcom has imposed a regulatory obligation on BT Openreach to supply its fibre backhaul products on an EOI basis, this does not take into account BT's enhanced foreclosure incentives post-merger and therefore does not afford sufficient protection to Vodafone and other MNOs. Post-merger, BT Openreach would retain the ability to foreclose downstream competitors in the following ways:

- (i) **Delayed/frustrated innovation:** the Kenny report notes that "*BT/EE would have an internal anchor tenant for wholesale products to support mobile networks, which could only increase the incentives on Openreach to develop such products*".⁵¹ However, the current regulatory framework does not prevent BT Openreach from discriminating against Vodafone and other MNOs in terms of planned innovations for the EAD products (i.e. BT Openreach would not be prevented from favouring innovations that would benefit EE or delaying/frustrating innovations that would benefit other MNOs). BT Openreach already has a history of frustrating fundamental innovation where this would

⁴⁹ [redacted].

⁵⁰ Phase 1 decision, paras 110 to 119.

⁵¹ Kenny report, page 18.

benefit third parties and this concern has previously been raised by EE itself, Three and MBNL.⁵² For example:

- (a) **Synchronisation:** this is an essential feature of radio networks, as it ensures that spectrum capacity is used effectively in the RAN and that hand-over is feasible between different radio cells. SyncE has been the international benchmark standard since around 2008 for providing this capability. However, BT Openreach took two years to get SyncE into development, only to put it on hold, leading to a final launch in March 2014 (two years after Ofcom had been advised that the product would be available imminently).⁵³ As noted by EE, Three and MBNL, “*the delay in BT’s roll-out of SyncE has also potentially stifled the ability of other CPs [i.e. communications providers] to provide SyncE technology*”.⁵⁴
- (b) **Cloud-RAN (“C-RAN”):** in light of increasing demand for 4G, MNOs are looking at the use of the new cellular network architecture presented by C-RAN as a potential solution to alleviate pressure on backhaul supply by making more efficient use of spectrum. However, it relies on access to dark fibre backhaul to ensure the minimum possible latency. BT/EE is unlikely to have sufficient incentives to invest in these developments if these would disproportionately benefit other MNOs relative to EE (especially given that EE is not spectrum-constrained in any event, unlike other MNOs – see further Section 3). The current regulatory framework does not prevent BT Openreach from discriminating against Vodafone and other MNOs in terms of such product development. [X].
- (ii) **Service level issues:** within the currently regulatory framework, there is ample scope for BT Openreach to provide lower quality service (e.g. delaying provisions or fault repairs). The current regulation sets out requirements to pay Service Level Guarantees (“**SLGs**”) and to pay them proactively. However detailed quality standards are not set. Even absent the merger, Vodafone has

⁵² In their Combined Response to the BCMR, EE, Three and MBNL noted that “*the market reality is that BTW faces weak competitive pressures to improve product quality and innovate as it would in a truly competitive environment. The current quality and pace of innovation in mobile backhaul does not “keep up” with customers’ demands [...] In the past, Ofcom has treated these issues as isolated problems with BTW’s mobile backhaul product and has offered to facilitate commercial discussions. In our view, these issues indicate that there is lack of competitive pressure on BTW. BTW’s technical capability is not keeping pace with the requirements of mobile networks.*” – See the Combined Response of EE, Three and MBNL to the BCMR (non-confidential version) (May 2014), page 6.

⁵³ See e.g. Ofcom BCMR (non-confidential version) (March 2013), para. 12.55 and 12.150: “*At the time we published the June BMCR Consultation, we understood Openreach was about to introduce a SyncE variant of its EAD product in response to a request from BT Wholesale and other CPs [...] In [BT’s] view the existing products offered by Openreach together with the new SyncE product to be launched imminently, adequately meet the requirements of MNOs*”.

⁵⁴ See e.g. Combined Response of EE, Three and MBNL to the BCMR (non-confidential version) (May 2014), page 6.

experienced considerable service level issues with BT Openreach. By way of example:

- (a) [REDACTED];
- (b) [REDACTED]; and
- (c) As noted in a report commissioned by the UK Competitive Telecommunications Association (“**UKCTA**”): *“Openreach has an extremely poor record of meeting its current service targets. For example [...] for more than two years from April 2012 to June 2014 Openreach has not met its targets for on time Ethernet provisioning”*.⁵⁵

Monetary compensation is not a substitute for the contracted-for level of service, given the direct impact that these breaches have on Vodafone’s competitive offering to its customers and hence its ability to compete. In addition, these payments form part of BT Openreach’s regulatory cost base, such that they are in practice charged back to Vodafone (and other customers) in the regulated price.

- (iii) **Higher prices:** currently the prices of BT Openreach’s EAD products are only regulated within a basket. BT Openreach therefore has discretion to move prices within that basket, allowing it to set higher prices for products that will be more important for competing MNOs and lower prices for products that will be more important for EE. For example, BT Openreach could increase prices for EAD NLA which is likely to be used proportionately more by Vodafone than by BT/EE while reducing the price for EAD LA which is likely to be used proportionately more by BT/EE (e.g. as a result of its use by BT Wholesale as an input to its MEAS product), while still meeting the overall basket price cap. The current price control set on EAD products does not place a sub-cap on EAD LA compared to EAD NLA products.

BT’s ability to manipulate the pricing in this way has been noted in the Business Connectivity Market Review (“**BCMR**”) consultation paper May 2015: *“we have found that BT now uses proportionately more EAD LA than other CPs [...] where significant differences emerge in the usage of regulated products, there is a potential for BT to discriminate in favour of its own operations by setting prices so as to favour the services it consumes proportionately more than its competitors”*. Although the BCMR consultation paper May 2015 proposes to limit the differential between EAD LA and EAD NLA products⁵⁶, such regulation

⁵⁵ See SPC Network report for UKCTA (November 2014), page 8: http://www.ukcta.org.uk/public-2014/Development_of_UK_Telecoms_Executive_Summary.pdf.

⁵⁶ The BCMR consultation paper proposes to impose a “basis of charges” condition, which would require the rental and connection charges of EAD NLA to be set by reference to the rental and connection charges for EAD LA, adjusted to reflect the difference in the long run incremental costs. The differential is to be assessed on a bottom-up basis using

is still uncertain and is in any event not intended to apply at least until the second year of the charge control, i.e. April 2017.⁵⁷

- 2.44 From the above, it is apparent that BT Openreach has the ability to significantly weaken Vodafone's position through delaying or frustrating innovation that would benefit Vodafone, decreasing the quality of service Vodafone receives and/or raising Vodafone's costs, each of which will have a substantial negative impact on Vodafone's ability to compete effectively with EE in the retail mobile market. Vodafone understands that third parties have also raised similar concerns.⁵⁸

(H) Incentive of BT/EE to foreclose Vodafone (and other MNOs)

- 2.45 Currently BT is only a very small MVNO and therefore has limited incentive to impair MNOs' ability to compete, or to favour any one MNO over another in respect of its products. BT's incentives will change fundamentally following the acquisition of EE: as a result of the merger, the UK's biggest fixed-line provider of fibre products (BT) will be combined with the UK's largest MNO (EE). BT/EE will therefore be active downstream to a very significant extent, while still being the largest provider of fibre backhaul products which have little or no substitution possibilities.
- 2.46 It is noteworthy that Analysys Mason has previously identified this as a serious concern in respect of other European markets where the incumbent fixed operator is also a major mobile operator. At the time Analysys Mason pointed to the UK as an exception to this problem. However, if the BT/EE merger proceeds, the UK will no longer be an "exception" and will instead be part of the problem:

"While the fixed incumbent operator may well have access to a fibre-based input as a matter of course, these inputs are not always made available to competing operators as a wholesale or retail product with the desired interface, quality, speed, or price. The fact that the required inputs are not available, or are extremely expensive, may dampen competition in the mobile market in some countries because the incumbent fixed operator is usually (with the exception of the UK) a major mobile operator and can gain benefits as a result of this vertical integration – specifically the much greater capillarity of their fibre network."⁵⁹

financial information from the preceding year, rather than by reference to regulatory financial statements. The control is proposed to apply from the second year of the charge control period to enable BT to adjust prices in the first year.

⁵⁷ See BCMR consultation paper (May 2015), paragraphs 10.18 to 10.29.

⁵⁸ See e.g. Phase 1 decision, para. 107.

⁵⁹ Analysys Mason, "Mobile backhaul market: Phase 1 report" (February 2014), page 3.

(I) Analytical framework

2.47 In general, a vertically integrated firm's incentives to foreclose depend on the extent to which foreclosure would be profitable. In particular, this depends on the trade-off between:

- (i) the sacrifice of wholesale profits, arising from reduced sales of the input following the quality decrease or price increase; and
- (ii) the gains from expanding retail sales, which occur if the vertically integrated firm's retail division is able to recapture (at least part of) the demand diverted away from downstream rivals by the raising of their costs directly or indirectly (e.g. through a decrease in the quality of service provided).

2.48 The trade-off between gains and losses is positive if the following relationship holds:

$$\text{Gains} > \text{Sacrifice if } B \times M_D > A \times M_U$$

Where:

- M_D indicates the downstream margins of the vertically integrated firm: in this case, these are the margins made by both EE and BT Retail in the supply of products (including bundles) that include mobile services, as explained below.
- M_U is the upstream margin, which in the present case is the margin BT makes on the sale of EAD LA/NLA, EAC LA/NLA and MEAS to MNOs.
- A is the proportion of Vodafone's subscribers no longer served using BT backhaul following the raising of rivals' costs.
- $B = C \times D$, where C is within market diversion, i.e. the proportion of Vodafone's subscribers diverted to other MNOs (including EE/BT) and D is the proportion of C that is diverted to the downstream business of the vertically integrated firm (BT/EE).

(II) Gain to EE and BT Retail downstream is likely to be substantial

2.49 First, BT/EE will be able to recapture a significant proportion of within retail market diversions from Vodafone (D). Even assuming that, hypothetically, BT does not increase the costs of other MNOs and assuming that retail diversions are proportionate to residual MNO market shares (i.e. market shares excluding Vodafone, see Table 2.2 below), EE would recapture [X]% of within market diversions from Vodafone.

2.50 Second, the within retail market diversion to BT/EE will be even greater if BT raises the costs of other MNOs simultaneously, given that all rival MNOs purchase backhaul inputs from BT. In this situation BT/EE will expect to recapture nearly all within market diversions given it is the only MNO that does not face a quality decrease or cost increase (D will be close to 100%, so BT will expect to recapture close to all of C).

Table 2.2
Subscriber and Residual Subscriber Market Shares (March 2015)

	Subscriber Market Shares	Residual Subscriber Market Shares
EE	[X]	[X]
O2	[X]	[X]
Three	[X]	[X]
Vodafone	[X]	[X]
MVNOs	[X]	[X]
Total	100%	100%

Source: Vodafone

2.51 The gain from a foreclosure strategy is further enhanced by the fact that retail margins (MD) over average customer lifetimes are likely to be high, because these will include not only the retail margins made by EE in the mobile market, but also retail margins on BT's triple- and quad-play bundles.

2.52 Therefore, post-merger the gain to BT from reducing quality and/or increasing prices would increase. In relation to quality, whilst the production cost that BT Openreach will save by reducing its quality will not change, reducing quality will provide BT/EE with extra revenue from customers who switch away from Vodafone and other MNOs to BT/EE at the retail level. Therefore for any given quality/cost trade-off pre-merger, the post-merger incentive to reduce quality will be greater.

(III) *Sacrifice to BT is likely to be minimal*

2.53 As noted above, "A" represents the proportion of Vodafone subscribers no longer served using BT backhaul following the implementation of foreclosure strategies. The smaller "A" is, the smaller BT's sacrifice of upstream profits will be.

2.54 In principle, this proportion may be greater than zero if: (i) Vodafone responds to the quality degradation or price increase by substituting from BT to alternative sources of backhaul; (ii) the quality degradation or price increase is passed through to the retail level and some subscribers substitute to other MNOs that use BT backhaul less intensively than Vodafone; and/or (iii) the quality degradation or price increase is passed through to the retail level and some subscribers leave the market altogether. However, for the following reasons this proportion is likely to be very small:

(i) First, for the reasons explained in paragraphs 2.26 to 2.28, Vodafone has limited ability to substitute BT backhaul for other inputs [X]. Therefore BT will not be concerned that it will be sacrificing upstream profits due to substitution by Vodafone to alternative sources of backhaul supply.

(ii) Second, Vodafone expects that if BT were to engage in foreclosure strategies *vis-à-vis* Vodafone (degrading backhaul quality or increasing backhaul prices) Vodafone will lose subscribers to other MNOs. But with respect to these

diverted subscribers, BT is likely to recapture most if not all of the derived backhaul demand related to these subscribers as BT is likely to supply backhaul to the other MNOs to a similar extent as it supplies backhaul to Vodafone (as noted at paragraph 2.25 above). As discussed above, other MNOs also have limited substitutes for BT backhaul, so even if BT also degrades backhaul quality or increases backhaul prices to other MNOs, the demand for BT backhaul is unlikely to be greatly affected. Therefore, BT is unlikely to experience much upstream sacrifice in relation to these diverting subscribers.

- (iii) Third, very few subscribers are likely to leave the market altogether, because the demand for mobile services is likely to be highly inelastic and subscribers will have the option of (at least) BT/EE as an alternative retail offering. Therefore there would be little or no sacrifice for BT in relation to subscribers that exit the market for mobile services.

For these three reasons, A is likely to be close to zero.

- 2.55 In addition, Vodafone's backhaul costs [X] of the total costs of its mobile business.⁶⁰ The smaller the proportion that the input cost represents in the value of the downstream product, the greater the incentive to foreclose. This is because the smaller the value of the input relative to the value of the downstream product, the smaller will be the absolute upstream margin (M_U) relative to the absolute downstream margin (M_D) and so the smaller will be the upstream sacrifice relative to the downstream gain, all else equal. This has previously been recognised by the European Commission and the General Court in *GE/Honeywell*⁶¹, and can be seen in the vertical arithmetic of how a vertical merger changes pricing incentives (see paragraphs 2.47 and 2.48).

(IV) *Conclusion on incentives*

- 2.56 Since BT stands to make substantial gains at the retail level from a raising rivals' costs strategy, and is unlikely to sacrifice much, if any, profit at the upstream level, it is likely that BT will find that it has incentives following the acquisition of EE to raise rivals' costs.
- 2.57 The vertically-integrated BT/EE will therefore have the ability and incentive to use its dominance in fibre backhaul provision to raise its rivals' costs and reduce its rivals' ability to compete, leading to a significant loss of competition on the market to the detriment of the customer. While Vodafone strongly agrees with the CMA's finding in its Phase 1 decision that the merged entity would be likely to have an incentive to foreclose rival MNOs by deteriorating the quality and/or increasing the prices of the backhaul services provided by BT Wholesale⁶², Vodafone considers that the merged entity would

⁶⁰ [X].

⁶¹ Case No. COMP/M.2220 *General Electric / Honeywell*, para.s 338, 419 to 427 and Case T-209/01 *Honeywell v European Commission*, para.s 294 to 300.

⁶² See e.g. Phase 1 decision, para. 123.

also be likely to have an incentive to engage in such strategies in respect of the backhaul services provided by BT Openreach.

- 2.58 BT/EE's ability and incentive to weaken the services provided by its competitors through degrading access to backhaul is compounded by the network sharing arrangements which exist in the UK (in particular since backhaul is a shared element within these arrangements). These factors reinforce the merged entity's ability and incentive to raise its rivals' costs, leading to marginalisation and foreclosure of competitors (see further Section 4).

(I) BT/EE will also have ability and incentive to engage in margin squeeze

- 2.59 In addition to having the ability and incentive to foreclose other downstream MNO competitors through deteriorating its fibre backhaul service, the combined BT/EE entity will also have the ability and incentive (for the reasons given above) to foreclose other MNOs by engaging in a margin squeeze strategy.⁶³

- 2.60 Even if BT keeps its wholesale terms for fibre backhaul products the same for all MNOs (including EE), it could still engage in a margin squeeze, due to the absence of any requirement on BT to ensure that EE makes a profit at the downstream level.⁶⁴ This would allow EE to undercut prices or offer additional quality at the retail level, without being constrained by the concern to make a certain margin that will be crucial to the other, non-vertically integrated MNOs.

- 2.61 BT/EE would be willing and able to do this even for regulated products because, although BT Openreach's EAD LA and EAD NLA products are regulated, the prices that BT Openreach charges for these inputs are not fully cost-oriented and are substantially above the incremental cost to BT Openreach of providing these products (in other words, there is substantial "fat" in the prices for these products). This can be demonstrated in at least the following ways:

- (i) The regulated prices are currently on "glide paths" towards cost oriented prices, with year on year price changes determined by RPI-12% (with current proposals to amend this to CPI-13.75%⁶⁵). This demonstrates that prices are currently significantly above costs.
- (ii) Ofcom allows BT Openreach considerable discretion as to how to recover common costs. It is evident from the pricing of different speed variants of EAD LA/NLA that BT Openreach recovers more common cost from higher speed

⁶³ Vodafone notes that this possibility was recognised by the CMA in its Phase 1 decision, although the CMA concluded that it was not necessary to assess the margin squeeze issue at that stage (see e.g. Phase 1 decision, para. 108).

⁶⁴ With the exception of where EE's mobile offering is included in any triple-play or quad-play bundles that include superfast broadband, which are subject to the VULA margin condition (see paragraph 5.6).

⁶⁵ Consultation paper for Leased Lines Charge Control (June 2015), Table 1.1.

variants, since the increases in price for higher speeds (which are more or less linear) bear no relation to the increases in incremental cost to BT Openreach of increasing the speeds (which simply involves modifications to the electronics on each end of the fibre). This demonstrates that prices for EAD LA/NLA include recovery of common costs and exceed incremental costs. It cannot therefore be assumed that the price of a regulated BT Openreach product is based on its fair share of common costs, direct costs or incremental costs.⁶⁶

- (iii) Ofcom's recent review of BT's cost attribution methodologies found that BT had made errors in allocating costs and had used inappropriate attribution methodologies that did not appropriately reflect the activities that cause the costs to be incurred – the effect of correcting these errors and changing the attribution rules could be to move costs of around £262m per annum away from regulated services.⁶⁷

2.62 When setting prices for EE's retail mobile services, a merged BT/EE will take into account the wholesale margin that will be earned by BT Openreach/BT Wholesale as well as the retail margin, enabling retail prices to be based on the underlying incremental costs of the fibre backhaul supplied by BT.⁶⁸ This raises the potential for margin squeeze in a number of ways:

- (i) EE may lower its retail prices without reducing the quality of service that it offers. If there is not a corresponding reduction in the prices that other MNOs must pay for fibre backhaul (either to BT Openreach or BT Wholesale) this may lead to a margin squeeze.⁶⁹
- (ii) EE may increase its quality by deploying more fibre backhaul without increasing retail prices. For example, consider a part of the country where all MNOs currently operate a "daisy chain" backhaul network, which involves microwave links between a number of mobile base stations and a single fibre backhaul link from just one of these base stations back to the core network. Post-merger,

⁶⁶ As a result of the transaction, BT will also have an enhanced ability to game its cost allocations: the acquisition of EE will increase the complexity of BT's business, with more costs requiring allocation and thus more costs capable of being allocated as "common". This will give BT an enhanced ability to allocate costs as it chooses (likely towards the regulated products required by its downstream competitors to raise their costs).

⁶⁷ See Ofcom, "Review of BT's cost attribution methodologies" Consultation Document (12 June 2015), para 1.12.

⁶⁸ The Kenny report recognised the fact that, post-merger, "an integrated network like BT/EE has access to 'owner economics' – that is, it can base its decisions on the marginal cost". It is precisely these "owner economics" that will allow BT/EE to engage in margin squeeze in order to weaken and foreclose its competitors, resulting in an SLC.

⁶⁹ Although normally a cost reduction resulting from a merger (such as the elimination of double marginalisation) would be seen as an efficiency of the merger, this is only the end of the story if the cost reduction concerns an input that is replicable. When the input is an essential input, as is the case for fibre backhaul, the fact that the BT/EE group as a whole may benefit from lower costs would not benefit consumers in circumstances where other MNOs would face an anti-competitively margin squeeze as they would be unable to compete with EE's retail prices when having to purchase the EAD or other fibre backhaul product.

BT/EE may decide to deploy fibre links to all of the base stations. This would increase the speed and quality of the mobile services that EE could provide, giving EE a substantial advantage in the market. Due to “owner economics”, the true incremental costs of this to BT/EE will be BT Openreach’s true incremental costs.⁷⁰ However, should any competing MNO (such as Vodafone) attempt to match this, it would have to pay the BT Openreach prices for EAD to each of the base stations, which are substantially above the BT Openreach incremental costs (as well as in all likelihood purchasing BT Openreach’s Project Service in order to minimise the risk of a poor quality service being provided by BT Openreach – see paragraphs 2.40(ii) and 2.43(ii)). Again, this may lead to a margin squeeze – it may no longer be profitable to replicate the speed and quality of service that EE provides without raising prices. If EE does not raise its retail prices to reflect the additional costs to other MNOs of buying the necessary BT Openreach EAD inputs to achieve that quality, there may be a margin squeeze.

- (iii) EE may engage in a combination of these strategies, lowering its retail prices while deploying more fibre backhaul and increasing its quality.

(J) Sectoral regulation does not prevent or address the SLC

- 2.63 Although Ofcom has an important role in overseeing and regulating certain aspects of the markets in which the BT/EE merger will result in an SLC, the CMA cannot rely on this sectoral regulation (or *a fortiori* any possible future revision to such sectoral regulation) to address the foreclosure concerns which arise with respect to backhaul as a result of the merger.
- 2.64 Existing sectoral regulation is potentially one of a number of factors that the CMA can take into account when conducting the competitive assessment as to whether the merger may result in an SLC. However, unless the existing sectoral regulation clearly prevents an SLC arising, the CMA must address the competition concerns under the Enterprise Act merger framework.⁷¹ It is clearly not the case that the sectoral regulation prevents an SLC resulting from the BT/EE merger, for the reasons given above.

⁷⁰ “Owner economics” are explained in the recent Kenny report (see pages 15-16 and 24). Kenny explains that a major benefit for BT/EE of the transaction will be the ability to face the true marginal costs of inputs such as backhaul, rather than having to pay the prices charged by BT (e.g. Openreach’s prices for EAD links) or EE (e.g. MVNO prices) for those inputs. Kenny explains “owner economics” in the context of BT being able to cheaply provide “top up” bandwidth for fixed broadband services by using the EE 4G network when needed at low (possibly zero) marginal cost, whereas competitors such as Sky or TTG (acting as MVNOs) may need to pay variable prices per MB to achieve the same capability. “Owner economics” will also apply in backhaul for mobile services.

⁷¹ This was recognised by the Office of Fair Trading in *LSE/LCH*. In considering the relevance of sectoral regulation, the OFT noted that it “*cannot be certain that the [Financial Services Authority] will be in a position to address all potential competition concerns raised, particularly where it is uncertain whether [the] complaint involves a matter of market integrity. The OFT does not rely in its decision on the current (or planned strengthened) regulatory framework alone to mitigate any competition concerns*” (emphasis added). In addition, in conducting its analysis of the merged entity’s ability to foreclose, the OFT considered that it “[could not] place wholesale reliance on a certain set of corporate governance provisions or a current or future regulatory framework given that these may be subject to

- 2.65 Furthermore, where the imposition of regulation has not been confirmed prior to the point at which the CMA is due to take a decision on a merger, then that proposed regulation cannot be relied upon by the CMA in order to address competition concerns arising from the merger. As the CMA will be aware, many of Ofcom's regulatory powers can only be exercised once Ofcom's duty to consult has been fulfilled. One of the purposes of consultation is to allow stakeholders an opportunity to make representations on why the regulator's proposals are not fit for purpose. As such, until the time a final decision is taken by Ofcom, it is entirely possible that the proposals which are the subject of the consultation will not be adopted wholly or at least in part. To suggest otherwise would effectively pre-empt the outcome of a consultation. Even after this stage, there is scope for BT to appeal Ofcom's regulatory decisions and this has often happened in the past; this further prolongs the period of uncertainty until any such appeals are determined.
- 2.66 On the contrary, where the CMA finds that a merger may give rise to an SLC, the CMA has a duty under the Enterprise Act to *"take such action...as it considers reasonable and practicable (a) to remedy, mitigate or prevent the substantial lessening of competition concerns; and (b) to remedy, mitigate or prevent any adverse effects which have resulted from, or may be expected to result from, the substantial lessening of competition."*⁷² The CMA cannot avoid this duty by relying on possible future changes to the regulatory regime under the Communications Act which may (or may not) be made by Ofcom.
- 2.67 More generally, the Communications Act framework is not designed to deal with mergers and merger-specific concerns. On the contrary, while the CMA's Guidance allows it to consult Ofcom about any mergers in which it is likely to have industry-specific knowledge, this Guidance clearly contemplates that the CMA's assessment in these situations must take place within the Enterprise Act framework.⁷³

3. SPECTRUM HOLDINGS

(A) Overview of competition concerns

- 3.1 In its Phase 1 decision the CMA considered generally the implications of the loss of horizontal competition at the retail level between BT and EE, although the CMA did not address explicitly the potential competition issues in relation to spectrum. Vodafone considers that the acquisition of EE by BT will also give rise to a SLC in the market for the retail provision of mobile voice and data services in the UK due to the impact of the merger on spectrum holdings.

change." See ME/5464-12 *Anticipated acquisition by London Stock Exchange Group plc of Control of LCH.Clearnet Group Limited* at paragraphs 142 and 155, full text of decision published 25 January 2013.

⁷² Section 41(2) Enterprise Act 2002.

⁷³ *Mergers: Guidance on the CMA's jurisdiction and procedure* (January 2014) at paragraph 2.17.

- 3.2 BT/EE will have an unmatched advantage in terms of its spectrum holdings. The combined BT/EE will hold c. [X] % of all 4G ready spectrum, providing it with significant spare capacity. Vodafone and the other MNOs will face significantly greater capacity constraints⁷⁴ with regard to spectrum thereby constraining their ability to compete effectively with EE. In the counterfactual, BT would likely have used its full spectrum capacity in providing a competing retail offering. By contrast, post-merger BT/EE would have the ability to offer superior speed and capacity but would either have little incentive to do so (i.e. would hoard its additional unused 4G ready spectrum) or would only do so at significantly higher prices compared to the counterfactual absent the merger. This will lead to less choice, higher prices and lower quality for retail consumers.
- 3.3 This section first provides an overview with respect to spectrum, setting out the current position in the UK and in particular EE's already substantial lead in coverage, speed and capacity relative to other MNOs. The section then addresses how the combination of BT and EE will lead to a SLC in retail mobile and data services as a result of BT/EE's post-merger incentives to act as a residual monopolist.

(B) Background

- 3.4 In order to operate an MNO needs two basic inputs: a mobile network and authorisation to use spectrum band(s) for mobile telecommunications. Spectrum is the means through which mobile devices communicate with the MNO's base stations which are in turn connected to its core network via backhaul.
- 3.5 Spectrum is part of a Member State's public property. In the UK Ofcom is entitled to allocate temporary spectrum licences to MNOs to use specific spectrum bands dedicated to mobile telecommunications. Such licences are awarded by means of spectrum auctions.
- 3.6 Frequencies dedicated to mobile telecommunications are generally used in paired format by MNOs in order to ensure transmission of the uplink (from the device to the mobile site) and the downlink (from the mobile site back to the device) on non-adjacent but nearby frequencies.⁷⁵ The potential capacity of an individual mobile site is limited by the volume of spectrum that a MNO has the right to use, and the mobile technologies that the MNO wishes to support at that location.
- 3.7 Mobile networks are based on different generations of technologies.⁷⁶ The earliest digital technology still in use is the second generation of mobile telephony ("2G") or

⁷⁴ i.e. constraints on the total amount of data that an MNO can transmit (at a given time and in a given location) and also the total number of subscribers it can supply at a given level of quality (which largely equates to speed).

⁷⁵ This is known as "Frequency Division Duplexing" ("FDD"). Most additional future mobile spectrum will be released in an alternative use model, "Time Division Duplexing" ("TDD"), where there is no pairing and the same frequency is used for both the uplink and the downlink.

⁷⁶ Although generally mobile devices are backwards compatible, i.e. a 4G device will be compatible with 3G and 2G but a 2G device will only be compatible with 2G.

GSM which was widely deployed in the late 1990s. 2G was essentially focused on voice and SMS communications. Later enhancements to 2G (e.g. EDGE) could also support the exchange of data but at limited speed (equivalent to narrowband or at best a very slow broadband speed) and at considerable detriment to voice capacity. The 900 MHz and 1800 MHz bands have primarily been dedicated to 2G communications in the EU, although sufficient spare capacity has also become available in the 1800 MHz band to allow it to be used for 4G.

- 3.8 In the 2000s the third generation of mobile telephony (“**3G**”) was deployed by MNOs. In the EU, the 2.1 GHz frequency band has generally been used for this purpose, although more recently, the 900 MHz band has also become available for 3G. 3G technology applies roughly equal focus to the provision of both voice and data and as a result can offer data speeds comparable to slow/average broadband connections.
- 3.9 In the late 2000s and 2010s, the fourth generation of mobile telephony (“**4G**”) or LTE has become available for deployment. 4G was specifically designed for maximising mobile data throughput. While 4G is more spectrally efficient than 3G (in terms of the bits per second of data that can be transmitted per unit of spectrum deployed), the most important element of 4G for present purposes is that the addition of more spectrum to an existing 4G service will give a linear increase in speed and capacity.⁷⁷ If sufficient spectrum is deployed, 4G can therefore deliver a high speed data experience equivalent to very high speed fixed connections.⁷⁸
- 3.10 In the UK and the rest of Europe, 4G deployment has been largely confined to three bands. As explained in paragraph 3.7 above, sufficient spare capacity has become available in the 1800 MHz band to allow it to be used for 4G. In addition, the newly-released 800 MHz and 2.6 GHz bands, both of which had no legacy mobile use, have been made available to operators for 4G use. As a result, handset manufacturers have developed their European 4G devices to support these three bands in particular.⁷⁹

⁷⁷ This is also possible to some limited extent with later variants of 3G e.g. Dual Carrier High Speed Packet Access.

⁷⁸ By way of example, EE launched 4G in October 2012 with sites having 2 x 10 MHz of spectrum in 1800 MHz band dedicated to 4G. This gives a theoretical maximum throughput to a single user in a cell of 75 mbps. By July 2013, EE was able to double the 4G spectrum in use to 2 x 20 MHz, which gives a theoretical maximum throughput of 150 mbps (branded by EE as “double speed 4G”). At the end of 2014, EE announced the deployment of the simultaneous use of 2 x 20 MHz of 1800 MHz and 2 x 20 MHz of 2.6 GHz in the same cell and has suggested that this will give “quadruple speed 4G”: the theoretical maximum throughput of this is 300 Mbps. Although it is unlikely that these theoretical maxima will actually be available to any user, EE’s nomenclature provides a useful understanding of the indexed increase in capacity and user speeds that is available from the deployment of greater 4G spectrum quantities.

⁷⁹ Different spectrum frequencies have differing propagation characteristics. In particular, frequencies above 2 GHz offer less area coverage than lower frequencies, so MNOs tend to use the lower frequencies to provide a wide area coverage network. In the UK, for example, MNOs have used the 1800 MHz and 800 MHz bands to provide 4G coverage. Additional 4G ready spectrum, specifically 2.6 GHz, is then used to provide both additional capacity and speed for 4G users. While both the 900 MHz and 2.1 GHz bands are specified in the relevant standards as capable of being used for 4G, there is at present very limited use of these bands for this purpose in Europe. The principal reason for this is that the limited volume of spectrum in each of these bands is already occupied by legacy 2G and 3G

- 3.11 As explained in further detail in paragraphs 2.9 to 2.14 above, increasing data demand means that MNOs need to be able to offer an effective 4G network to meet their customer's data requirements at both (i) the individual user level, i.e. the throughputs that can be achieved to allow prompt and effective delivery of services required by the user, e.g. high definition video; and (ii) the aggregate level, to ensure that the sum of all individual users' simultaneous demands in an area can be accommodated by the capacity of a given mobile site. If demand is greater than capacity, all data users would experience a degradation in the quality of service (unlike voice, where only the incremental user would be unable to place a call).
- 3.12 A larger spectrum portfolio provides more capacity to operators that can be used either to (i) serve a larger number of simultaneous users at a certain level of data transfer speed; or (ii) increase the speed experienced by a given number of subscribers. [REDACTED].⁸⁰ Of course, the additional capacity offered by the spectrum would only be useful if backhaul capacity is increased commensurately so that it is capable of dealing with the additional demand.

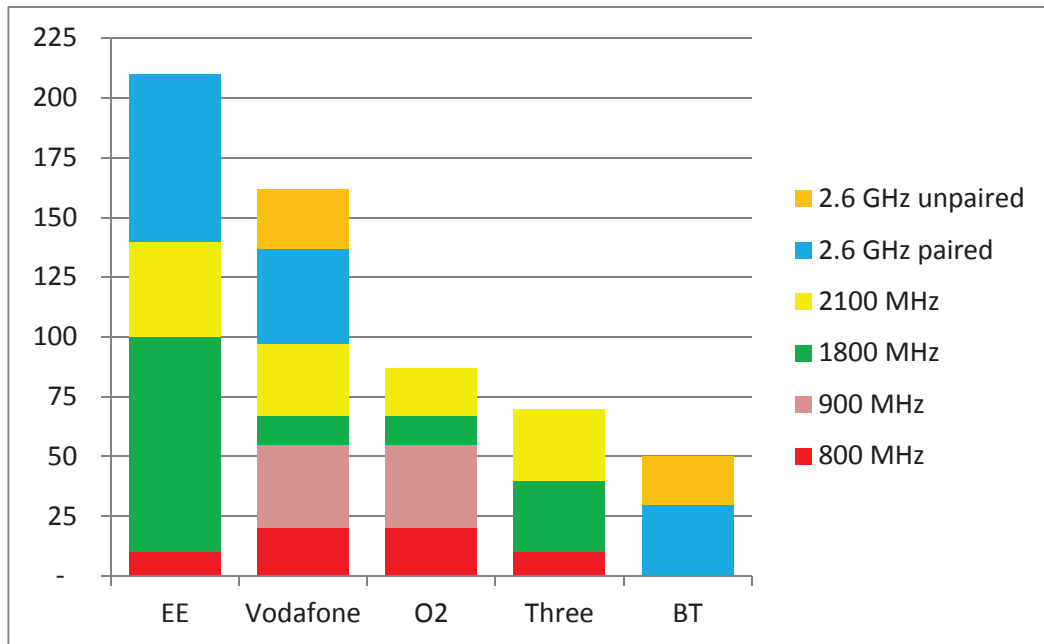
(C) Current position

- 3.13 Spectrum in the UK is currently held as follows by the four MNOs and BT:

services. With this knowledge, handset manufacturers have focussed their 4G design efforts on supporting the 800 MHz, 1800 MHz and 2.6 GHz bands rather than 900 MHz and 2.1 GHz.

⁸⁰ [REDACTED].

Figure 3.1
UK MNOs' (and BT's) current spectrum holdings in MHz



Source: Ofcom

- 3.14 As can be seen from Figure 3.1, EE already enjoys a significant lead in spectrum holdings (in terms of absolute volumes). In addition, when one strips out the bands currently employed for legacy 2G and 3G services (which cannot be used for 4G services in the near- to mid-term) and considers only “4G ready” spectrum (i.e. the 800 MHz, 1800 MHz and 2.6 GHz paired bands), EE has a very significant volume advantage, as shown in Figure 3.2 below.

Figure 3.2

[Image placeholder]

[Image placeholder]

This spectrum advantage provides EE with a number of benefits, as set out below.

(i) *EE's coverage in 4G relative to other MNOs*

- 3.15 EE was the first MNO to launch 4G services following its creation as a result of the merger of T-Mobile and Orange in 2010. Following the merger the parties combined their spectrum allocations, thus creating surplus 1800MHz spectrum not required for 2G services and enabling EE to launch 4G in October 2012. This was significantly before any other operator (Vodafone and O2 launched nearly a year later, in August 2013 as

81 [Image placeholder].

they could only launch 4G with the spectrum they purchased in the March 2013 auction) and much earlier than communicated to the European Commission as a likelihood during the latter's merger review.⁸² The Kenny report notes that according to the GSM Association: "*The merger allowed EE to roll-out LTE faster than either Orange or T-Mobile would have been able to do absent the merger...*"⁸³ EE's head start was thus enabled by spare spectrum already in the parties' possession pre-merger and has given it a substantial coverage advantage, as illustrated by Figure 3.3 below.

Figure 3.3
4G premises (outdoor) coverage, June 2014 and October 2014

	O2	Vodafone	EE	Three
June 2014	43%	37%	68%	N/A
October 2014	51%	51%	70%	N/A
Increase in coverage (percentage points)	8%	14%	2%	N/A

Source: Ofcom analysis of MNO data, Infrastructure Report 2014

- 3.16 As is apparent from Figure 3.3, EE is still further ahead in terms of its 4G coverage deployment than the other MNOs and intends to stay ahead for several years. In February 2015, EE's CEO Olaf Swantee announced that "*We will also further expand our 4G network so that it covers more areas than existing 2G networks, and we will do so at a pace far outstripping our rivals. We will achieve with coverage what we have with mobile speeds: deliver beyond our customers high expectations*"⁸⁴.

(II) *EE's speed and capacity relative to other MNOs*

- 3.17 As discussed in paragraph 3.12 above, the greater a MNO's spectrum holdings, the higher the speed and capacity it can offer.
- 3.18 As can be seen from Figure 3.1 and 3.2 the volume of spectrum (and in particular 4G ready spectrum) held by EE sets it apart from the other MNOs active in the UK:

⁸² See Case No. COMP/M.5650 *T-Mobile / Orange*. This is also apparent from Ofcom's responses to a request made under the Freedom of Information Act 2000 (available at <http://stakeholders.ofcom.org.uk/freedom-of-information/foi-responses/2012/April2012/1-203896858/>).

⁸³ Kenny report, p.15, quoting from GSMA, European mobile network operator mergers: A regulatory assessment, December 2014

⁸⁴ See <http://ee.co.uk/content/dam/everything-everywhere/Newsroom/PDFs%20for%20newsroom/Signalling%20the%20Future.pdf>.

- (i) EE already holds 39% of all available paired spectrum, as compared with 26% held by Vodafone, 16% by O2 and 13% by 3.
- (ii) Looking at 4G ready spectrum separately, EE's current share jumps to [X]%, as compared with [X]% for Vodafone, [X]% for 3 and [X]% for O2.

3.19 Furthermore, EE has not used all of its 4G ready spectrum holding. At the end of 2014, EE announced the deployment of the simultaneous use of 2 x 20 MHz of 1800 MHz and 2 x 20 MHz of 2.6 GHz in the same cell and has suggested that this will give "quadruple speed 4G" with a theoretical maximum throughput of 300 Mbps.⁸⁵ This total of 80MHz can be contrasted with EE's total 4G ready spectrum holding of [X] in Figure 3.2 above. EE's deployment of only a proportion of its 4G ready spectrum holdings has already given it substantial speed and capacity advantages. In February 2015, RootMetrics, a company which specialises in collecting and disseminating mobile network performance information to consumers and the industry, stated that:

*"EE once again proved to be the most impressive mobile network when looking at performance across the entirety of the UK. In this round of testing, EE finished atop each of our six categories of testing: The network won five of our six categories outright and tied for first with Three in our reliability testing. EE, which had an early start on its 4G rollout, was especially strong in our network speed testing, clearly distancing itself from all other operators."*⁸⁶

3.20 EE's marketing concentrates on the speed, coverage and reliability of its mobile network and its superior 4G network, which demonstrates its view of the importance of perceived network quality (including speed and capacity) in customers' choice of retail mobile provider. While customers are attracted to its network speed, EE is capable of making these assertions because of its leading position in terms of 4G ready spectrum capacity. The speed and capacity advantages of EE's network have also been at the forefront of public statements made by Mr Swantee. In February 2015 he stated that:

*"And here we are, three years on, with EE now boasting the world's fastest 4G, the fastest 4G uptake in Europe (making it Europe's largest 4G operator), a world-leading dropped call rate, and a network that is consistently named number one by anyone that cares to measure it properly. Even Ofcom's own network reports last year saw EE named as the best UK mobile provider."*⁸⁷

3.21 There are limited options available to MNOs to increase capacity and speed [X]:

⁸⁵ See e.g. http://www.4g.co.uk/4g-news/operators/ee-trials-4g-20-times-faster-3g_30015947.html.

⁸⁶ RootMetrics, "2nd Half 2014 UK Mobile Network Performance Review" (available at <http://www.rootmetrics.com/uk/blog/special-reports/year-in-review-2014-uk>).

⁸⁷ See <http://ee.co.uk/content/dam/everything-everywhere/Newsroom/PDFs%20for%20newsroom/Signalling%20the%20Future.pdf>.

- (i) Obtain more spectrum: Ofcom is due to auction 40 MHz in the 2.3 GHz band and 150 MHz in the 3.4 GHz band in early 2016. [...] the availability of this spectrum to any individual MNO is necessarily uncertain; both bands are TDD (i.e. unpaired spectrum) and, to date, TDD spectrum has not been widely used for mobile data services in Europe; the 2.3 GHz band is not currently supported by many mobile handsets in Europe (and this is unlikely to change until well after the auction has taken place); [X] (it is similarly not supported by many mobile handsets in Europe) [X]⁸⁸. [X]⁸⁹ There is also a planned private sale by Qualcomm of 40 MHz of 1400 MHz spectrum in 2015, [X] and is thus similarly of very limited short and medium term utility to MNOs for 4G [X].
- (ii) Build more sites: the alternative to more spectrum where demand exceeds current capacity is more network cost. i.e. building new mobile sites to reduce the area covered by existing mobile sites [X]⁹⁰. [X] operators with low spectrum holdings face higher marginal costs of adding capacity: building additional mobile sites is costly (c. [X] per site in capital cost and [X] in annual operating costs) and requires significant time (12-18 months). [X]⁹¹

3.22 Another option for expanding network capacity is to re-farm the use of existing spectrum holdings. [X] Re-farming is a slow and difficult process – unless large quantities of spectrum are free in a given band, providing immediately available spare capacity, care must be taken to ensure that the experience of current customers using devices that are only capable of deploying legacy technologies is not impaired (new devices are backwards compatible, i.e. they can revert to more historic technologies, but legacy devices are not forward compatible, i.e. they cannot utilise newer technologies such as 4G). [X]

3.23 Vodafone submits that there are limited options available to other MNOs to increase quality and speed [X]⁹². [X].⁹³

(D) Combination of BT and EE will lead to a SLC in mobile voice and data services

3.24 The negative impact of the combination of BT and EE's spectrum holdings results from a number of different ways in which this combination will affect competition in retail mobile services.

88 [X].

89 [X].

90 [X].

91 [X].

92 [X].

93 [X].

- (l) *Addition of BT's spectrum to EE's current holdings will further enhance EE's advantage in 4G*
- 3.25 The acquisition of EE by BT will further compound EE's leading position: the merged entity will hold 45% of all paired spectrum and [X]% of all 4G ready spectrum.
- 3.26 As explained in paragraph 3.12 above, increased spectrum holdings will give the merged entity further speed and coverage advantages as compared to the other MNOs, in particular with respect to 4G services.⁹⁴ The merged BT/EE entity will also benefit from increased flexibility in terms of the deployment of its spectrum, through its enhanced ability to benefit from, e.g.:
- (i) Carrier aggregation (the simultaneous use of multiple frequency spectrum bands, enabling maximum speeds using their combined capacity);
 - (ii) The successful installation of small indoor and outdoor cells (i.e. cells with smaller coverage areas) into macrocells (with larger coverage areas) to add capacity by using spectrum bands of different frequencies (other MNOs, such as Vodafone, do not have sufficient spectrum capacity to use different frequencies, as interference and other technical problems can arise when available spectrum is limited);
 - (iii) LTE Broadcast (eMBMS) (i.e. the ability to offer live broadcast TV services on mobile devices): the 2.6 GHz band is well-suited to this.
- 3.27 In addition, BT's spectrum is in the same band that EE is using for 4G services, so the merged entity will suffer no device disadvantage.
- 3.28 Given the combination of rival MNOs' spectrum capacity constraints and BT/EE's substantial spectrum advantage, BT/EE will not be effectively constrained by the other MNOs. Furthermore, far from enjoying compensatory (non-spectrum) advantages, other MNOs will have to endure exacerbating disadvantages that further limit their ability to compete with a combined BT/EE entity, such as the supply of mobile backhaul (see Section 2 above), [X].
- 3.29 Vodafone notes in this regard that in *T-Mobile/Orange*, the European Commission recognised the concerns arising from further spectrum concentration as regards the roll out of 4G services in the UK and required spectrum divestment to address this.⁹⁵

⁹⁴ [X]. NB: these figures include all of the 1800 MHz spectrum that EE was required to divest to 3 on its creation following the European Commission's decision in *T-Mobile/Orange*, although 2 x 5 MHz of this will not be divested until October 2015 and EE can therefore use it until that time.

⁹⁵ See Case No. COMP/M.5650 *T-Mobile / Orange*, para.s 111, 128, 138, 227: "*Following the operation, T-Mobile and Orange would hold a combined amount of contiguous spectrum at the 1800 Mhz frequency level significantly larger than their competitors [...] The parties will be able to offer superior network quality in terms of maximum download speed, and potentially also in terms of consistency of provision of lower download speeds. The parties will also have*

(II) *Post-merger incentives for BT/EE to act as a residual monopolist*

- 3.30 In light of the significant increase in BT/EE's spectrum holdings, and the considerable spectrum constraints faced by other MNOs relative to BT/EE, in particular in relation to 4G ready spectrum, BT/EE will have the incentive to act as a residual monopolist, restricting its output and raising prices or reducing quality.
- 3.31 In the relevant counterfactual to the merger, BT would be active in providing a retail mobile offering in competition with the MNOs, using its own spectrum in some areas and roaming on EE's network in others.⁹⁶ In light of its limited spectrum holdings, BT would likely have used its full spectrum capacity and would have continued to undercut the prices set by the MNOs in order to compete. This would have left the existing MNOs competing to supply the residual demand left over after the full utilisation of BT's capacity.
- 3.32 Compared with this counterfactual, the BT/EE merger removes BT as an independent competitor and instead enhances EE's spectrum holdings. Post-merger, the MNOs will therefore compete to supply the full market demand, but in circumstances where:
- (i) BT/EE is relatively unconstrained in its spectrum capacity;⁹⁷
 - (ii) Vodafone, O2 and 3 are all spectrum constrained (see paragraphs 3.21 to 3.23).
- 3.33 The likely outcome is that Vodafone, O2 and 3 will utilise all of their spectrum capacity to serve retail and wholesale customers, while BT/EE will not. BT/EE would hoard its additional unused 4G ready spectrum (~~€~~)⁹⁸. BT/EE will therefore be able to act as a

a significant time advantage due to the uncertain timing of the auction and the time to clear the sub 1 GHz spectrum. In addition, the 2600 MHz spectrum presents lower coverage performance compared to the 1800 Mhz spectrum, which makes it hardly suitable for areas other than urban [...] [The Commission] identified prima facie serious doubts as to the merger's compatibility with the common market in relation to the wholesale and retail telecommunications markets over the next few years as a result of the 1800MHz band spectrum concentration deriving from the merger [...] [and concluded that] the divestment of 2x15 MHz of 1800 MHz spectrum would be a better solution and still sufficiently clear-cut to address the competition concerns: by acquiring such amount of spectrum, O2 or Vodafone could develop independently a 2x15 MHz or even a 2x20 MHz network that could effectively compete with the JV's network on equal grounds."

⁹⁶ BT originally planned to re-launch its mobile network for business by August 2014, and re-enter the consumer market by April 2015, using its spectrum to create its network by upgrading customers' Home Hub equipment to broadcast 4G as well as Wi-Fi signals.

⁹⁷ It should be noted that even if (*quod non*) pre-merger, EE was as capacity constrained as Vodafone, O2 and 3, the merger would still result in an increase in price. In such circumstances, all MNOs would price at a level where demand equals total capacity. Post-merger, because BT/EE has greater capacity than the other MNOs, BT/EE may again have the incentive to restrict output, thus acting as a residual monopolist.

⁹⁸ Whilst the cost of deploying additional spectrum is relatively low, the cost of using that additional spectrum to increase the number of subscribers that can be provided with a given data transfer speed, or to increase the speed experienced by a given number of subscribers, may still be material. In order to offer increased speeds, MNOs need to invest in additional equipment and may also need to invest in backhaul capacity. The incremental cost of using additional spectrum to improve network quality for end users therefore needs to take account of these costs.

residual monopolist, raising its price relative to the price that it would have charged had it been using all its capacity.

3.34 This concern has been raised by both the Competition Commission and the European Commission in previous cases:

(i) In *British Salt/New Cheshire* (2005), the Competition Commission was concerned that an elimination of a fringe firm's salt capacity would result in higher prices: "the *elimination of such a fringe firm appears to the core firms to be equivalent to an exogenous increase in demand, to which they would be expected to respond by increasing prices*".⁹⁹

(ii) In *Outokumpu/Inoxum* (2012), the European Commission expressed the same concern.¹⁰⁰

3.35 The consequences of the above will be a "bifurcation" of the retail mobile and data services available to UK consumers relative to the counterfactual, with BT/EE having the ability to offer superior speed and capacity but either having little incentive to do so, or only doing so at significantly higher prices compared to pre-merger.

3.36 In such an outcome, any synergy benefits of the merger will accrue to BT/EE rather than to consumers through price reductions or service improvements, with longer term harm to consumers resulting from weakened competitors and lack of any competitive constraint on the dominant player.

(E) Conclusion

3.37 The combination will therefore give rise to a SLC in retail mobile voice and data services as a result of the combination of BT and EE's existing spectrum holdings.

4. NETWORK SHARING

(A) Overview of competition concerns

4.1 The merger also gives rise to serious concerns in relation to network sharing, a key feature of the UK market. [REDACTED].

4.2 [REDACTED]. The CMA should consider the combined implications of the 3/O2 merger and the BT/EE merger as part of its assessment of the BT/EE merger.

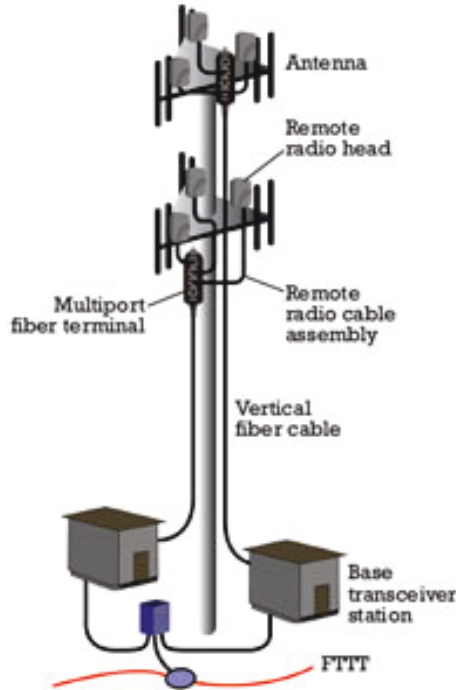
⁹⁹ *British Salt / New Cheshire* (2005), para. 5.109. Indeed, the Competition Commission found that the fact that New Cheshire was capacity constrained did not prevent NCSW from competing effectively in the relevant market.

¹⁰⁰ Case COMP/M.6471, *Outokumpu / INOXUM* (November 2012), Annex IV.

(B) Background

- 4.3 As described at paragraph 2.7 above, a mobile network is comprised of a number of mobile sites, which each feature a mast with an antenna and a radio-frequency system, linked to a core network via backhaul connections. Each mobile site covers a limited area and has a maximum capacity. The capacity of a mobile site depends upon the installed equipment on the site and the quantity of spectrum frequencies a particular MNO has the right to use.

Figure 4.1
Structure of a mobile network site



Source: Lightwave (<http://www.lightwaveonline.com/articles/print/volume-28/issue-5/applications/fiber-reaches-the-antenna.html>)

- 4.4 In a network sharing arrangement, MNOs agree to share parts of the RAN equipment, sites and/or transmission network (connecting radio sites to each other and to the rest of the MNO's network) in order to reduce costs and improve coverage.
- 4.5 The extent of integration varies since MNOs may agree to share different parts of their network equipment, although the arrangements will typically involve either "passive" or "active" sharing.
- 4.6 With passive sharing towers, cabins and (if relevant) power supplies are all shared. Active sharing also involves the sharing of RAN equipment, i.e. the node B processing

equipment, radio network controller and base station controller.¹⁰¹ Transmission (i.e. backhaul) may be shared under passive or active sharing arrangements. While it is also possible for MNOs to integrate further and share spectrum, there are no such arrangements in place in the UK.

- 4.7 Network sharing gives rise to many benefits in terms of cost savings and also provides the incentive and basis for further infrastructure investment, particularly in less densely populated rural areas. By eliminating duplication of base station infrastructure, passive network sharing allows for a decrease in the costs of operating and maintaining passive assets. It reduces the number of sites required, allowing for fixed cost savings on rent and power, in addition to reducing the cost for the MNOs of acquiring and developing new sites.¹⁰² Active RAN sharing gives rise to additional cost savings on RAN and benefits in relation to the roll out, operation and maintenance of a single RAN. Network sharing thus enables faster roll out of coverage and therefore more timely availability of services. These benefits have been acknowledged by both the UK government and Ofcom.¹⁰³
- 4.8 The European Commission has also recognised the importance of network sharing agreements to individual MNOs in its assessment of the recent *T-Mobile/Orange UK* and *Hutchison 3G/O2 Ireland* cases, noting in both that disruption of network sharing to the detriment of one of the participating MNOs can lead to a significant negative impact on competition.¹⁰⁴

(C) Network sharing in the UK

- 4.9 There are currently two separate network sharing arrangements in place in the UK:
- (i) Mobile Broadband Network Limited (“**MBNL**”), a 50/50 JV between EE and 3 formed in 2007, which provides for full active sharing in relation to 3G and passive sharing in relation to 4G. Under MBNL, individual sites are held jointly

¹⁰¹ RAN sharing requires that the equipment is compatible on shared sites: in practice this means that participating MNOs will use the same equipment supplier.

¹⁰² In addition to these savings, there are also wider socio-economic benefits, such as reduced impact on the environment.

¹⁰³ For example, the UK government’s initiative to increase mobile coverage in rural areas relies on the existence of network sharing arrangements and Ofcom’s 2014 Infrastructure Report recognises that the purpose of network sharing agreements is to reduce costs and increase coverage.

¹⁰⁴ See Case No. COMP/M.5650 *T-Mobile / Orange*, paras 105 and 108: “*The parties, post-merger, might have the incentive to early terminate, or more likely, to compromise the functioning of the existing 3G RAN sharing agreement to the detriment of 3UK [...] the possible disappearance of 3UK or the degradation of its competitive position could consequently have a serious impact on the UK retail mobile communication market.*”

See also Case No. COMP/M.6992 *Hutchison 3G UK / Telefonica Ireland*, Statement of Objections, paras 331 and 337: “*The merger is likely to reverse O2’s pre-merger incentive to actively implement the Mosaic agreement [...] a frustration or termination of that agreement would impair Eircom’s ability to compete and would lead to less competition on the Irish markets for retail and wholesale mobile communications.*”

by EE and 3. Vodafone understands that the passive assets are therefore also owned by a combination of EE and 3 and that MBNL purchases backhaul on behalf of EE and 3. Vodafone also understands that 3 does not have access to all of EE's sites (e.g. some ex-Orange sites which were contributed at time of the T-Mobile/Orange UK merger).

- (ii) Cornerstone Telecommunications Infrastructure Ltd ("**CTIL**"), a 50/50 JV between Vodafone and O2 formed in 2012, which provides for (i) passive sharing through an incorporated joint venture (CTIL)¹⁰⁵; and (ii) contractual active sharing [REDACTED].

4.10 As a result of these network sharing arrangements, the UK is currently served by two infrastructure grids, upon which operate four distinct and differentiated mobile networks.

(D) Standalone impact of BT/EE

4.11 As can be seen from Table 4.1 below, EE is currently the largest MNO in the UK in terms of number of subscribers, with c. [REDACTED]% of the market. EE also has the biggest network (22,000 sites, more than 17,000 of which will be shared when MBNL is complete¹⁰⁶). In addition, as explained in paragraph 3.25, it has the largest allocation of 4G spectrum.

Table 4.1
Network Level Subscriber Market Shares (March 2015) (where MNO figures include MVNO subscribers on the same network)

	Subscribers (000s)	Share (%)
EE	[REDACTED]	[REDACTED]
O2	[REDACTED]	[REDACTED]
Three	[REDACTED]	[REDACTED]
Vodafone	[REDACTED]	[REDACTED]
Total	[REDACTED]	100%

Source: Vodafone

4.12 BT also already has significant network advantages (notably, its control of fibre backhaul, as discussed in Section 2 above, but also access to exchange rooftops, small cells on street furniture, WiFi offload and an installed base of Home Hubs). For instance, Vodafone understands that:

¹⁰⁵ The creation of CTIL was cleared by the Office of Fair Trading: see Case ME/5556/12 *Anticipated joint venture between Vodafone Limited And Telefónica UK Limited* (2012).

¹⁰⁶ See e.g. <http://mbnl.co.uk/our-shareholders/>.

- (i) BT has an unmatched portfolio of at least 2,200 local exchange rooftops which it has reserved to itself: other MNOs are required to negotiate terms with and can only gain access via Arqiva acting as BT's agent. These terms are likely to be significantly less favourable than those BT would apply to EE. BT could also increase EE/MBNL's footprint using more of its 5,600 exchanges and/or street furniture and telephone poles;¹⁰⁷
- (ii) BT's market leading position in fixed superfast broadband has enabled it to build up the largest UK WiFi network (with more than 5 million hotspots) by reserving capacity on every BT Home Hub. No other mobile operator has access to such a subscriber base. This could significantly improve BT/EE's network speed and capacity (in addition to the spectrum advantages already described) as BT could use femtocell technology in these Home Hubs (in conjunction with some of its 4G spectrum) to offload traffic to (an effectively costless) WiFi network from its mobile network.

[X]. These incomparable advantages, have already been recognised in the Kenny report, which explains that "*certain experimental technologies which may dramatically increase spectrum efficiency are particularly well suited to converged operators*" as they combine multiple small transmitters with overlapping coverage with wireless operators providing multiple widespread locations with connectivity where such small transmitters could be located. As the report notes, "*BT's estate of millions of routers on customer premises represents just such capillarity [...] thus a converged player such as BT/EE could be well placed to deploy such technology.*"¹⁰⁸

4.13 [X].

(E) Combined impact of BT/EE and 3/O2

- 4.14 Any assessment by the CMA of the BT/EE transaction should also be viewed in the context of the proposed acquisition of O2 by 3, which is expected to be completed in the second quarter of 2016. The CMA has already recognised the unconditional clearance of this transaction as a parallel transaction and "*the most appropriate counterfactual*" in its reference decision at Phase 1¹⁰⁹; Vodafone agrees with this assessment and believes that this continues to be relevant for the CMA's Phase 2 analysis.
- 4.15 The Merger Assessment Guidelines note that in Phase 2 the CMA may examine several alternative scenarios before choosing the most likely as the counterfactual. The CMA should therefore address the combined effects of the parallel BT/EE and 3/O2 mergers

¹⁰⁷ Similarly to the issues discussed in Section 2 above in respect of mobile backhaul, any existing regulation which might require BT to offer the same terms to other MNOs would be ineffective as this constitutes a transfer price only for BT, but imposes a real cost to other operators.

¹⁰⁸ Kenny report, p. 18.

¹⁰⁹ Phase 1 decision, para. 45.

as part of its examination of the counterfactual – or alternatively as part of its competitive assessment.¹¹⁰ If the CMA were not to do this, there is a real risk that the competitive effects of the combination of the two transactions in the UK will not be properly addressed.

4.16 The issues identified are exacerbated if the 3/O2 merger also goes ahead. The CMA should consider the combined implications of the BT/EE merger and the O2/3 merger as part of its assessment of the BT/EE transaction [X].

4.17 [X].

4.18 [X].¹¹¹ [X].

4.19 [X]:

(i) [X];

(ii) [X]

(iii) [X].

4.20 [X].¹¹² [X].

4.21 [X].

4.22 As explained in paragraph 4.8, the European Commission has previously identified serious competition concerns resulting from the impact of mergers in terms of undermining existing network sharing agreements. The Commission has put in place remedies to ensure that the network sharing arrangements post-merger continue to allow for effective network competition.

4.23 [X].

(F) Conclusion

4.24 [X].

4.25 [X].

¹¹⁰ See “*Merger Assessment Guidelines*” (September 2010), para.s 4.3.2 to 4.3.7 (originally published jointly by the OFT and CC and adopted by the CMA board).

¹¹¹ [X].

¹¹² [X]

- 4.26 The CMA's review of the BT/EE merger (including the combined effects of the BT/EE and 3/O2 mergers) must ensure that all MNOs have a competitive cost base and the ability to compete against each other on a long-term basis.

5. TRIPLE-PLAY AND QUAD-PLAY PACKAGES

(A) Overview of competition concerns

- 5.1 In order to supply triple-play or quad-play packages, Vodafone is reliant on BT to provide the superfast broadband element. Following the merger, BT will have the ability and enhanced incentive to foreclose Vodafone's access to essential wholesale inputs to superfast broadband in order to restrict Vodafone's ability to compete with the BT/EE group's triple-play and quad-play offerings.

(B) Background

- 5.2 There is a growing trend in communications markets towards bundled "multi-play" offers. The first to emerge were those combining fixed voice and broadband (referred to as "**dual-play**"), with the subsequent addition of either television services or mobile services ("**triple-play**") and, most recently, the bundling of all four of these services ("**quad-play**").¹¹³
- 5.3 The trend towards quad-play in the UK has been increasing and analysts believe that the BT/EE merger will only speed up the transition to competition for quad-play bundles, as the merged BT/EE entity will combine EE's mobile network with BT's fixed voice, broadband and television assets, allowing it to develop its own quad-play packages,¹¹⁴ as well as increasing BT and EE's market shares in both superfast and standard broadband.¹¹⁵ BT's Chief Executive Gavin Patterson has stated that: "*the integrated company would be in a better position to offer bundled services*"¹¹⁶ The launch of BT's

¹¹³ See e.g. Case No. COMP/M.6990 *Vodafone / Kabel Deutschland*, para. 260.

¹¹⁴ See e.g. the Wall Street Journal, "*Quad-play may not be all square for U.K. Telecoms*" (10 February 2015): "*The move will kick-start quad-play in the U.K., where only about 6% of total households currently purchase all four services from one provider, according to Strategy Analytics. The theory is that the discounts needed to win subscribers are then offset by the savings from lower customer churn. European operators have also turned to quad-play to win market share and benefit from the exponential growth in data usage.*"

See also BBC News, "*BT to buy mobile firm EE for £12.5bn*" (5 February 2015) quoting Dan Ridsdale, analyst at Edison Investment Research: "*In the space of a few months, the UK telecoms landscape has changed enormously. As the majors fill in the gaps in their offerings, competition to offer multi-play bundles is going to step up significantly.*"

¹¹⁵ For example, BT already retails at least 74% of all VULA connections, equating to a 36% share of all superfast broadband subscribers (see Ofcom, Fixed Access Market Reviews: Approach to VULA margin (March 2015), para. 3.55) In standard broadband, there are only a few competitors (in particular in more rural areas), as companies including TalkTalk and Virgin Media have withdrawn from the market; BT's acquisition of EE will be a 3-to-2 merger in many of these areas, increasing BT's pre-existing market power.

¹¹⁶ BT press release 17 June 2015: BT & EE Chief Executive say deal will create a UK digital champion: <http://www.btplc.com/News/#/pressreleases/bt-ee-chief-executive-say-deal-will-create-a-uk-digital-champion-1180519>.

consumer retail offering has included a £5 per month discount from its SIM-only deals for consumers who already are BT broadband subscribers.¹¹⁷

- 5.4 Vodafone itself has recently announced its intentions to move into the quad-play space by launching a home broadband offering this spring before adding a cloud-based TV service later in the year.¹¹⁸
- 5.5 In order to provide such bundles, an operator necessarily requires access to each of the constituent elements of the bundle. Following the acquisition of EE, BT will have the ability and an enhanced incentive to foreclose Vodafone and other providers from competing for quad-play packages by deteriorating the terms of access to its superfast broadband service which is an essential input to their quad-play offerings.

(C) Ability to foreclose Vodafone

- 5.6 In order to provide a quad-play package, Vodafone needs to source fixed voice and broadband services, as it does not provide these itself. Vodafone is reliant on BT as BT is the only operator in the UK to provide wholesale superfast broadband (the current product is Generic Ethernet Access or “**GEA**”¹¹⁹, which is a Virtual Unbundled Local Access (“**VULA**”) product) which is an essential element of any quad-play package. Virgin is not a viable alternative as it does not provide a wholesale product. BT’s provision of GEA as an input for quad-play packages is not subject to any regulated price control – it is instead subject to a “VULA Margin Condition”, which simply requires BT to preserve a sufficient margin between its retail prices for products that contain superfast broadband and the prices it charges its competitors for the GEA input.¹²⁰ Ofcom has stated that it would take account of mobile costs into its margin squeeze test; however the details of how Ofcom would take account of EE’s cost base are not clear, especially given BT’s ability to allocate costs to its own advantage.¹²¹ In the absence of an effective margin squeeze test, VULA pricing is not constrained.

¹¹⁷ See e.g. <http://home.bt.com/tech-gadgets/phones-tablets/bt-launches-the-uks-best-value-4g-mobile-plan-for-bt-broadband-customers-11363970677916>.

¹¹⁸ <http://www.ft.com/cms/s/0/6d7709cc-ab9a-11e4-8070-00144feab7de.html#axzz3UfOFB4C5>.

¹¹⁹ BT refers to its wholesale superfast broadband input as a “Generic Ethernet Access over Fibre to the Cabinet” (“**GEA-FTTC**”) product – see e.g. https://www.openreach.co.uk/org/home/products/superfastfibreach/fibretothecabinet/fttc/downloads/GEA_FTTC_2%2063350%20111108.pdf.

¹²⁰ When BT acquires EE, it will be able to spread its fixed costs that are “downstream” of the VULA superfast broadband input (such as the BT Sport fixed costs) over a larger subscriber base. This will reduce its per subscriber downstream costs, which would allow it, under the VULA Margin Condition to either lower its retail prices or increase the VULA wholesale price that Vodafone and other MNOs must pay without lowering its retail prices. In the latter scenario, BT/EE would again be raising rivals’ costs.

¹²¹ See further paragraph 2.61(iii).

(D) Incentive to foreclose Vodafone

- 5.7 BT will have enhanced incentives to foreclose Vodafone's access to essential wholesale inputs to superfast broadband as, once it has acquired EE, it will be able to offer an equivalent quad-play package to Vodafone and other MNOs independently (by combining EE's mobile offering with its own fixed voice, broadband and TV assets). BT/EE will therefore become a direct competitor to Vodafone in the provision of quad-play packages.
- 5.8 The Kenny report has recognised that consumers seek value for money with respect to their fixed and mobile services, which they often seek to achieve by purchasing (cheaper) bundled offers.¹²² However, as BT/EE will be active in the quad-play market, it will have the incentive as well as the ability to foreclose the access of other MNOs to inputs which are necessary for other MNOs to provide a quad-play offering, thereby weakening BT/EE's competitors. This will lead to a reduction in competition to the detriment of consumers, who will face higher prices.

(E) Conclusion

- 5.9 In light of what is happening in other countries, there is every likelihood that quad-play services will become an important aspect of competition in the UK in the future. Superfast broadband from BT is a crucial input to these services and therefore BT has the ability to foreclose downstream competitors in quad-play. The acquisition of EE will give BT enhanced incentives to engage in this sort of foreclosure strategy, in particular *vis-a-vis* other MNOs such as Vodafone. This will result in a SLC with respect to quad-play services.

6. POTENTIAL SPILLOVER CONCERNS IN RELATION TO DEUTSCHE TELEKOM

- 6.1 In addition to the serious concerns already raised, the CMA should also consider the possibility of spillover effects with respect to Deutsche Telekom, which will enter into a relationship agreement with BT governing its relationship as a shareholder in BT. Deutsche Telekom's CEO has recently stated that Deutsche Telekom "*will be the largest individual shareholder in BT and are laying the foundations for our two companies to be able to work together in future*"¹²³, as well as indicating that BT and Deutsche Telekom have "*so much to gain over time*", with the opportunity to "*create something big*"¹²⁴.
- 6.2 Deutsche Telekom and BT are competitors in many markets, especially in services to business customers and carrier services, both in the UK and throughout Europe. It is far from clear from the published documents and the statements of BT and Deutsche Telekom executives (such as those quoted above), how the two companies will "*work*

¹²² Kenny report, pages 1 and 10.

¹²³ Deutsche Telekom press release: <https://www.telekom.com/media/company/265230>.

¹²⁴ Deutsche Telekomwatch, Report #41, p.22.

together”, but it is reasonable to assume that it is likely to be in these markets where they already compete with each other.

- 6.3 The potential spillover effects arising from this relationship therefore also need to be examined closely by the CMA as part of its investigation of the BT/EE merger.

7. SUMMARY OF CONCLUSIONS

- 7.1 As set out in this submission, the proposed acquisition of EE by BT will result in a substantial lessening of competition in the supply of fibre backhaul services to MNOs, in the provision of retail and wholesale mobile voice and data services, and in the provision of triple-play and quad-play packages. The issues involved are complex and do not lend themselves to clear-cut remedies. Vodafone, in particular, will be concerned to ensure that, if remedies were to be offered by the parties, they fully address the concerns it has identified.