Vodafone Non Confidential Version

8 October 2015

Response to Ofcom's Consultation:
Strategic Review of Digital Communications discussion document

1. Executive Summary

The UK telecommunications market is worth over £37bn, delivers fixed broadband to 23m premises and currently has over 80m active connected mobile devices. Investment in 4G mobile networks continues at pace, with significant investments driving choice and innovation for the benefit of UK consumers and the whole economy. In the last year Vodafone alone has invested around £1bn in its networks and services, and extending its 4G coverage throughout the UK.

One can easily contrast the dynamic competition you observe in the mobile market with the current state of the fixed broadband market: Ofcom historically encouraged multiple operators to invest in fixed broadband creating sustainable competition between them based on that deep investment and control over the services each provided to their customers. Since the start of its Fibre to the Cabinet roll out, longer-term competition has been undermined by the regulatory freedom given to BT. This is concentrating the retail broadband market and limiting customer choice to the products designed and offered by Openreach.

Openreach runs a UK-wide access network offering almost ubiquitous coverage of both voice and broadband wholesale services. It is defined by two key characteristics: poor quality of service and high profitability:

- Openreach's own metrics show that in the first 6 months of 2015 it was late delivering nearly half of Vodafone's orders for the high bandwidth fibre upon which its mobile network and business customers depend;
- Independent research commissioned by Vodafone shows that in FY 2014/15 BT made nearly £800m over and above its expected returns across its regulated services, bringing total excess profits over the last 10 years to a staggering £6.5bn.

Such a situation was not envisaged when Openreach was established in 2005 and it demonstrates starkly that the current regulatory model no longer works.

Vodafone's own experience in other countries demonstrate that multi-operator investment in fibre networks can work. Today, Vodafone is:

- Rolling out or co-investing in ultrafast networks which already cover around 10 million premises in Spain and Portugal;
- Rolling out fibre to 500,000 homes in 50 towns and rural villages in Ireland via a wholesale-only structurally separate joint-venture; and
- Benefiting from improved responsiveness and service development as a customer of the structurally separated network business in New Zealand known as Chorus.

In addition to bringing customers a faster, future-proof service at lower prices than the UK these developments mean we can deliver a far superior service. For instance, in Spain and Portugal, where we deliver services over our own networks rather than via that of the incumbent we can get customers connected twice as quickly, we have 50% fewer service incidents and we can fix 87% of those incidents within 24 hours.

The advent of new fibre networks also means that the technology does not define the service a customer receives any more. Instead services such as pay TV can be provided over a variety of platforms whether satellite, cable, fixed or mobile broadband. As consumers are increasingly attracted to bundled offers of TV,

broadband, fixed and mobile voice services, the control of that exclusive content will increasingly steer their overall purchasing decisions. Therefore, exclusive 'must have' content is no longer just a TV issue, but impacts across the whole of the £43bn telecommunications and TV market.

Ofcom's Strategic Review of Digital Communications rightly covers all these issues and accordingly we call upon Ofcom to:

- Address discrimination and improve pro-competitive investment with the structural separation of BT.
- Put in place the framework for multi-operator investment by improving access to BT's ducts and poles ensuring BT must also use these products on the same basis as other providers.
- Act upon its concerns to ensure fair access to exclusive premium TV content and prevent market power in content from being used to dominate the adjacent markets of fixed access and mobile.

Vodafone does not believe that incremental tweaks to regulation can address these issues. It urges Ofcom to take bold structural steps to create a sustainable long-term market for the benefit of all UK consumers and businesses.

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2. Introduction

Ofcom presents a wide range of concerns in the Strategic Review of Digital Communications and organises them under four familiar headings:

1. Ofcom is concerned to promote private sector **investment** in the UK, particularly in fixed networks. Ofcom also recognises the role of public subsidy (or licence or similar obligations) when private sector investment is unable to deliver certain outcomes.

2. Ofcom is also concerned about sustainable **competition,** in terms of price but also (and perhaps more so) in terms of quality and innovation. It recognises that competition incentivises investment and that some forms of network competition also allow deregulation, so it regards competition as an important way to achieve some of its other goals. It is particularly concerned that Openreach retains the incentive and perhaps the ability to differentiate. Ofcom recognises that Openreach has delivered poor quality to its customers in the past, that the boundaries of what is regulated and what is competitive (i.e. the economic bottleneck) may be changing as we move from copper to fibre, and that regulating Openreach in its current form has proved more challenging (and perhaps less successful) than might have originally been anticipated or than it would wish.

3. Ofcom is concerned that consumers be **empowered** to realise the benefits of competition and ensure that it works robustly. It is particularly concerned that bundling may make switching more difficult.

4. Ofcom is also concerned to **target regulation** and deregulate where it can whether that is regulating further upstream or deregulating/loosening regulation in particular geographic sub-markets. In particular, it appears to recognise that trying to use detailed regulation to address the performance and management of Openreach - something it did not anticipate doing following the last review and the creation of Openreach - is unsatisfactory.

Vodafone agrees with this framework and these concerns. We also agree that Ofcom should continue to rely upon private sector investment to drive competition. State intervention should be limited to those geographic sub-markets where commercial investment is unviable.

This document sets out our understanding of current telecommcations markets, consumer choice and the investment climate. In particular

Section 3 looks at the impact of convergence on consumer markets

Section 4 looks at mobile services and reflects on the need to maintain viable network-based competition

Section 5 reflects on the current framrwork for regulating fixed access network markets and

Section 6 sets out Vodafone's views on an improved fixed network investment framework that would deliver choice and consumer empowerment.

3. Choice and Consumer Markets

Ofcom's principal duty, as set out in the Communications Act 2003, is to further the interests of consumers in relevant markets, where appropriate by promoting competition, and of citizens in relation to communications matters[1]

In an ideal market consumers are able to make rational decisions that maximise their self-interest and utility, whilst operators are equally able to make a return on investments, within a competitive environment through satisfying consumer demand. Ofcom's recent approach to consumer policy has been to focus on maximising consumers' access to information thereby allowing informed assessments of retail consumer offerings to be made and ultimately for consumers to be able to act upon their individual decisions. In a virtuous circle of *Access - Assessment - Action*, informed consumers make rational purchasing decisions to obtain the best deal and thereby drive providers to compete fiercely and make service improvements in order to acquire and retain customers.

However this is not where consumer markets are today. Instead, they are characterised by:

- Leveraging the control of exclusive content into access markets,
- Asymmetry of switching capability across bundled services and
- An increasing concentration of the retail fibre market;

Without action, concentration of the retail market driven by convergence some 10 years after retail SMP regulation was removed would be an unprecedented step backwards.

The following sections explore content, and switching in a converged market in more detail, recognising the changing market dynamics and the need for a concerted strategy to deal with those changes. Specifically, we call upon Ofcom to:

- Take action to address leverage of content into broadband access markets;
- Ensure that asymmetry of switching processes do not create bias in the market which leads to consumer harm;
- Review the applicability of General Conditions and consumer protection regulation in light of changing technology and market structures; and
- Review the application and impact of consumer protection regulation into supply side markets.

Since the last fundamental review in 2003, UK society has become increasingly dependent upon connectivity. There is a desire to strive for digital inclusion of all citizens; business systems requiring ubiquitous and continual connectivity and the insatiable desire to remain connected to social media is ever demanding. Increasingly, access to quality connectivity is viewed as an essential right are right rather than as an elective value added service. Industry has responded via IP based service competition, but the incumbent, BT has been able to secure a third[2] of the domestic broadband market, 60% of new adds of Openreach's high speed broadband and is further entrenching its market power through the bundling of Premium TV content.

[1] Part 1, Section 3 of the Communications Act 2003.
[2] table 4.44 http://stakeholders.ofcom.org.uk/binaries/research/cmr/cmr15/CMR_UK_2015.pdf

There is an increasing divergence between the service levels available and increasing consumer expectations. Openreach's poor performance has blighted the provision of service for all operators; customer service levels have failed to match consumer expectation and the consumer desire for continual ubiquitous coverage has not been matched by industry's ability to invest in or roll out the necessary infrastructure improvements nationwide, especially in rural areas.

At a regulatory level Ofcom has voiced concern about consumer propensity to act upon switching decisions even in light of the information provisions required of industry. In a model where the desire is for consumers to have Access to such information, to Assess and then Act the downward trend in switching that Ofcom reported in *The Consumer Experience 2014* suggests that either the majority of customers are perfectly happy with their supply; they do not have sufficient information to switch or there is no motivation to switch either through a lack of choice or switching capability. It is clear that consumers' switching habits are also being influenced by increased bundling of services, inclusion of content and access to OTT services.

In a converged market, the need for platform and technology neutral regulatory outcomes is more and more apparent as the underlying network or technology cannot be relied upon to define the service using it. The effects of bundling mean that the market will only perform as well as its weakest part, meaning a lack of competition or switching capability can impact more than a single market segment. In the following sections we look in more detail at the impact of content and convergence on the market, the ability for technology and platform neutral switching and asymmetric application of consumer protection regulation.

3.1 Content and Convergence: a re-monopolisation of the retail market?

As network convergence becomes a reality, TV and video content is now provided not just over satellite or cable systems, but over a standard broadband connection. Audio visual content has driven the take up of 4G mobile services: convergence may soon be the norm. Triple play and quad play consumer packages mean that the capacity of 'key content' to act as a significant driver of consumer choice influences not just the choice of Pay TV provider but the telecommunications services provider as a whole.

Key content is by its nature exclusive, or put simply a monopoly input, which in any other scenario would be subject to appropriate regulation. Ofcom acknowledges that consumers value a wide range of content genres; however Vodafone agrees with the findings of the *2014 WMO Consultation*, that sport stands apart due to its very specific characteristics: propensity to lose value after live broadcast; its degree of exclusivity to individual pay TV services and the sums invested to secure those relevant exclusive broadcast rights. In particular, Sky and BT's willingness to spend so much on sports broadcast rights (most notably for Premier League and Champions League content[3]), than on other genres indicates the value they believe they can recover from utilising this content. Given the combination of these factors, sport appears to be uniquely placed to drive consumer choice in Pay TV services and beyond.

However, this raises the concern that given the rise in converged services, content providers will be incentivised to leverage their rights of such 'key content' and limit distribution, in order to protect market share in adjacent markets. Ofcom has for years been grappling with this issue of dominance in the TV market, however the effects are no longer isolated to TV or even Pay TV. Ignoring the effects of 'key content' across wider and traditionally unrelated markets, such as mobile or broadband only customers, will have an

[3] Whilst the 2014 WMO consultation rightly acknowledges that 69% of respondents considered two or more individual sports or competitions as 'essential', football was by far the most common sport to be described as 'essential' without reference to another sport. Moreover, Figure 5.3 of the consultation reveals that for both BT Sport and Sky Sport customers, live Premier League content was the most commonly cited single football event, in response to what was the main reason for them taking BT Sport and Sky Sport

enduring and irreversible effect, as the focus moves to TV bundled competition. [✂] Vodafone ultimately remains concerned that if access to this content cannot be secured on Fair, Reasonable and Non Discriminatory terms, competition and consumer choice across a variety of telecommunications markets will be severely harmed.

Vodafone sees this trend materialising in other jurisdictions such as Spain, where Telefonica, the dominant provider of Pay TV is also the sole recipient of rights won in recent auctions for all the games of the top two leagues in Spanish football (in addition to rights to other exclusive content). This is the first time the rights have been collectively sold, rather than leaving it to individual teams to sell their own rights. Whilst Telefonica has to provide some access to other Pay TV providers, it is expected that this collective sale will have a detrimental effect on the triple play and quad play market in Spain.

In 2013, Analysys Mason[4] predicted that in 2017 nearly half of all UK broadband subscribers will be buying a triple play package. This trend may indicate the good deal that consumers are getting from bundled package in the short term, however when a driver of consumer choice, key content, is left largely unchecked, it can easily translate into a re-monopolisation of network services. Historically this was due to voice, but now 30 years after liberalisation of the telecommunications market, it may be due to TV.

Customers who actively seek out a bundled deal, or are early adopters of new technology or services could easily become locked into their provider due to lack of choice in one or two parts of the bundle.

Ofcom could address the leverage of monopoly content into network access markets in three ways:

Limit the ability of premium content holders to offer bundled retailed services

This type of control appears has a simple appeal – limit the leverage of content into a bundle in order to not cause a problem. This type of regulation, whilst simple to design is likely to be difficult to monitor and administer: defining the bundle, allowing consumers to legitimately exercise choice and restricting market developments would all be of concern. It would be better to address the problem upstream and allow a retail market to develop more naturally.

Require rights holders to provide wholesale access to the content.

This approach is partially implemented at the moment by Ofcom through the use of Wholesale Must Offer framework. However the WMO does not automatically apply to all parties in the market: it does not take account that key content is now owned by two parties; however both have monopoly rights to their share of that content and therefore can maintain a stand-off in the wholesale market. And there is a fundamental lack of recognition that pay-TV is a market which is being used to leverage into traditional telecommunications markets and as a result, has wider implications that just pay-TV customers. Regulatory policy backing to support Wholesale Must Offer regime is necessary to ensure its effective application.

Address it at source by structuring content rights auctions to reduce the impact of exclusive content

Fundamentally, leverage from content into network access markets occurs because content is offered on an exclusive basis. There are many ways to improve the structure of audio-visual rights auctions such that it minimises the scope and extent of exclusive content. One method would be to create incentives for rights holders to trade such content by structuring the content packages in a way such that the rights were held

[4] http://stakeholders.ofcom.org.uk/binaries/consultations/fixed-access-market-reviews/responses/BT_-_Analysys_Mason_report.pdf

more broadly and no single party had a majority of the content. This would provide the incentives for rights holders to provide the content more broadly by trading it. Another method would be to auction the rights in a manner where there was less exclusive content, and therefore individual packages won by different parties would include many overlapping games. In the retail market it would be possible to compete based on a subset of the total content rights as key games would be offered across the board

As we have touched upon there are various ways of addressing the fundamental problem of exclusive content. We are very aware of Ofcom's open Competition Act investigation into FAPL rights auctions. However in the absence of fundamental market change whilst the investigation is ongoing, modifying and fully implementing effective WMO remedies is urgently required. Without effective WMO obligations upon all rights holders of 'key content', such content will function as a barrier to entry to a high value market segment, rendering it almost impossible for other providers to effectively compete for consumers that value key sports content. This would then produce the exclusionary and discriminatory outcomes that the WMO was originally designed to mitigate against. Furthermore, as Ofcom's 2014 Infrastructure report notes, the increase in quad-play and triple-play propositions creates further opportunities for rights holders of key content to leverage this asset into other markets, most notably consumer broadband. An insistence on reciprocal supply of channels containing key sports content would then likely amount to a practice that is prejudicial to fair and effective competition, in circumstances where the holders of key sports content, effectively refuse to do wholesale deals with Pay TV retailers with no such content. In a converged world, this may be done either to protect their incumbent position in fixed or in pay TV.

The ability for leverage from content into other markets is starkly demonstrated by the complexity of the margin squeeze test that Ofcom has put in place to regulate the price of Openreach's VULA products. It is standard regulatory practice to price regulate Openreach's SMP products based on costs, either with a cost orientation obligation or with charge controls. In the 2014 WLA Market Review Ofcom chose not to price regulate Openreach's VULA product but to put in place a margin squeeze test that would assess whether Openreach's prices for VULA allowed an independent CP to compete with BT's own retail business. Historically this test would take account of broadband, and perhaps broadband + voice bundled products and prices. Voice, broadband and pay TV markets are now so intertwined that in order to assess Openreach's compliance with its regulatory obligations, Ofcom needs to unpick the costs, margins and take up associated with BTRetail's content deals. This approach to ex ante regulation provides no certainty to CPs, no clarity about forward looking prices from Openreach and allows BTRetail to shape the entire broadband market through its sales volumes and prices in order to manage its costs and therefore its margins. BTRetail is not merely a player in the market, it is the market maker through its leverage of content. Furthermore the fact that this remedy cuts across the functional separation of Openreach and BTRetail shows that Ofcom can no longer rely upon Functional Separation to maintain arms length between Openreach and its downstream internal customers.

3.2 Switching and Convergence: technology neutral switching must become a reality

The way consumers switch providers today varies: some switching processes have been designed ad-hoc by businesses or by the market sector to which such processes apply; others have been designed by Ofcom upon a full review from the existing policies and processes. The co-existence of different processes, even for changing provider for the same services, significantly affects consumers' switching experience. Sometimes, the complexity of switching processes in the telecoms market has deterred customers from transferring one or a bundle of services to a new provider.

If consumers cannot switch between providers easily, they may incur unnecessary switching costs deriving from the lack of clarity and predictability of multiple processes, inconvenience and distress. Vodafone also

believes that the effects of multiple switching processes on competition can harm consumers even further: consumers who incurred some detriment in transferring their services from the old to the new provider may be deterred from switching providers in the future. On a wider scale, if switching is difficult, consumers may not be able to fully benefit from the advantages that changing provider in a competitive market offers. Furthermore, the co-existence of a number of switching processes for the same service may increase the difficulties experienced by some providers in winning churning customers back, whilst it may make it easier for other providers to gain more customers. This can result in a lack of competitive neutrality between operators, caused by underlying differences in the switching processes adopted to transfer the same services.

Currently switching policy is not technology neutral in its approach or its implementation and as a result, switching from cable or satellite to fixed access based services are harder to achieve and therefore likely to impact customers' willingness and ability to switch. The two examples below set out some of the problems:

Switching from Cable to Fixed: In the fixed line market the transfer of fixed voice and broadband services provided over the Openreach and KCOM network follows a Gaining Provider Led switching process, whilst switches from the Virgin Media network (which has a market share of 20%[5]) follow a Cease and Re-provide process. Under the Cease and Re-provide process, churning customers are required to contact Virgin Media to terminate their service before starting a new contract with the Gaining Provider this allows the Losing Provider, Virgin Media, to make a Reactive Save offer to convince the customer to stay by offering a more convenient deal.

Switching from Satellite to Fixed: Customers who want to transfer their fixed line and Pay TV services from a fixed broadband provider to Sky need to follow a Gaining Provider Led process[6]; by contrast, Sky customers who want to transfer their Pay TV and fixed line bundle to a fixed broadband based provider need to follow a Losing Provider Led switching process[7] and, therefore, refer to Sky. Increasing the number of steps that consumers must take in order to transfer their services to a new provider may increase the complexities and difficulties faced by consumers accordingly. The process also creates a save opportunity for Sky.

The lack of platform neutrality for the provision of a service should be seen in the wider context of the telecommunications market, particularly with regards to the increasing trend towards bundling. Without any strategic oversight and regulatory intervention, there is a strong risk of consumers harm when switching provider in a market where the boundaries between services are becoming increasingly unclear. The co-existence of multiple processes for transferring a bundle of services to a new provider may require consumers to navigate different switching processes, which can result in a poor customer's experience.

Whilst we recognise that detailed processes behind the customer experience will differ across platforms and providers, this should not deter Ofcom from putting in place equitable and transparent processes across industry. Implementing a harmonised process to transfer bundled services between providers through simple and clear procedures would improve customers' switching experience in terms of consistency, clarity and ease of switching and ensure no structural distortions of the market.

[5] Ofcom 2015 Facts and Figures, Market shares of fixed broadband providers in the UK, http://media.ofcom.org.uk/facts/

[6] http://www.sky.com/shop/switching-to-sky/broadband

[7] http://help.sky.com/articles/remove-a-package-or-cancel-your-subscription

3.3 Asymmetric Consumer Regulation and Unregulated Monopolies

In 2003 regulation still considered traditional Publicly Available Telephony Services (PATS) to be distinct from services offered without network ownership: Public Electronic Communications Services (PECS). As such much regulation was placed upon providers of voice (PATS), rather than PECS and online services. As the market has developed, Over The Top (OTT) providers in increasing numbers have established services that are accessible over the internet and via traditional networks but which remain essentially independent of the network infrastructure provider. This not only challenges the business model of the network infrastructure operators, but also the regulatory regime. OTT services continue to be regarded as "Information Society Services". These typically remain outside the scope of regulation as the services themselves do not include conveyance of electronic signals leading to a distinct dichotomy between the regulatory framework applying to PECS and that enjoyed by OTT services.

A review of the current provisions to introduce an appropriate technology-neutral and future proof regime creating consistent regulation across all market participants is overdue. Experience shows us that regulation has been created incrementally, essentially added to through disparate, organic amendments without a holistic structure. Continuation of what is already a complex and labyrinthine compliance regime will not achieve clear consumer protection but rather promulgate asymmetric regulatory approaches.

Many services will be provided OTT-only in the future, and yet little thought has been given to how and if these services should be regulated in order to provide the right level of consumer regulation in an environment where they become the primary service. This strategic review needs to evaluate the scope and opportunity to modernise consumer safeguard provisions.

In addition, it is becoming apparent that consumer protection regulation is creating opportunities for monopoly wholesale supply: for instance the obligation to provide Next Generation Text Relay and Emergency Calls means that the monopoly provider has a captive market. Ofcom has addressed similar issues in the past through the change and liberalisation of the Directory Enquiry Market. We do not believe that approach is the right one in this context, however recognising the monopoly extent of the problem certainty needs addressing. These two examples are set out in more detail below:

The provision of Next Generation Text Relay (NGTR) is a prime example of the dangers of allowing BT to engineer a monopoly position for crucial consumer services of clear social value. Ofcom chose not to set regulation to intervene in the implementation of NGTR and allowed BT to define both the implementation of NGTR and set its charges to its wholesale customers. In doing so, BT leveraged its existing commercial relationships with operators prior to the launch of the new service, locking CPs into it with BT the sole supplier in the market. Whilst this could have resulted in some innovative development, this appears not to have materialised.

NGTR is undeniably a better proposition than the original text relay service, but it is a clunky app whose technical solution is firmly rooted in the previous dated technology rather than being a true "next generation" solution. The Google Play Store reports only 1000 downloads and comments since launch describe the app as a "step in the right direction" but also "clunky, dated and needs upgrading". It is indeed a step in the right direction, but only from the low bar that was originally set and yet due to the contractual lock in, restricts the opportunity for alternative market entry.

A similar position exists in relation to the Emergency Services where following the market exit of Cable &Wireless Worldwide, BT remains the only credible supplier of Emergency Services Call Handling. BT has taken advantage of this monopoly position by raising the cost of handling PSTN calls from 65.71ppc to 80ppc in May 2015 and is able to set its own price for call handling in other regulated markets, such as eCall

where prices for handling Global Positioning Emergency Service (Telematics Service) have rocketed from 250ppc to 1000ppc ahead of European regulation in April 2018.

A review of the applicability of consumer protection regulation should also take account of the markets created as a result of that regulation. Whilst appropriate costs should be rightly borne, inappropriate pricing should be avoided, as this distorts the market further.

4. Mobile Networks and Services

As Ofcom correctly notes, mobile has been and continues to be a great success, delivering very significant benefits to consumers, through successive waves of investment and innovation coupled with competitive pricing (the price of a typical bundle of mobile services has fallen by two thirds between 2003 and 2012).[8] Network competition with multiple access networks has been a feature of the mobile market from the very outset. This is in marked contrast to fixed where the legacy of BT's monopoly incumbency is still being felt to this day. The very different starting point goes a long way towards explaining the wider contrast in outcomes.

Whereas fixed relies on an 'access based' model of regulation based on BT's upstream control of an enduring bottleneck, mobile relies instead on what Ofcom describes as 'end-to-end' competition between networks which is self-sustaining without regulatory intervention to impose a secondary 'access' layer of competition.[9] We think the undoubted success of this model of mobile competition in terms of consumer outcomes speaks for itself.

As Ofcom notes:

> *"UK consumers have benefited greatly from end to end competition in mobile services, and we believe that where effective end to end competition is sustainable, it should be maintained. A model of competition based on regulated access may not be able to deliver the same level of benefits. We should be cautious of adopting such an approach, other than in circumstances where end to end competition is not sustainable."*[10]

We strongly agree that network competition between MNOs rather than access based competition should remain the preferred model. It has successfully delivered both retail and wholesale competition between MNOs on flexible commercial terms to the ultimate benefit of consumers. The existence of a variety of MVNOs ranging from niche players to household name brands and CPs entering mobile from adjacent markets is a symptom of vibrant network competition.[11] However, while we believe network competition is the right model, it is also important to recognise the extent to which the challenges ahead differ from those of the past and the implications this may have for policy. In particular, the public policy issue for mobile is not simply how to sustain sufficient competitive tension between networks to maintain downward pressure on prices but also how to manage the supply (and hence costs) of critical inputs that are, in the main, outside the direct control of MNOs.

Ofcom notes that all operators are investing heavily to roll out 4G coverage and appears unconcerned about future investment and innovation, assuming that network competition will continue to drive investment in a virtuous circle. Vodafone agrees that competition can drive investment. However, beyond the current wave of investment in 4G coverage, very substantial continued investment will be required to meet future capacity challenges and such investment will only be viable if investors have confidence that it will yield returns above the cost of capital.

We reject Ofcom's assertion that MNOs are generally making returns above their cost of capital. **[✂]**

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[8] See consultation document at 9.76 and onwards

[9] While the essential contrast between access-based and network-based competition is important, 'end to end' may be a slight misnomer insofar as it obscures the importance of upstream access to fixed network infrastructure for mobile backhaul.

[10] See consultation document at 9.90

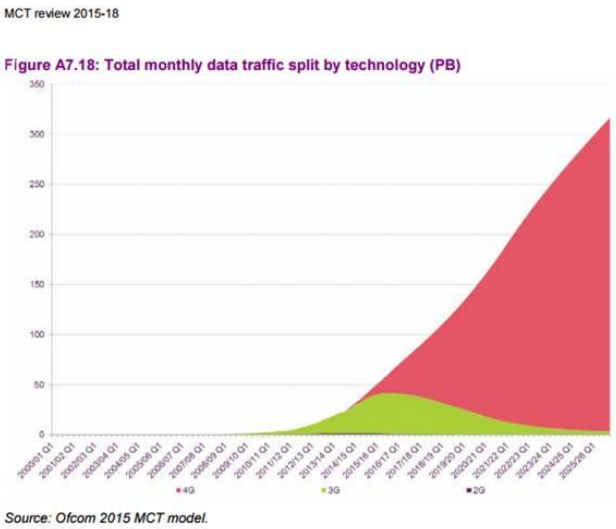
[11] As discussed further below, competitive intensity is about more than simply the number of competitors

Ofcom's approach seems to ignore the importance of actual returns on past investment as a guide to future investment risk. More recent statements by Ofcom focusing on cashflow margin also fail to reflect profitability on cumulative investment over time.[12] Cashflow margin it is not a measure that Ofcom uses in its charge control regulation to allow a fair return. Its regulatory policy is to allow dominant operators e.g. BT to make a return on all their relevant investments, not simply a current year comparison.

Below we consider the capacity challenge facing all MNOs and then turn to consider three critical inputs in turn: spectrum; sites and backhaul, before turning to network sharing and finally consider some of the policy choices facing Ofcom in relation to network competition and entry assistance.

4.1 Future capacity challenges

The UK is on the cusp of massive projected mobile data growth which, although already dramatic, is only just beginning.[13]



Source: Ofcom 2015 MCT model.

While precise estimates vary, most commentators expect very substantial growth in demand for mobile data, unlocked by the transition from 3G to 4G. It is, of course, very early days for 4G. In the first phase, coverage is still being rolled out. But against a background of huge projected increases in demand this will need to be followed by roll-out of additional capacity. In fact, capacity upgrades are already taking place to alleviate congestion in areas where 4G is already established as usage takes off.

Already, and increasingly in the future, 4G coverage is not simply a question of 4G signal vs no 4G signal, but the quality of coverage, driving capacity needs in areas of high traffic concentration. Speed and capacity are to a large extent two sides of the same coin. Additional capacity supports higher speeds for any given level of simultaneous demand.

The phenomenal take up and growth of 4G traffic volumes presents a markedly different situation compared to that which faced the mobile industry and mobile users at the dawn of the 3G era. UMTS was a compromise technology devised to handle both voice and data but not optimised for either. Critical parts of

[12] http://media.ofcom.org.uk/speeches/2015/consumers_and_consolidation/
[13] http://stakeholders.ofcom.org.uk/binaries/consultations/mobile-call-termination-14/statement/Annexes_7-13_final.pdf

the ecosystem needed to support an attractive customer proposition were not well developed at the time of 3G service launch. The 'smartphone' and associated application revolution are relatively recent innovations post-dating 3G service launch by some years. It was not until 2008 that the first 3G iPhone emerged, and somewhat later before subsequent innovations and the familiar smartphone form factor now produced by a range of manufacturers, became commonplace.

4G launch has taken place against a very different background where the pre-existence of smartphones and associated apps, plus widespread availability of Wi-Fi broadband connectivity in the home, have helped to preview the capability of a truly mobile broadband internet experience which 4G is now unlocking. There is clearly a perfect storm that has already begun a fundamental step-change in the demand for mobile data.

With this, there can be no doubt that 4G has the potential to bring about huge economic and social benefits. As Ofcom noted in its strategic spectrum review:

> *"Mobile broadband and the services and applications it sustains deliver significant benefits to UK citizens and consumers today. Mobile services already deliver significant economic value, and mobile broadband growth could increase this further, sustaining further innovation and making an expanding range of new high value mobile services available to consumers. Sustaining mobile broadband growth, including the delivery of high-capacity services to rural areas, could also make a significant contribution to citizen benefits, contributing to digital inclusion and facilitating social participation. For these reasons we believe that considering the most appropriate enabling action to address the growing demand for mobile data could deliver significant future benefits to UK consumers and citizens in the future."*

Indeed, following the 4G auction of spectrum at 800MHz and 2.6GHz, Ofcom estimated that the value that 4G services could provide to consumers over the following 10 years could be in excess of £20bn.[14]

We agree. However, realising these benefits depends on continued investment which requires an economic return. It is therefore vital to address all the input bottlenecks with potential to drive cost so that the benefits investment can unlock are not choked off prematurely.

4.2 Spectrum

Spectrum is critically important to mobile networks. It provides the 'last mile' connectivity between radio base stations and mobile handsets in much the same way that copper or fibre links provider the 'last mile' in fixed access networks. However, spectrum is not only a scarce resource, it is also contended in usage i.e. the bandwidth that any spectrum provides in any particular cell is shared among the users of the network in the area covered by the cell.

In the past, considerable importance has been attached to the different propagation characteristics of low versus high frequencies. Lower frequency spectrum has an advantage for wide area coverage and deep in-building coverage. However, higher frequencies can be extremely useful for adding additional capacity on top of the basic coverage layer and recent evidence suggests the relative value of higher and lower frequency is narrowing. This is partly because with a coverage layer already in place, 'reach' is less of an issue than when building basic coverage, partly because there is more availability of spectrum at high frequencies, and partly because large individual channel widths (e.g. 20 MHz for LTE) are important to maximise the efficiency of spectrum usage and support high data rates.

[14] http://stakeholders.ofcom.org.uk/binaries/consultations/spectrum-management-strategy/summary/spectrum_management_strategy.pdf

Carrier size and the overall quantity of spectrum deployed are what matters when it comes to speed or capacity, which are essentially two sides of the same coin. This does not mean that frequency differences are unimportant. They are very important when it comes to differences in ecosystem development and how 4G ready particular spectrum bands are, but increasingly the idea that there is a sharp demarcation between low frequency spectrum below 1GHz and high frequency spectrum above 1GHz is misconceived. This is clearly shown, for example in relation to the results of the recent German spectrum auction, which revealed that 1800MHz spectrum is currently more valuable than 900MHz spectrum.[15][16]

Over the long term, some of these differences may become less acute. Similarly, the differences between paired FDD spectrum and unpaired TDD spectrum may alter as the ecosystem needed to support more widespread TDD usage develops. But competition plays out over the short and medium terms as well as the long term and it would be quite wrong to think that significant holdings of currently 4G ready spectrum do not confer significant advantage today and for the foreseeable future. We return to these themes and their implications for policy in the final section below.

4.3 Mast Sites

Access to appropriate sites for mobile base stations is the second critical element needed to support mobile coverage and capacity expansion. Much of the recent focus, for example in the context of reforms to the Electronic Communications Code (ECC) has been on network coverage – extension of coverage to areas not currently served and the elimination of local coverage blackspots.

The need to contain costs is perhaps most obvious here in view of the fact that lightly used sites in rural areas will often be uneconomic on a stand-alone basis. While rents for rural sites tend to be lower than for urban sites, capital costs tend to be higher, driven by backhaul and the need for power supplies. At the same time, lower population density in rural areas means that revenue attributable to traffic from rural sites often fails to cover operating costs. Deloitte estimate that nearly half of all mobile sites across the UK are unprofitable.[17]

Reform of the ECC remains vital to ensuring improvements in rural coverage. The coverage targets recently incorporated into MNO licences are predicated on delivery by Government of the necessary reforms. However, it is not just coverage extension and infill of localised 'not spots' to which ECC reform is relevant. Against the background of projected dramatic growth in demand for mobile data and consequent need for additional network capacity, site access is a critical factor in relation to network 'densification' in capacity constrained areas.

Site access affects capacity expansion in a number of ways:

- Provision of new sites – adding additional capacity via 'cell splitting' or deployment of small cells within an existing macro coverage footprint both involve the need to commission additional sites;

[15] See Ofcom's recent statement on Annual Licence Fees for further discussion at http://stakeholders.ofcom.org.uk/binaries/consultations/annual-licence-fees-further-consultation/statement/statement.pdf
[16] For more extensive discussion, see Vodafone's response to Ofcom's supplementary consultation on ALF, particularly Annex 2: http://stakeholders.ofcom.org.uk/binaries/consultations/annual-licence-fees-further-consultation/responses/Vodafone.pdf
[17] Deloitte: *'Economic impact of the proposed Electronic Communications Code reforms: A report for the Mobile Operators Association',* 26 February 2015

- Upgrade of existing sites – is also dependent on site access. This includes not only physical access to the sites in question to perform engineering upgrade work, but also the commercial terms on which upgrades take place.
- Changing site use – network sharing is an important part of cost minimisation but can be frustrated by commercial restrictions and ransom rent demands from landlords.

These various aspects of site access are in practice interlinked and mutually reinforcing. For example, the planning restrictions that help confer local monopoly power on site landlords enabling them (or their agents) to extract ransom rents contribute to delays in providing site access. In Vodafone's experience, the actual time taken to build a new site once planning, wayleaves and commercial agreement have been achieved may be measured in weeks. However, the overall lead time may be measured in months or even years: 12-18 months might be a reasonable rule of thumb for the total length of time it takes to obtain a new site and get it up and running.

As noted above, appropriate reforms to the ECC are clearly needed to enable MNOs to fulfil the new coverage obligations. But their importance extends much wider than that. Site access bears directly on feasibility, cost, timeliness and cost-effectiveness of network densification. Competition between MNOs means each MNO is strongly incentivised to minimise costs to the extent they can, but does little on its own to limit the ability of site owners to restrict supply – an ability to which planning and other public policy restrictions actively contribute. Landlords' ability to withhold consent is a key bargaining chip used to extract money from MNOs, whether via rent increases or one-off payments. However, the effect is not confined to the particular sites in question. If MNOs accede to landlord demands for increased payments, the resulting higher rents become the new commercial benchmark, resulting in an inflationary spiral in rents.[18]

Vodafone appreciates that the policy choices in question go beyond those which fall within Ofcom's own direct area of responsibility. Nevertheless, it is important that Ofcom engages with other parts of government to ensure that the linkages and tensions between competing public policy objectives (e.g. maximise coverage, minimise cost, maximise digital inclusion, minimise visual intrusion) are properly understood so that the correct balance can be struck. The delivery of reliable, high speed mobile connectivity across the UK ought to be a singular objective around which all can unite.

4.4 Backhaul

Mobile backhaul is the third key link in the chain, and takes on increasing significance against the background of sharply rising capacity requirements. Whether MNOs seek to increase capacity by deploying additional spectrum at existing sites or by adding more sites through cell splitting or small cell deployment, the sites in question require backhaul connectivity into the MNOs' core networks. Increasing capacity in the radio access network needs to be accompanied by increased backhaul capacity; otherwise backhaul becomes the new pinch point.

In the past, when backhaul was principally required to support voice with only a limited amount of data, a variety of backhaul technologies could be employed including copper and microwave as well as fibre. However, increasingly fibre based backhaul is the only realistic option, with microwave confined to particular installations which have a clear line of sight and for which fibre is not cost-effective.

[18] See MOA response to ECC consultation, April 2015, Annex 2 for further detail and examples of ransom rent demands

In practice, dependence on fibre currently means dependence on BT as virtually the only provider of fibre based mobile backhaul for much of the UK.

It is not just the cost of mobile backhaul that matters but also quality, for example in relation to timeliness of service delivery and repair. Delays in service delivery act as a drag on 4G network roll out. This is unsatisfactory, and we expect is likely to have effected all MNOs in similar fashion, with BT having the ability but no strong incentive to prefer one MNO over another. All that could change, however, were BT's proposed acquisition of EE to proceed unless effective measures are put in place to prevent such abuse.[19]

Vodafone has very serious reservations about the proposed BTEE transaction, not least in relation to mobile backhaul where BT's clear incentive and ability to foreclose downstream mobile competition by acting strategically to degrade backhaul provision to its mobile competitors must be addressed.

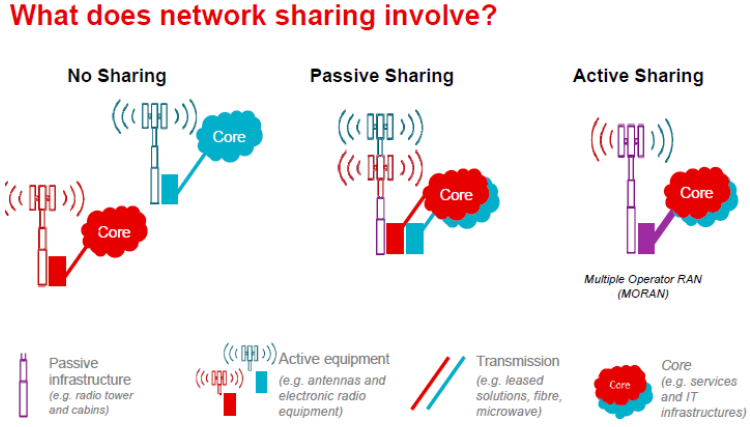
Vodafone notes Ofcom's proposals in the BCMR for a dark fibre remedy without service restrictions which could potentially facilitate self-provision and wholesale competition in the supply of mobile backhaul. This is a step in the right direction, although to be effective in addressing the competitive distortion and providing a cost-effective alternative to BT's active product set, the level at which prices are set and the need for dual fibre connections will need to be addressed.[20]

4.5 Network sharing

As Ofcom notes[21] network sharing also has an important role to play in keeping costs down and enabling MNOs to deliver network improvements cost-effectively.

Each of the four UK MNOs are currently party to network sharing arrangements. Network sharing has significant procompetitive benefits. It delivers substantial efficiencies in opex (rents/rates, transmission/backhaul and maintenance) and capex (site build and equipment installation). It facilitates wider and deeper network coverage (including in rural areas) in shorter timeframes. And it can help offset spectrum disadvantage. However, network sharing must be balanced. It is important for competition that smaller rivals are not marginalised.

There are a variety of different forms network sharing can take (see below).



[19] Vodafone notes that prior to the proposed merger, EE was among BT's most vocal critics.
[20] See Vodafone's response to Ofcom's Business Connectively Market review for further details http://stakeholders.ofcom.org.uk/binaries/consultations/bcmr-2015/responses/Vodafone.pdf
[21] See SRDC consultation document at 4.27

In the UK there are currently two network sharing partnerships, MBNL (EE and 3) and CTIL (Vodafone and O2). The two network sharing arrangements differ in detail, but both involve sharing sites and backhaul costs among other things. On the other hand, neither network share involves sharing spectrum. So while site sharing between network sharing partners may increase coverage overlap, other dimensions of network differentiation are preserved. Currently, each network share has two competing networks sharing some shared assets and external costs such as backhaul.

The prospect of consolidation in the form of BT's proposed acquisition of EE and H3G's proposed acquisition of O2 raises questions about the future of network sharing in the UK. In order to maintain effective network competition, it is vital to ensure that the efficiency benefits of network sharing are not denied to any operator who relies on them to be an effective competitor.

4.6 Policy choices and trade-offs

We note Ofcom's preference for more rather than fewer competitors, all else equal, and also its policy preference for what it terms a minimum of four 'credible national wholesalers'[22], although the European Competition Commissioner has recently clarified that four is not necessarily a 'magic number', that international comparisons do not show a clear link between number of competitors and competitive intensity, and that other factors can be important.[23]

It is worth recalling the origins of Ofcom's four national wholesalers policy as articulated at the time of the combined auction of 800MHz and 2.6GHz spectrum. Ofcom's stated aim was to make sure that the auction did not of itself precipitate a reduction in the number of competitors. To that end, Ofcom sought to balance a number of different considerations. On one hand, it did not specifically demand an outcome that resulted in exactly symmetrical spectrum holdings between competitors. On the other, it also wished to avoid extreme imbalances in spectrum holdings with particular emphasis on minimum holdings for the competitor with least spectrum to remain 'credible' as a national wholesaler i.e. having a realistic prospect of competing across the market to gain market share.

Essentially, Ofcom's previous position was that slight asymmetry in spectrum holdings might be no bad thing if a relative lack of spectrum were compensated by corresponding advantages elsewhere. In the present consultation, Ofcom continues to defend asymmetry, stating:

> *"Effective end-to-end competition relies on vigorous competition between a number of credible national wholesalers. To date, our policy has been to use access to spectrum to facilitate this. However, wholesalers do not need exactly the same spectrum holdings to be credible competitors. Indeed, we see benefits to having some asymmetry of spectrum holdings (which can facilitate different business models) as long as downstream competition is maintained."*[24]

However, present imbalances in spectrum holdings are not slight. EE has roughly three times as much spectrum as H3G, and around six times the critical 4G ready spectrum needed to accommodate rising data demand. If BT and EE's current spectrum holdings were combined, they would possess around three times the 4G ready spectrum of their nearest rival, even if H3G and O2's holdings were combined. These relative deficits are of the same order that previously gave Ofcom concern as to whether a national wholesaler could remain 'credible'. Moreover, the deficits are not offset by corresponding advantages among BT/EE's

[22] See e.g. consultation document at 9.76
[23] See summary of Ofcom's evidence to CMA on BTEE 5 August 2015
[24] See consultation document at 9.79

competitors. In other contexts, Ofcom has sought to suggest that there is no long term problem because more spectrum will become available and because there are other ways to increase capacity without additional spectrum.[25] However, neither proposition can be accepted uncritically.

Adding capacity without additional spectrum

In principle, given enough time and money, coupled with ECC and planning reform, it is true that there are various ways in which MNOs could seek to augment capacity that do not involve deployment of additional new spectrum. However, it does not follow that Ofcom should be unconcerned about extreme spectrum imbalances on the grounds that 'there are things you can do without additional spectrum'. The issue is not simply whether there exist any potential options to add capacity that do not rely on additional spectrum but the relative cost effectiveness of such options compared to deploying additional spectrum at the macro layer.

For proposed 'solutions' that involve additional sites, the cost and timescales involved have already been noted above. To provide any sort of substitute for additional spectrum would require the commissioning of incremental new sites relative to a level of new site addition in the counterfactual. Site scarcity, planning constraints, ransom rents plus the need to provision new backhaul links mean that solutions of this kind are simply not comparable with deployment of additional 4G ready spectrum at sites with backhaul links already in place.

This is particularly relevant to small cells where there are multiple hurdles to overcome. Small cells such as Vodafone's Rural Open Sure Signal can provide very effective niche *coverage* solutions in certain circumstances, but that does not mean they provide a cost-effective alternative to spectrum deployment at existing macro sites when it comes to providing incremental *capacity* within the macro cell footprint. Small cells can have a role to play in alleviating capacity constraints when it comes to clearly identifiable localised traffic 'hot spots'. But where demand is not so concentrated, or the location of demand is not predictable or stable over time, small cells are less able to contribute to overall capacity within a macro cell footprint than additional spectrum at the macro level.

As regards refarming, there are several issues to consider. First, the feasibility of refarming is constrained by existing usage. Second, the ease with which refarming can be accomplished depends on the bandwidth available. Third, the benefit of refarming depends on the level of ecosystem readiness for the particular frequencies in question. These factors combine to make refarming spectrum for 4G usage considerably easier for some MNOs than for others.

Future spectrum availability

Ofcom also points to future spectrum releases to suggest current asymmetry in spectrum holdings should not be of concern since more spectrum will become available in the foreseeable future. The next planned release is the PSSR 2.3GHz and 3.4GHz spectrum which Ofcom plans to auction next year. However, while the auction of this spectrum may be imminent and will provide spectrum certainty to the successful bidders for network planning and design purposes, the timescale for these bands to make any significant contribution to alleviating capacity shortfalls is considerably more distant and will take time for the mobile network and terminal ecosystem to support the frequency bands.

[25] See e.g. Ofcom submission to CMA on BTEE

Vodafone and H3G have recently obtained 20MHz each of so-called L-band spectrum in the 1.4GHz band through private sale, now approved by Ofcom. In its decision to authorise the sale, Ofcom correctly noted that there could be no competition concern arising from Vodafone's acquisition of this supplemental downlink spectrum in view of the far greater spectrum holding of EE.[26] This conclusion holds irrespective of whether 1.4GHz spectrum is regarded as 'high' or 'low' frequency spectrum. However, opportunities to obtain spectrum suitable for mobile use via private sale are few and far between, making auctions under Ofcom's auspices the main vehicle by which MNOs may obtain additional spectrum to meet ever increasing demands for data capacity.

This raises the question of auction design. In the past, policy makers deliberately sought to use the 3G spectrum auction to engineer market structure by reserving spectrum for a new entrant, with guaranteed right to national roaming on regulated terms as a further form of entry assistance.[27] In the combined 4G auction Ofcom did not go quite so far, reserving spectrum for either a new entrant or H3G, but still used auction features such as caps and reserved allocations to ensure that the auction itself did not result in a diminution of the number of 'credible national wholesalers' below four.

The notion that spectrum auctions can and should be used to engineer market structures by reserving spectrum for new entrants is one that needs to be treated with caution. While the prospect of more competitors may be superficially attractive to policy makers, deliberate entry assistance to give artificial support to new competitors is not a one way bet. The attempt to use the 3G spectrum auction to create another competitor, supported by various other entry assistance measures, was rationalised at the time as being a transitional measure. Support would be strictly temporary and would rapidly taper with the new entrant expected to achieve the necessary scale to stand on their own feet within a short space of time. In the event, H3G has still not yet achieved the minimum efficient scale previously envisaged, even though differential 'entry assistance' regulation persisted for considerable time. In any event, spectrum is a scarce resource and there are trade-offs between the need for large blocks to maximise efficiency in use and small blocks to accommodate a larger number of successful bidders.

Avoiding market bifurcation and leveraging dominance from fixed to mobile

Ofcom may need to review its position on asymmetry of spectrum holdings in the light of any changes brought about by consolidation. In a world where speed and capacity requirements overtake coverage as a key dimension of competition, and relative spectrum holdings matter, previous views of required minimum holdings for a credible wholesaler based on shares of overall spectrum in a four player market may no longer be appropriate. Equally, against a highly asymmetric current background, Ofcom should be wary of allowing a single player to dominate mobile spectrum holdings on the grounds that if a little asymmetry is good greater asymmetry must be better. This concern applies especially where the MNO with the largest overall holding is also the runaway leader in terms of 4G ready spectrum, and potentially about to be acquired by the dominant fixed incumbent and virtual monopoly supplier of mobile backhaul.

This is not to argue for complete symmetry in spectrum holdings or a neutralisation of any competitive advantage. But Ofcom's previous lack of concern over asymmetric spectrum holdings was predicated on those with relatively less spectrum being able to deploy corresponding advantages in other areas to

[26] http://stakeholders.ofcom.org.uk/binaries/consultations/licence-variation-1.4ghz/statement/Statement_on_1.4_ghz_licence_variation.pdf

[27] This assistance was further supplemented by the policy of allowing asymmetric termination rates with that of the new entrant completely unregulated initially.

compensate. The risk is that this starts to unravel when all the advantages lie with the market leader and others are less able to exercise an effective competitive constraint. There is a real risk that a heavily lopsided or bifurcated mobile market dominated by the fixed market incumbent replaces the present 'end-to-end' competition between MNOs, resulting in less effective competition, less investment and innovation and poorer consumer outcomes. That is why effective measures to tackle enduring fixed line market power are critical to competition in mobile as well as fixed markets.

5. Fixed Access Networks: Investment and Regulation

Investment in infrastructure is rightly at the top of Ofcom's list of policy challenges that it set out in the Digital Communications Review discussion document. Ofcom has immense ability to determine the type and success of infrastructure investment in the UK, as discussed in the previous section, Ofcom's very clear policies created translated into auction deisgn created transparent investment signals in mobile.

In fixed markets, we have seen a variety of strategies adopted by Ofcom and its predecessor; starting with a duopoly, moving to full market liberalisation allowing market entrants to build network and compete. From 2000 we saw increasing incremental creep of access regulation in business markets. On the other hand in consumer markets, there has been a significant level of regulatory support for LLU based infrastructure investment. SMEs of course have been left straddling between the two, with consumer products offering high bandwidths, priced lower than traditional business products with comparable bandwidth, but with service levels considerably different.

Carving up markets and addressing separate customer groups with very different (and sometimes contradictory) regulatory policies does little to help any single investment case, except that of BT, who has an historic incumbency and an infrastructure cost base shared across all markets. This results in very different cost structures for CPs who are competing with Openreach in building network or with BTWholesale in buying Openreach network. This is because a single Openreach or BT property or duct could be used for a multitude of purposes, whereas a single market operator would not be able to recover fixed costs so widely.

Ofcom supported and successfully created LLU based investment policy in 2005, yet in 2009 it took a conscious decision to allow Openreach to provide a layer 2 wholesale bitstream product on its NGA platform. As a result, VULA became the industry norm. This is for all intents and purposes a higher speed bitstream product: in Ofcom's Strategic Review of 2003, Ofcom (and the market) dismissed bitstream based competition in favour of LLU competition and yet less than 10 years later, policy and products have returned to layer 2 based competition. Is this where we intended to be or could we aim for more: more investment, more choice, more capacity, and more coverage?

Ofcom's 2003 Strategic Review led to heavy investment in broadband delivering intense retail competition which has grown the market from 9.82m[28] customers at the end of December 2005 to 23.7m lines at the end of 2014[29].

This astronomical rise in broadband connectivity demonstrates the importance of fixed broadband in almost every household in the UK. It puts into context the significant importance of meeting customer expectations around speed and service. Concerningly, we see that currently over half of 'net adds' for high speed broadband on the Openreach network[30] are due to BT Retail which suggest a worrying reversal in competitive intensity.

[28] http://www.broadbanduk.org/wp-content/uploads/2012/08/0603-ukbbstatusreport-1.pdf
[29] http://stakeholders.ofcom.org.uk/binaries/research/cmr/cmr15/CMR_UK_2015.pdf
[30] http://www.ispreview.co.uk/index.php/2015/05/bt-top-7-71m-broadband-subscribers-with-3m-on-infinity-fibre-broadband.html

The worrying question for Ofcom must be whether we can back out of the cul de sac which is Openreach providing a bitstream product and BTRetail winning nearly 60% of market share? Can regulatory policy encourage alternative network investment in order to improve competition and therefore choice for consumers?

5.1 Today's regulatory framework: interconnection is not the same as access regulation

It might seem strange to reflect on 30 years of regulatory policy rather than look forward, but at the heart of Ofcom's role is sector specific ex ante regulation. It is clear that interconnect regulation is not the same as access regulation and yet sector regulators such as Ofcom together with ex ante telecommunications regulation have their roots in voice interconnection: the need for specific obligations placed on the incumbent operator in order to facilitate market entry through regulated any to any connectivity.

By their very nature, every such obligation, whether licence condition or latterly SMP obligations has been pro-investment and innovation. For instance regulating the terms of carriage for call terminatoin has allowed for market entry from a wide variety of suppliers. A single regulatory intervention, to say set a price for an interconnect product would both guard against an abuse of dominance and would also enable investment and innovation.

Whilst incentivising investment was taken for granted, the very nature of what was being regulated has historically been supported and enabled by interconnect regulation.

On the other hand, access regulation may guard against an abuse of dominance, but in and of itself does not encourage investment and is often designed to address a lack of ability to compete in building infrastructure. For instance imposing stringent price regulation on an access product in order to ensure that CPs and consumers are paying a price approximately at cost, fosters retail competition, but does not address investment. However weak price regulation will not stop an abuse of dominance and will leave consumers with higher prices and potentially encourage inefficienct investment, purely because charges are above cost.

Whilst interconnect regulation fostered investment in network services, access regulation, which is the primary tool that Ofcom has at its disposal under normal circumstances, cannot be used to foster investment in fixed access without removing regulatory protection in the short term. Another approach is required if competitive investment is to be enabled.

5.2 The Undertakings: surely everything is equal?

The current access regulatory framework is focused on preventing discrimination and abuses of dominance such as charging high prices for monopoly products. It does not attempt to address other abuses such as limitation of investment or innovation or the type of investment or innovation decisions.

This is highlighted and made clear by the very transparent Undertakings given by BT to Ofcom. It is convenient to believe that Equivalence of inputs and the Undertakings apply to everything and results in everything being the same, this unfortunately is not the case. In addition to a lack of policy or regulation to guard against poor investment or support investment, the current Equivalence framework and Undertakings also excludes a wide number of products and areas for discriminatory practices. A number of key ones are set out below:

Group Influence

Through the 'Annex 2' lists, the Undertakings explicitly give opportunities for BT Group personnel to have access to Openreach information and to be able to influence Openreach strategy and decision making, whilst the Openreach CEO reports to the BT Operating Committee. As a result, BT can and does make

investment decisions that are not subject to any regulatory oversight. The impact of those decisions might be subject to regulation, but once a decision has been taken to go down a particular investment path, the options for Ofcom are severely restricted. For instance BT decided to heavily invest in FTTC with little to no discussion with customers or the regulator despite its extraordinary impact on both the market (its competitors), consumers and UK capability. Once the decision had been served on stakeholders, the discussion focused on regulatory mechanics, not on the presumption of the decision itself.

One of the most transparent[31] acknowledgements of this collective strategy-making are the terms of BT Scotland's Board[32]. This is not a Board that runs a company or a department but is solely put together for the purpose set out:

> *"The BT Scotland Board brings together senior figures from across BT's lines of business to steer Scottish strategy and development.....The Board's objectives support the delivery and exploitation of communications technologies to enhance innovation and business growth in Scotland. Its current focus is on areas including high-speed broadband and the impact of Digital Britain, corporate business and public sector programmes, stakeholder engagement, skills, the environment and corporate social responsibility."*

This admission that BT is working collaboratively across Chinese walls demonstrates the lack of purpose or efficacy of the Undertakings to address strategic rather than operational discriminatory behaviour.

BT Group Property Strategy: An obstacle to competition

While BT has obligations to let other CPs interconnect with its network and rent space within its exchanges, its 2005 Undertakings include the presumption that any of those obligations are '*given on the basis that BT will be deemed to be acting reasonably if its actions are substantially consistent with its corporate property strategy and its objectives for NGN deployment*'[33].

At the time the intention was that the Undertakings didn't hinder any of BT's 21CN planned investment, however today BT's Group property strategy still creates barriers to competition, some of which are rooted in incumbency, but other barriers are more recent, with BT's technology choices influencing its property decision making, which in turn means less scope for competitive entry and for the first time in a decade an ever growing reliance on bottleneck BT network assets as CP co-location space can't be utilised for alternative NGA deployment.

From a regulatory perspective the current approach focuses on regulating what is there and available at the time, rather than what might be optimum from an industry and consumer perspective in the medium to longer term. This gives BT a relatively free hand to either remove current assets (for example closing buildings or platforms) or dictate the design specifics of a new platform or service, including determining the degree and level at which external CPs can interconnect. It is entirely possible for BT to design and create hand over points for products provided to CPs based on where it had vacant exchange space, or even the opposite: where it had no vacant exchange space. From a practical perspective the asymmetric nature of a CP's relationship with BT's network manifests itself in a number of ways, adding costs to a CPs business and capping the extent to which a CP can set the parameters for its own services. For example:

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[31] http://www.btplc.com/Thegroup/BTUKandWorldwide/BTRegions/Scotland/Theboard/Theboard.htm
[32] The BT Scotland Board includes employees from across all of BT's operating units including Openreach, BT Wholesale, BT Consumer and BT Group.
[33] Undertakings 7.1.1

- **CPs need to dig to BT:** To be able to offer widely available services CPs have to dig or purchase backhaul to BT locations. In the overwhelming number of cases BT's interconnect points with CPs are in or around BT network locations. BT therefore doesn't have to put the same effort or indeed capex into the interconnect arrangement as CPs nearly always dig to them.

- **CPs need to buy space in BT exchanges:** To provide services to end users CPs have to rent space and power from BT in exchange buildings. CPs are always behind BT in the queue as BT faces no wait for space and power when it wishes to connect its own end users because BT's own space and power considerations are always dealt with first (with internal processes), with only free space allocated and CPs charged the cost of any upgrade to accommodate them.

- **CPs are forced to follow BT legacy Topology when planning networks:** The topology of a modern greenfield network would be markedly different from BT's current network topology. It would contain far fewer buildings, with a much smaller number of sites whilst supporting as equally extensive access network. Yet to compete in today's market CPs must invest significant sums to mesh with this legacy BT network in order to obtain the lowest cost based from BT.

Having spent over a decade shadowing the BT network, investing in space within BT exchanges that is used for a variety of services, CPs now find that BT's technology choices for NGA services mean that this co-location space can't be utilised, making this space redundant for the roll out of new services. To compound matters, space that is being freed up within BT buildings and not being used is being added to the Openreach costs base, even though other BT divisions (such as TSO) were previously the largest user of exchange space. As the charges for vacant space fall to Openreach they are currently passed on by BT through higher regulated charges[34].

Strategic Technology Decision Making

As we have already mentioned, the Undertakings specifically allow for Group strategy decision making. The structure of TSO as a shared support unit between Openreach and other BT units can lead to a situation where technology decisions are taken independently of other retail CPs, and competition is all-too-often an afterthought. This is regardless of Openreach ultimately complying with its obligations to provide capabilities on an Equivalence of Input (EoI) basis which as we have discussed, apply to decisions that have been made and not to the making of those decisions.

When Openreach wishes to deploy a new technology, a whole raft of decisions will be made by BT as a group, for the group, rather than for the market as whole, which would be its modus operandii if those decisions were taken in Openreach and it was required to engage its customers in those decisions.

Next generation broadband access provides a good example. Even if it is accepted that FTTC is the right solution (compared to FTTP), the architecture deployed, which gave rise to VULA, may not have been the best to promote competition. TSO designed an architecture whereby the DSLAMs were served only by one set of fibres – this was economically the most efficient approach for Openreach. Industry were then

[34] See 9.42: http://stakeholders.ofcom.org.uk/binaries/consultations/cost-attribution-review/summary/review-bt-cost-attribution-method.pdf

engaged to specify VULA to provide bitstream service[35], but by this stage the architecture of a DSLAM in the cabinet, served by Openreach fibre, was a given. An alternate approach would engage CPs at the stage of defining the architecture. It may have been feasible to develop DSLAM equipment to serve multiple CP fibres – this would have been more costly, but have had the advantage of restricting Openreach to the bottleneck copper and preventing scope creep by creating new ones. In essence, the architectural decisions taken before industry engagement preclude what could have been better competitive outcomes.

This concept of a single nework design and decision making is demonstrated in this particular example:

The development of NICC standard ND1034 sets out the signalling specification between the Voice Application Gateway (VAG) and CP callserver in an FTTH environment. During the development of the standard, a single subject matter expert from BT TSO represents both downstream BT and Openreach in the industry standardisation groups. Whereas other CPs had to act and represent their organisation to ensure that their callserver could interact with the Openreach VAG, the BT TSO equivalent was doing this and also specifying the Openreach VAG itself. Clearly Chinese Walls would struggle to control a single employee's thinking and knowledge.

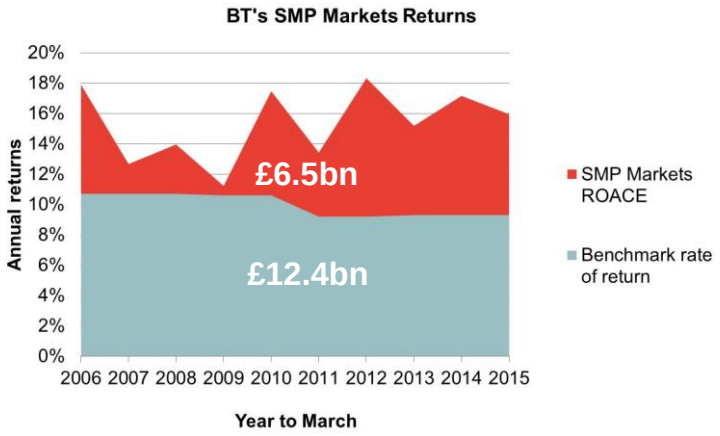
Furthermore BT's relationship with industry standards bodies is asymmetric: BT's representation at NICC is managed at an executive level by the Openreach CIO organisation within TSO, meaning that the interests of BT's retail divisions are represented by Openreach. It is difficult to see how, with this arrangement, the interests of BT retail divisions and competing CPs can be kept equal in the minds of Openreach.

Even if the integrated nature of TSO could be addressed, their design decisions are ultimately set within an envelope defined by BT Group; big infrastructure deployments must compete for funding with, for example, improvements to retail customer care or investment in content. This is natural within an organisation, but the structure of Openreach within BT Group means that the latter has more influence over investments than external CPs can exert.

5.3 Fixed Industry Profitability

So whilst we recognise that the regulatory framework and latterly the regulation of access have not focused on promoting investment, it would be expected that regulation *would* address the potential for over-charging as a result of market dominance. However as the Frontier report "Assessment of BT's regulated profitability" found in Annex 2 demonstrates; Functional Separation and SMP regulation has failed to keep Openreach in check. Frontier Economics has assessed BT's Regulatory Accounts for the last 10 years (incidentally the 10 years since Openreach was created) and found that BT has over-recovered £6.5Billion in regulated markets in that time period.

[35] Although we note that the GEA service provided by Openreach falls short of the relevant industry standards in a series of key aspects.



It might be convenient to argue that a variety of factors contribute to these super-normal profits: in one product it is due to volumes being in excess of forecast, in another market it is due to policy decision of regulatory forbearance, in another instance it is due to starting a charge control period with prices already in excess of costs. However, we see consistently that regulation, which was intended to stop straightforward monopoly abuses such as over-charging, has failed.

If we cannot apply the current regulation usefully and accurately, then it suggests that this regulation is not fit for purpose.

This is more than just a theoretical 'consumers are worse off' (although Frontier assesses that regulated prices would be 11% lower in the absence of overcharging during the time period, which would have been pssed onto consumers) snapshot of prices and profit; this is a reflection of the ability of firms to find investments and to make returns. Looking at these figures, it is hard to argue with the conclusion that the value of monopoly assets cannot be under-estimated.

[✂]

It would be simplistic to dismiss this as a debate about regulated prices, it is more profound and has far reaching consequences: fixed operators, and as a result of increasing convergence, mobile operators as well, will be weaker without sustainable profitability and opportunities for growth. We have found that industry profitability is concentrated in one corner of the market: in spite of some very detailed and specific regulatory intervention.

It is telling that 30 years of incremental regulation and Functional Separation have done little to equalise the market in the way expected at the outset. Considering Ofcom's deep market understanding and proactive approach to tackling market failure, we can only conclude that the failure lies not in the effort being applied, but in the methodology or tools being used. Access regulation alone appears to be insufficient to rein in BT.

5.4 Quality

It is well recorded that quality of service of delivery of both Openreach's copper and fibre products has fallen short of CPs', customers' and Ofcom's expectations. Specific and detailed QoS directions and SMP Conditions have been required in order to incentivise specific increases in QoS. It was fully expected that the Equivalence obligations in the Undertakings would create incentives for Openreach to provide a quality of service that met its customers expectations and willingness to pay. However this is far from reality.

[✂]

The UKCTA[36] report "30 Years After Privatisation: Is the Telecoms Market Working" highlighted this problem of poor service a year ago and recognized it as a problem across both copper and fibre based services. For instance:

- In the period August 2009-June 2014, Openreach never met its Shared Metallic Path Facility (SMPF) right first time targets.
- In the period July 2009-June 2014, Openreach never met its Wholesale Line rental (WLR) right first time targets and
- For more than 2 years from April 2012 to June 2014 Openreach has not met its targets for on time Ethernet provisioning.

Poor service is not a new problem, but despite (or because of?) Openreach being an extremely profitable business, there has been little focus on quality.

This poor level of service is further compounded by the use of 'stop the clock'[37] on Ethernet services. This masks the reality of the customer experience by improving KPIs and also reducing SLG payments. This has a significant impact on end customers: it means customers have no certainty over delivery dates, it increases costs due to uncertainty and the poor service reflects on CPs, not Openreach.

In Ethernet, regulation has focused on the requirement to make SLG payments in order to incentivise better service delivery, however this has been ineffective for two reasons: the majority of costs for those payments have been recovered through regulated costs stacks and secondly it appears that it incentivises Openreach to create a cottage industry in avoiding SLGs using contractual carve outs, rather than addressing service performance.

It is clear that Functional Separation has not given Openreach the customer exposure or market scrutiny that a separate, even monopoly company would enjoy. The protective corporate umbrella of BT means that Openreach's largest customers (BT Consumer, BT Business and BT Global Services) are unable to speak out about poor service and the collective voice of external customers has not been sufficiently motivating for Openreach to put in place the necessary changes.

It is therefore inexplicable that whilst this level of service is being delivered to its customers, Openreach has been able to over-recover on its charge control (as highlighted by Frontier Economics report found in Annex 2). In spite of the generally recognized failing in quality standards, we still find that Openreach is maintaining arguments[38] to reduce performance targets and therefore its liabilties, rather than getting on with delivering and exceeding customers' expecations.

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[36] http://www.ukcta.org.uk/public-2014/Development_of_UK_Telecoms.pdf

[37] Openreach uses 'Stop the Clock' or 'Deemed Consent' to avoid counting delays in delivering services where it decides that it is not BT's fault. However this has also been used where a lack of engineering resource or network build is required, matters which are in BT's control. The effect of this is that, using Deemed Consent can reduce SLG payments for late delivery. Vodafone has recently submitted a dispute to Ofcom over the misuse of Deemed Consent and the avoidance of SLG payments: http://stakeholders.ofcom.org.uk/enforcement/competition-bulletins/open-cases/all-open-cases/cw_01165/

[38] Para 329 http://stakeholders.ofcom.org.uk/binaries/consultations/bcmr-2015/responses/Openreach.pdf

5.5 The value of Incumbency and the asymmetry of (regulatory) risk

Despite detailed regulation and intense scrutiny we find that Openreach and BT deliver greater profitability than the rest of the industry combined.

Let's look at two investment cases and compare the treatment of BT's historic investments compared with those of CPs to demonstrate the asymmetry of risk that applies to investments of BT and CPs:

- A number of CPs have invested heavily in LLU, installing network capability in BT exchanges and in doing so made considerable progress in increasing the number of broadband lines in the UK by 14m in the 9 years to December 2014. This investment became stranded when BT (with Ofcom's support) decided to offer an NGA product, GEA, which does not require local network reach.
- Compare this with Ofcom's detailed assessment of costs in BCMR, where conservative assessments are made and full cost recovery of historic and common investments is a premium policy objective in setting dark fibre pricing.

These are by no means isolated examples: Ofcom set out in as early as the FAMR 2013 that it would be considering cost orientation obligations for Openreach's VULA product in the next FAMR (effective April 2017), and yet in the 2015 BCMR consultation is propopsing policy that undermines CPs' investments in EAD network reach overnight.

It is clear that BT's incumbency has a value: it means that historic investments are subject to much less regulatory risk even whilst it is investing in new technologies. On the other hand CPs historic investments are undermined rather than leveraged by regulation. A curious situation when the whole purpose of ex ante regulation is to control dominance, regulatory policy appears to favour BT's investments in two dimensions:

- Regulatory policy takes a risk adverse approach to recovery of BT's historic costs and yet does not consider CPs sunk costs when making policy decisions
- Regulatory certainty is valued and provided to BT, but is not provided to the same extent to CPs.

This regulatory bias means that at all phases of the invesment cycle BT is both assured of recovering sunk costs and given opportunities to invest. Whilst this may be based on sound individual policy decisions, taken as a whole it has a significant distortive effect on the ability of other parties to invest. The Frontier report at Annex 2 makes an initial assessment of VULA prices and costs based on the data available in the published RFS. Whilst those costs are aggregated in the WLA data, Frontier notes that

> *"...despite the inclusion of VULA services in the reported WLA returns in the last two years, this has not resulted in BT being unable to earn a return equal to its cost of capital across the WLA market. This suggests the VULA, which is not currently charge controlled, is not in a period of 'start up losses' where penetration is too low to cover fixed costs."*

This suggests that regulatory forbearance in order to manage risky investment and to provide commercial freedom has been entirely unnecessary, leading just to complex and unwieldy retail margin squeeze regulation, a lack of transparency and uncertainty for consumers. Taken together with the decision to allow Openreach to offer VULA and therefore remove any incentive to develop Passive access based products such as SLU and PIA, BT has been given a unique position in which to invest with a low level of risk and an opportunity to recover costs in a monopoly infrastructure market. CPs ability to compete may be reflected in the net adds market shares where BT is currently winning 60% of this nascent market.

There is no doubt that CPs are not sufficiently credited for their industry investments and that little is done to make CPs' networks and historic investment central to policy making. Whilst it is easy to argue that BT is a CP too (in the form of BTWholesale) and therefore it must be subject to the same policies as other CPs, this is not entirely true. For instance BTW has a presence in every access exchange that Openreach is in, and therefore when legacy services reduce in size it sees no increase in redundant property or network overhead, which an external CP does. BT can look at the end to end business case of NGA roll out taking account of all costs and benefits from Openreach, BT Wholesale and BT Consumer and Business, a downstream CP looks at a much more isolated case.

Ofcom's support for investment is vital to its success. However backing a policy is not sufficient; it requires wholehearted commitment to address anomalies and relative differences in starting positions: to create the conditions for competitive investment, policy must address the hurdles and not assume that the opportunity, risk and reward are equal to all parties.

5.6 USO funding

BT has enjoyed the fruits of BDUK not-spot funding to extend its network and increase its asset base. The NAO estimates[39] that BT has enjoyed £1.7billion of public funding to deliver superfast broadband into areas that were understood to be not commercially viable. The advantages of incumbency were clear throughout the project: manifesting itself throughout the bidding and delivery process:

1. Defining the projects: BT has defined the coverage (and not coverage) map of the UK through *its* view of commercial risk and investment. Consequently, it has defined the areas that required public funding and whilst one might argue that these areas are the same for all bidders, in reality the size and location of not-spots result in a lack of contiguity and therefore scale – unless of course you also happen to run a network next to that being bid.
2. Bidding for the projects: During the bid process information about the network was made available to bidders upon request, however that presupposed that a bidder knew what information was available – something that a BT employee would have a better feel for.
3. Project Delivery: BT did not have to use its own processes in order to roll out network (PIA, and yet other CPs were subject to those unproven industry processes), products or costs. The NAO has said that BT has delivered the capability in one particular location 20% cheaper than another provider could do so. The NAO suggests that this is due to its purchasing power. Our understanding of costs, suggest that even if those elements that were purchased (cabinet, power, cables) were given away, it would not deliver a 20% overall cost reduction. Rather, BT can deliver more cheapily because of its incumbency: not having to use formal Equivalent products to use its ducts, as other CPs would need to do and being able to use existing dark fibre in its own network. Whilst it is able to do this, the tender process was always unlikely to deliver a truly competitive award.

And despite this funding, the final 5% of the UK remains without broadband. It feels inconceivable that BT should be able to obtain more funds, virtually uncontested, to extend its network reach: Publicly funded networks which essentially revert to BT's ownerhip after 7 years, as this is the point where it can retain all profits. Significant thought needs to be given to the design of any future public funding schemes to ensure it does not entrench the very monopoly that BT is currently refusing to serve.

[39] http://www.nao.org.uk/wp-content/uploads/2015/01/The-Superfast-Rural-Broadband-Programme-update.pdf para 1.6

5.7 What next for investment policy?

So we can see that the current regulatory framework includes a variety of gaps, loopholes and indeed perversions that have resulted in an entrenchment of Openreach's market position by allowing it to make incremental investment in high speed broadband where it chooses to do so, on its terms and capture public funding elsewhere. This surely cannot be the future of the UK market?

Structural Problem	Impact
Structure of publicly funded projects	Maintaining and increasing BT's monopoly with public funds used to manage commercial risk.
Asymmetric bias to risk in regulated decisions	BT's historic investment deicsions are factored into forward looking costs, but CPs investments are not addressed.
BT provided with a regulated risk cushion	Price controls take a cautious approach to forecasts and ensure recovery of historic investments.
Ineffective access regulation	No ability of access regulation alone to incentivise CP investment and cautious implementation results in over-recovery with poor service.
Undertakings which allow for strategic pan-BT decisions making	FTTC rather than FTTP investment path and GEA product designed on the basis of technology that BT chose.

Access regulation does little to incentivise or support investment; however there is no denying it is necessary to pro-actively manage potential abuse of dominance and discrimination. How then do we enable competitive investment and at the same time manage potential abuse of dominance?

Looking back into recent history, in 2005 Ofcom put in place, not just regulation to ward against abuse of dominance in access markets, but a full access investment strategy. Ofcom had a primary objective to incentivise LLU based investment. It did this through a combination of ex-ante regulation, structural solutions and pricing decisions across the whole broadband market. As a result, a number of market players (that eventually consolidated into 2-3 major players) were willing to invest in the market. This very coordinated and targeted approach to network investment was necessary as previous attempts to encourage LLU based investment with ex ante regulation and dispute resolution alone had failed.

Since that time, BT has invested in Superfast broadband, and we note that simple SMP regulation (with very lightweight remedies in order not to curtail BT's appetite for investment) have been put in place. As a result, the current market offers little in the way of differentiation. We find the same product being sold in broadly the same way from a number of different brands. Not only that but BT's retail market share of this nascent product runs at a staggering 72%. Products are the same across the market and a very high proportion of the value of the product sits in Openreach. Surely the market deserves more choice, more competition and more investment? These are essentially the questions that Ofcom sets our in the Digital Communicatons Review. We believe that these objectives are best achieved by greater fixed network competition via **multi-operator investment**. In order to achieve this:

- Ofcom should foster such investment by **ensuring effective access to Openreach's passive infrastructure**;

- Passive infrastructure access would be more likely to succeed if those passive assets were structurally (or at least functionally) separated from the rest of BT; and
- If the environment for multi-operator investment cannot be delivered then the current Openreach should be structurally separated to address ongoing issues of discrimination and poor service.

6. The need for multi-operator fixed investment

Vodafone urges Ofcom to consider improving the opportunities for alternative operator infrastructure investment. The monopoly of BT- or even the duopoly of BT and Virgin are simply not enough to deliver the step-change which the UK market requires. Therefore, we believe that multi-operator investment should start with a far more effective regulatory regime for regulated access to Openreach's ducts and poles. We deliberately start here because evidence from other countries demonstrates that, taking Ofcom's headings in the SRDC as our guide, such regulatory action can improve investment, encourage sustainable competition and better target regulation. Differentiated retail offerings based upon different wholesale inputs will also encourage operators to positively promote those differences to consumers thereby increasing choice and empowerment. Such regulatory action could make significant improvements to the UK market whether BT remains vertically integrated or not. That is, these actions are compatible with but not dependent upon any particular decision taken regarding revised functional or structural separation.

Vodafone does not underestimate the difficulties involved in establishing an effective passive access regime.[40] We attach at Annex 3 a confidential report prepared for Vodafone of various passive regimes around Europe. We find that there is no clear link simply between the length of time since introduction of a regulatory passive regime and successful alternative infrastructure deployment. Instead, multi-operator investment appears to be dependent upon a complex interplay between:

- incentives on the incumbent to make passive access work operationally, (ideally because it is itself an access seeker for some significant footprint of homes);
- the state of and policies to foster ongoing investment in the underlying passive infrastructure; and
- a regulatory regime which rewards alternative investment via roll-back or limiting of regulated access to active products where alternative investment proves viable but does not over-reward past copper investment by the incumbent.

Notwithstanding these interlocking requirements, experience from Portugal, Spain and other countries demonstrates that, with sufficient regulatory effort, an effective passive regime can unlock considerable co-investment both between two or more alternative operators and between them and the incumbent (even in the absence of structural separation). Vodafone's experience in Portugal is particularly illuminating. Vodafone Portugal reports that it was only when Portugal Telecom decided it could not effectively frustrate Vodafone's fibre build (based upon PIA) that it agreed a commercial co-investment deal with Vodafone Portugal and as its incentives became aligned with those of Vodafone Portugal, it improved operational effectiveness without the need for regulatory disputes. This is described further in Annex 4.

6.1 The relationship between passive access and structural separation

While the opportunities for discrimination towards downstream competitors may be reduced under a passive access regime, the incentives on a vertically integrated incumbent remain unchanged. Therefore, Vodafone

[40] This will principally be based, we expect, upon the assets of the SMP operator, but with the passing into law of the Civils Directive, need not always be so. Access to non-SMP and non-telecommunications assets may be included.

considers that regulated duct and pole access could be far more effective if introduced together with the structural separation of BT at the duct and pole level. This new 'AssetCo' Openreach would be focussed upon improving, deploying and monetising the best possible passive infrastructure to enable competitive fixed fibre deployment wherever viable. It would have no need or desire to discriminate against its downstream customers and would be incentivised to make duct access (its fundamental product) work.

On the other hand, if Ofcom believes, for whatever reason, that it cannot enable effective regulated duct and pole access and that this will prove a sufficiently strong foundation for viable multi-operator fixed investment we think it is left with the inescapable conclusion that Openreach's access network is an enduring bottleneck. Behavioural remedies will always be second best, open to information asymmetries and regulatory gaming and as we have discussed in section 5 of this document, fails to address a number of areas of dominance. In this case, Ofcom should press on with full structural separation to address BT's incentives and ability to discriminate against competing retail providers. Specific governance rules, roll out of KPIs and ownership rules (for instance enabling other CPs to take a minority stake in Openreach) could be envisaged to overlay structural separation and meet other Ofcom objectives.

In these circumstances we believe that structural separation (at the existing Openreach boundary), would make infinitely easier various models of 'co-investment' which have long been favoured by Vodafone[41] as a means of encouraging fibre roll out, ensuring long-term deregulation of fixed markets and ensuring effective competition to drive innovation and customer benefits.

Such a step would not fully address the inherent bias within Openreach (whoever owns it) to favour copper over fibre and active wholesale products over passive ones but it would address current issues of discrimination, make the regulation of that entity simpler and more transparent and allow the introduction of other targeted policies to address these roll out issues.[42] BT too, appears to put considerable new emphasis in its recent announcements upon co-investment models[43] and its 'never say no' policy but this does not address the fundamental problem which is that competing providers find it extremely unattractive to co-invest with BT when it already dominates the retail fibre market. Concerns over unfair treatment, and loading of costs on competitors' inputs will always prevail as long as BT is vertically integrated.

BT also commissioned KPMG[44] to analyse the economic impact of its latest proposed G.Fast roll out which was calucluated at £20-£30bn. Vodafone notes that KPMG sets out 3 potential structural separation counterfactuals but then does not actually compare its proposed GDP uplift against any of them. In fact it only compares an investment vs. no investment scenario. This is precisely the point. BT should not be in a position where it alone decides whether investment or improvements to UK fixed broadband take place.

[41] See for instance, Oxera's report for Vodafone from November 2011: "How a co-investment model could boost investments in NGA networks"
[42] For instance, ensuring that Government funds or to increase rural broadband speeds via a telecoms levy are, indeed, used to improve the underlying network.
[43] http://bt.mynewsdesk.com/pressreleases/bt-ceo-delivers-vision-for-britain-s-digital-future-1222020?utm_source=rss&utm_medium=rss&utm_campaign=Subscription&utm_content=pressrelease
[44] KPMG Delivering Britain's Digital Future: An Economic Impact Study A report for BT 22 September 2015

BT has publicly and repeatedly described the New Zealand experience of structural separation as a 'disaster'.[45] In fact financial analysis demonstrates that overall shareholder returns have been strong and the network business has had the ability to continue investment.[46] We set out further in Annex 5 why separation has been positive for downstream customers based upon the direct experience of Vodafone New Zealand which is active across mobile and fixed markets there. This annex shows that the voluntary structural separation of Telecom New Zealand into a network business (Chorus) and a retail business (Spark) has:

a. removed significant regulatory burdens delivering a simpler and more effective regime;
b. supported a step-change in retail competition; and
c. improved Chorus' focus on commercial product development around the needs of its downstream customers.

We do recognise that Ofcom could choose to apply different solutions to different geographic sub-markets based upon the feasibility of or actual rollout of alternative infrastructure based upon passive access. Moving regulation upstream to passive inputs where feasible would represent 'regulatory roll-back' (one of Ofcom's overall objectives). In other geotypes where ducts and poles either are not sufficiently available or population density means that these areas cannot sustain alternative access networks, regulated access to an active wholesale product like VULA will still be required. Finally there will be areas where public subsidy will always be required to roll out fibre. Structural separation at the passive layer will be best suited to those inner areas while separating at the existing Openreach boundary may be more appropriate for the outer areas.

We turn now to discuss our concerns with the current UK fixed access market grouped into those that arise from BT's access monopoly, those inherent in vertical integration and those related to BT's ownership of sunk copper assets.

6.2 Problems arising from BT's access network monopoly

BT remains the monopoly provider of fixed access network connections to a very substantial proportion of the UK population, a situation which has changed little in the UK since the last substantial investment in non-incumbent access infrastructure was made by the cable industry (now Virgin Media) two decades ago. Virgin Media's decision not to offer wholesale access to its network means that BT remains the monopoly provider of wholesale broadband services throughout the country and is relied upon today by every significant retail competitor to BT except Virgin.

In its 2005 Strategic Review, Ofcom took regulatory action to enable passive access based competition by kick-starting Local Loop Unbundling. This is now almost universally seen as a major policy success. But as the UK began upgrading from copper to fibre, Ofcom sought to constrain BT's monopoly power rather than

[45] See for instance: http://www.telegraph.co.uk/finance/newsbysector/mediatechnologyandtelecoms/telecoms/11478655/BT-lashes-out-in-battle-over-future-of-broadband-network.html

46 See Redburn Telecommunications Services, Why BT Should Volunteer the Split 24 September 2015 *"We show that contrary to BT's assertions, the New Zealand separation is working well for shareholders (now that mistimed copper price cuts have been substantially reversed), customers (with new retail entry) and the government/society.""*

promote competition to challenge it. Consistent with this, Ofcom has allowed the key focus of its wholesale fibre regulation to be upon an active (VULA) rather than a passive product and has been very cautious in promoting passive remedies which might be expected to further extend network competition over BT's duct and pole infrastructure, arguing that there was limited demand from market participants. It is true that, in recent years, Ofcom has taken some steps to extend passive remedies, notably through the introduction of Passive Infrastructure Access to Openreach's ducts and poles in 2010 and recent proposals to require BT to offer dark fibre in the recent Business Communications Market Review. But these have been extremely cautious steps, hedged with caveats and restrictions. These processes have not been industrialised, are not fit for purpose and, therefore, have unsurprisingly failed to have any significant impact on the market. Annex 4 sets out the differences between the PIA product in the UK and that in Spain and Portugal where it is seen as a viable product.

Recent and growing demand for ultrafast broadband services (which BT does not currently meet) appears to have given some stimulus to access network competition, both in the UK and elsewhere in Europe. Small fibre providers such as Gigaclear, CityFibre and HyperOptic have emerged in the UK but these are miniscule in comparison with the much larger investments in non-incumbent ultrafast FTTH networks which have been made in countries such as Portugal, Spain and France where passive products have been the primary focus of regulatory action. The UK market remains dominated by the BT access network monopoly, whilst the Government's allocation of public subsidies to BT on (until very recently) an exclusive basis in order to extend superfast FTTC deployment in the UK has tended to reinforce BT's monopoly network position rather than challenge it.

But, as set out in Annex 4 the examples of Portugal and Spain show that with determined regulatory action far greater fixed network competition can be ensured than Ofcom considered possible. That report makes 5 key recommendations to improve PIA access in the UK:

a. Streamline the process for access and reduce the cost especially of ancillary services;
b. Create an online database of existing infrastructure;
c. Reserve duct space for alternative operators or create it by requiring the SMP operator to remove dead cables;
d. Enable effective use of poles as these are likely to play a significant role in roll-out given the UK's high proportion of SDUs; and
e. Codify the rules for in-building wiring.

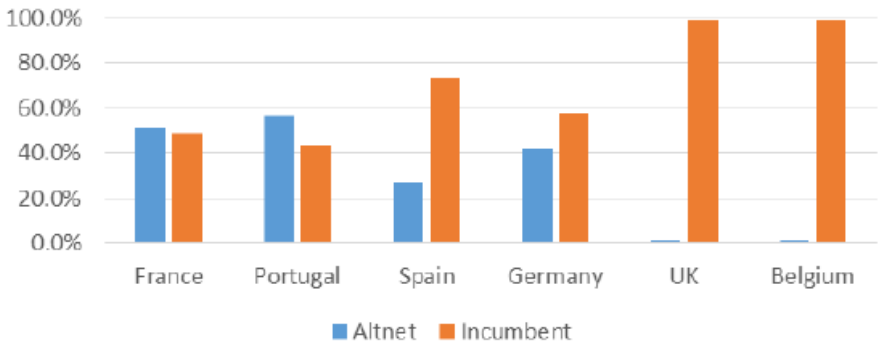
It is also clear from those countries that significant consumer benefits can be achieved. FTTH not only provides higher speeds and lower fault rates but, often overlooked, also much quicker switching processes, greater innovation and focus upon quality differences leading to improved customer satisfaction. Compared with the vibrant multi-operator competition which we see in those markets, the relative weakness of the current UK situation is apparent when one considers just how similar some of Ofcom's concerns are today with the situation prior to Local Loop Unbundling. In 2004 it said:

> *"Past regulatory attempts to secure fair access at wholesale level to BT Group plc's networks and facilities have also led to a large and growing range of detailed regulatory interventions, and at times regulatory micro-management of BT Group plc at different points in the value chain, which can set conflicting*

incentives both for BT Group plc and its competitors and encourage commoditised competition on the basis of regulatory arbitrage."[47]

A recent paper by Tony Shortall and Martin Cave has compared the outcomes of those countries such as France, Portugal and Spain which have concentrated efforts on improving network competition with those, including the UK that have focussed upon regulating monopoly fibre access. The chart below shows the proportion of fixed network investment made by incumbents and alternative providers across those countries.

Figure 10 - Telecom Network Operator type across countries in 2014



The authors conclude that focussing so exclusively on monopoly regulation has left countries like the UK with an unbalanced investment profile and weaker long-term competition as a result. In comments strikingly similar to those expressed by Ofcom in 2004 (quoted above) they conclude:

In terms of the structure of competition in the market, those countries following the 2008 draft of the NGA Recommendation [France Portugal and Spain] appear to be capable of achieving a level of network competition which may be self-sustaining, whilst other Member States that followed the final version [UK and Belgium][48] appear to have ended up with weaker competitors which are likely to be wholly reliant on regulation for the foreseeable future.[49]

It is clear that the absence of network competition leads to the main challenges arising from BT's continued monopoly in the UK. This takes several forms, the most significant of which are:

a. BT currently has little or no competitive incentive to invest in upgrading its network to fibre (FTTH) in order to deliver ultrafast broadband services (absent competitive pressure from Virgin Media). BT had initially said it expected 25% of its superfast lines to be FTTH, but has since abandoned that pledge and FTTH deployment in the UK is and is likely to remain amongst the lowest in the OECD. BT is

[47] TSR2 Foreword

[48] The authors note that Germany is an unusual example where Vodafone has invested significantly but remains highly dependent upon the DT network because in an FTTC architecture, the Vodafone network is not 'free-standing' in the sense that it cannot deliver services to end consumers without the DT access network.

[49] Is Symmetric Access Regulation a Policy Choice? Evidence from the Deployment of NGA in Europe Communications and Strategies No. 98, 2nd Q. 2015

instead committed to retaining its existing copper network and upgrading its performance in future using new G.FAST technologies. This is in sharp contrast to markets like Portugal and Spain where competition drives operators' investment and FTTH roll-out plans.

b. BT has **no competitive incentive to extend the coverage of superfast networks** beyond the areas it determines to be viable or where it faces competition from Virgin. As a result, the UK Government, European Commission and local authorities have made significant contributions (of over £1bn) to subsidise the roll out of BT's FTTC infrastructure to the last third of the country

c. **Competition and innovation in downstream markets is largely determined by Openreach's network capabilities and network investments**, upon which all retail providers – both BT and its rivals - depend. We explain later that BT's vertically integrated structure means that Openreach has little incentive to enable BT's downstream rivals to innovate or differentiate from BT, whilst regulation also makes it difficult for them to differentiate from each other.

d. All major UK retailers depend upon Openreach for critical inputs. This means that if Openreach fails to deliver, as appears to have been the case for significant periods of its 10 year history, then the **consequences of Openreach non-performance are unavoidable and affect the whole market**. As a monopolist, Openreach has weak incentives to improve its quality of service, since it will retain captive customers whatever it does.

6.3 Problems that arise from the vertical integration of BT

Another key regulatory decision beyond that of focussing regulation upon a monopoly active fibre product is that BT should remain a legally integrated entity, subject only to 'operational' or 'functional' separation. As a result, BT remains a vertically integrated business and retains both the incentive and the ability to engage in discrimination against rivals to BT's own retail businesses in the downstream market.

The problems of vertical integration and monopoly are clearly related. Vertical integration is less likely to give rise to concerns if the vertically integrated firm faces competition from others. Vertical integration becomes much more of a concern as BT retains a monopoly or, at the very least, a dominant position over the network inputs which its rivals require in order to be able to compete, effectively or at all, in downstream markets. A local network monopoly means that competing with the integrated firm is only possible in downstream markets.

Various issues with vertical integration are identified by Ofcom and others.

a. One, which appears to puzzle Ofcom, is that **the combination of vertical integration and equivalence have not incentivised Openreach to deliver an adequate quality of service** to its wholesale customers, including, potentially, BT's own retail divisions. Ofcom admits that it had previously assumed that BT's own (significant) interests in the downstream market would be sufficient to ensure that Openreach supplied an adequate service to BT Retail, and that non-discrimination rules would then ensure that this was extended to BT's rivals as well. Experience since 2005 demonstrates that this has not happened, with Openreach's customers reporting very poor performance in the installation of new lines (where customers must accept very long waiting times, engineers often miss appointments and faults often arise afterwards) and in the maintenance and repair of existing

Openreach plant (resulting in high fault rates and long delays in repairs).[50] This has already prompted Ofcom to intervene directly following the last Fixed Access Market Review to introduce backstop quality of service targets for Openreach but even Ofcom would admit that regulatory protections like this do not deliver the 'best in class' performance we should be aiming for.

b. Another explanation for Openreach's lack of performance may be that **vertical integration presents BT's management with too many competing demands on their limited time and capital resources.** Its overall flat capital expenditure even when rolling out FTTC suggests Openreach has been unable to secure sufficient financial resources whilst other parts of BT have little difficulty investing in acquiring content rights or other assets deemed necessary for the downstream BT businesses to compete. On this view, current arrangements mean that BT management are incentivised to invest time and capital in those (unregulated) areas where BT can hope to obtain a degree of differentiation from its rivals, whilst minimising investments in areas, like Openreach, where opportunities for differentiation are denied to them by regulation. In other words, BT concludes that owning exclusive content which others cannot access is more valuable than poor network performance which all will endure equally. This may not only explain Openreach's poor performance in delivering existing copper and FTTC services but also, in part, why a vertically integrated Openreach would be unlikely to invest in upgrading to FTTH in the future. Allied to this concern may be that BT[51] is simply too large and complicated an organisation to be run effectively. As Openreach is undertaking investments and projects upon which all of BT's downstream competitors rely it will always struggle to achieve sufficient management focus as against those projects which benefit BT alone.

c. Another explanation is that **BT may calculate that the established BT retail brand is better positioned to tolerate poor performance by Openreach than those of its rivals.** On this view, BT's existing customers may be more tolerant of faults (the 'uncontestable rump' who never consider switching from BT), or customers of rivals may assume that BT's quality will be superior to that of its rivals if they experience poor service. Ofcom research supports the finding that performance problems affect BT's rivals disproportionately,[52] so that even if there is no clear discriminatory intent (which Vodafone does not accept) the effect is nonetheless discriminatory. This is the case, for example, if BT fails to install new lines in a timely fashion if a large proportion of those lines are required by BT rivals when customers decide to switch away from BT.

d. It may be that **vertical integration prevents the efficient financing of Openreach** to the detriment of its performance. Vertical integration makes BT a more complex business and limits its capacity to leverage debt against the utility-like cashflows of the Openreach business (thereby raising its cost of

[50] See in particular the report prepared for UKCTA in November 2014 "30 Years after privatisation: Is the Telecoms Market Working?"
[51] Particularly if it acquires EE as well.
[5] See evidence from BDRC Contintental quoted in the UKCTA report "30 Years after privatisation: Is the Telecoms Market Working?" at p. 102 that 28% of Businesses and 35% of consumers agreed strongly or slightly that *"you are less likely to have a problem with service installation or repair from BT than with competitors"*

capital relative to that which could be obtained by a standalone Openreach). Moreover, BT is able to recycle Openreach profits into retail investments such as content rights which could not be justified on a stand-alone retail basis. This allows BT to leverage wholesale dominance into adjacent retail markets.

e. Aside from Openreach's poor performance and lack of investment in general, there are the more fundamental concerns that existing arrangements allow Openreach to **discriminate in favour of BT's own downstream interests and against those of rivals.** Few dispute that a vertically integrated firm facing downstream competition will have incentives to discriminate in this way. Indeed Ofcom itself accepts this within the SRDC, but the question is whether the existing regulatory arrangements governing Openreach provide sufficient safeguards against this. Examples of discrimination include:

    i. **BT Retail does not buy Openreach or BT Wholesale products on the same terms as its rivals** – Openreach and BT Wholesale sell products which are 'equivalent' to the inputs BT uses but not exactly the same. Ofcom provides the example of BT Retail buying WLR and SMPF from Openreach, whilst rivals like Sky rely on MPF products instead. Thus even if Openreach provided the same quality of MPF to all customers, it may still have discriminatory consequences for those seeking to compete with BT itself.

    ii. **Discrimination in areas such as a delivery of services or repairs is often very difficult to detect** and these activities have often not been subject to explicit performance targets in the past. [53] As we explained earlier, the effects of poor performance can be discriminatory, even if the intent is not. In any event, it is the effect that matters. For example, poor performance may drive customers towards the perceived 'safe haven' of BT, or may disproportionately affect those who rely upon the services in question.

    iii. **New product development by Openreach is biased towards the interests of BT's downstream businesses rather than its rivals**. This appears to be a significant factor in explaining the poor performance of BT's rivals in the provision of services to SMEs and businesses. Openreach has clear incentives to resist requests for products which might allow rivals to compete more effectively with BT's downstream lines of business[54] or which would involve cannibalisation of BT's existing revenues (such as leased lines for businesses). More generally, Openreach has limited incentive to allow BT's downstream rivals to differentiate their products from those offered by BT itself, whilst the non-discrimination provisions required to police vertical integration mean that BT's rivals also struggle to differentiate

[53] See for instance Vodafone's dispute with Openreach opened by Ofcom in September 2015 relating to the systematic misuse by Openreach of 'deemed consent' to obscure true delivery performance and reduce its liability to contractual SLG payments.
[54] See for instance Openreach's perfunctory rejection of Vodafone's SoR in respect of dark fibre.

themselves from each other Ofcom has noted widespread concerns with the existing Statement of Requirements process[55] but has not, as yet, taken any fundamental steps to reform it.

iv. **Cost allocation:** Recent work by Cartesian on behalf of Ofcom has established significant misallocation of costs to BT's overall benefit. This has the effect of increasing the cost of regulated inputs relied upon by BT's competitors whilst benefiting BT's unregulated business.

v. **Price discrimination**: It has been alleged by Talktalk that BT has engaged directly in margin squeeze to inhibit downstream competition in the superfast market. While Ofcom currently considers that BT passes this test it is clear that with the inclusion of sports costs and other complications which will result from the combination of BT's fixed assets with those of EE carrying out a meaningful margin squeeze test is increasingly difficult.[56]

Concerns about non-price discrimination have also increased since BT has begun to develop its superfast broadband business (after 2008) and BT's rivals have had to rely upon Openreach's VULA product to compete.[57] This has two aspects. In the consumer market, BT's broadband market share has begun to inflect and has grown by around a percentage point a year for each of the past five years, reflecting BT Consumer's disproportionately large share of superfast net additions (relative to their share of ADSL connections). In the business market, the benefits of BT's FTTC deployment have been less apparent to customers, in part because the Openreach FTTC roll out seems to have avoided areas where businesses are located and in part because Openreach has failed to develop 'business ready' versions of the VULA product. BT's rivals are forced to rely upon existing Openreach products, mainly leased lines, instead.

f. Finally, even if existing regulatory arrangements had proved capable of addressing the concerns about vertical integration identified above, the behavioural remedies chosen by Ofcom after the last review appear to come at a cost of **significant and growing regulatory complexity,** involving significant commitments of time and resources on the part of BT, Ofcom and BT's competitors. Experience since the creation of Openreach suggests that whilst regulation may address some aspects of BT's integrated structure, others will inevitably emerge over time, perhaps as BT moves to exploit gaps in the regime and perhaps because of unintended consequences arising from earlier interventions or other changes in the market. Either way, the application of behavioural regulation to solving the challenge of vertical integration has, as Ofcom note wryly, left it with some 'practical difficulties'.

[55] Para 11.38 of SRDC

[56] Ofcom has already acknowledged the high degree of complexity in the VULA margin squeeze test possibly getting worse if the EE acquisition is approved. See CMA Summary of Hearing at paras 60-61.

[57] Ofcom considers 'revising the Openreach boundary' in the SRDC (para. 1.37) but we note that, in fact, the boundary moved when an active fixed residential product (VULA) became the primary means of supplying wholesale access. Some of the current problems with Openreach discrimination and poor QoS may originate in this move up the value chain by Openreach.

Simply moving the focus of regulated remedies on ducts and other forms of 'passive infrastructure' does not directly affect this incentive to discriminate and therefore may raise similar 'practical difficulties' if unaccompanied by other regulatory action. BT has strong incentives to argue that its existing duct infrastructure is unable to accommodate fibre from rival providers (or only to do so at great cost), or to manage these assets in such a way that BT is able to favour its own needs over those of rivals (perhaps by not investing to expand capacity beyond its own needs). Vertical integration also means that BT has incentives to push the boundary as far downstream as possible in order to capture as much of the value as possible. In the Openreach/Retail case, this involved BT seeking to favour its own downstream retail activities so as to capture retail profits. In this case, it means Openreach seeking to extend its scope into active products such as VULA in order to eliminate competition which might otherwise emerge using assets such as ducts or unbundled fibre.

BT generally argues that common ownership allows it to better co-ordinate investments in its network with the retailing activities of its downstream operations (overcoming the so-called 'hold up' problem). For example, BT often claims that Openreach was only able to undertake the investments it has recently made in FTTC because BT knew that its own retail businesses would promote the superfast products aggressively, whereas its other wholesale customers would make no such commitment. Co-ordinating production and sales between two entities that are under separate ownership can be a challenge but we do not know what the counterfactual would have been and whether a separated Openreach might have deployed more or less FTTC than we see today. And by maintaining common ownership in BT, only BTRetail will ever be able to have 'first mover advantage'. We do know that many other firms in other sectors appear able to make large, irreversible capital investments without owning the downstream network which sells the resulting product, and that quite a number of the FTTH networks deployed elsewhere in Europe (e.g. in Sweden and the Netherlands) have been 'wholesale only' businesses which do not operate their own retail operations.

6.4 Problems which arise from transitioning from copper to fibre

It might be argued that BT's reluctance to invest in FTTH is a consequence of its monopoly position and that measures to promote more network competition would be sufficient to resolve this concern. The WIK report for Ofcom on the drivers of superfast broadband investment suggests that more competition from cable (for example, when Virgin Media upgrades to DOCSIS3.1 might prompt BT to revisit its plans. In any event, if competitors were to offer FTTH then a decision by BT not to do so might be much less of a concern[58].

But it is possible that Ofcom will decide not to take measures to promote more network competition or that, even if it does so, its effects will be limited. Some parts of the country may continue to confront a BT network monopoly, in which case the question becomes how Ofcom might incentivise the more rapid transition from copper to fibre under these circumstances.

This involves considering the relative economics of copper and fibre deployment in the UK, since BT's incentives to invest depend upon its appraisal of the returns it might expect to earn from the new assets and those it will enjoy by continuing to rely on copper. As WIK's report notes, some aspects of BT's economics

[58] On the other hand, even if BT does face network competition, Ofcom might still want to take further steps to influence its conduct and accelerate the transition from copper to fibre.

arise from previous decisions or from external factors over which Ofcom is unlikely to have much influence. For example, the geography of the UK and the nature of its housing stock are both likely to influence the relative attractiveness of FTTH and copper, as are demand characteristics of UK consumers and businesses. However, BT's assessment of the relative economics of copper and fibre will also be influenced by the relative returns it can expect to earn from each asset in future, which is something Ofcom, or perhaps the Government, could influence if they wished to. Ofcom currently determines the returns that BT can expect to earn from its copper assets and, in doing so, indirectly influences the returns that it earns from fibre.

To date Ofcom has declined to set the wholesale price which Openreach charges for its FTTC VULA products, arguing that allowing BT greater freedom to determine its own prices should encourage it to invest (at least reduce the risk that intervention by Ofcom deters investment) and that the challenge of setting a price for a product at the early stages of the market's development, when costs and volumes remain uncertain, creates a high risk of regulatory error. This means that, in order to alter BT's incentives, Ofcom would need to revisit the treatment of BT's copper assets. The challenge here is to provide BT with incentives to transition from copper to fibre in a reasonable time period (and faster than is happening in the UK today) whilst at the same time continuing to set pricing signals which promote efficient entry by other network competitors and without enabling competition distorting over-recovery or creating regulatory shocks which deter investment in general[59].

Finally, BT (and all other providers which rely upon BT for wholesale access) face other barriers which inhibit the transition from copper to fibre and which Ofcom should address in this review. These include regulatory obligations which attach to the provision of TDM-based (voice) services delivered over copper but which may be difficult to meet with all IP networks delivered over FTTH. This includes the provision of access to emergency services during power outages, CLI, and support for telemetry and other services. There are also obvious practical challenges associated with dealing with consumers who may not wish to see their copper telephone line replaced. The SRDC makes passing reference to these issues but does not give them much prominence[60]. This is in stark contrast with the current situation in the United States (and France), where preparations for the transition from copper to fibre are already well advanced and are seen as one of the most important issues for regulators in those countries.

6.5 Summary of problems with today's UK fixed communications markets and their underlying causes

If one relates the concerns or problems with the performance of the fixed communications market in the UK to the underlying causes discussed in the previous section it is useful to distinguish between causes that appear to reflect a deliberate policy choice made by Ofcom in the past (and so would require a change in policy to address them), those that appear to be unintended consequences of the application of existing regulatory arrangements which require changes in the regulation rather than the policy itself) and those which arise from the ineffective application of existing regulation which may simply require additional

[59] The WIK report finds that there is little evidence that regulatory policy in matters such as pricing has, to date, had much influence over FTTH deployment one way or the other, and that other factors are far more significant. However this may simply result from the fact that no particularly significant interventions into the returns available on copper assets have been taken by regulators so far.

[60] At para 4.77

measures to improve effectiveness or which are currently ineffective as a direct result of the existing policy choice. Some of problems result from all three of these phenomena whilst others do not.

In the majority of cases, the problem that has been identified is the product of deliberate policy choices made by Ofcom in earlier reviews. This means that it is capable of being addressed, at least in part, by making different policy choices. The examples of problems arising from the ineffective application of existing regulation are much fewer, which suggests that Ofcom faces questions about changing the paradigm rather than simply applying the existing paradigm more effectively. What comes out most clearly is that if Ofcom wants the performance of the UK market to change in a material way, it has to be prepared to be bold.

Problem	Causes		
	'Policy choice'	'Unintended consequences'	'Ineffective regulation'
Openreach has performed poorly in supplying current ULL and FTTC products	Lack of competition to Openreach means customers have no alternative suppliers and Openreach does not lose profits from underinvestment The impact of Openreach underperformance on theUK retail market is significant because all players (except Virgin) rely upon Openreach inputs	Current regulation of Openreach incentivises BT management to allocate resources to non-regulated businesses where BT can differentiate more effectively Poor performance by Openreach may be non—discriminatory in intent, but nonetheless has disproportionate impact on rivals compared to BT's own retail business	Lack of alternative benchmarks make choosing appropriate regulatory benchmarks for QoS difficult making backstop regulation insufficiently challenging to drive real improvements
Lack of innovation and differentiation in Openreach products has inhibited retail competition	Lack of competition to Openreach means all players depend on the same regulated products Lack of effective access to passive network means Openreach can monopolise active product development and lacks wholesale competitors Integration of Openreach means it has no incentive to offer access to passive assets that might enable non-incumbent innovation or competition across more of the value chain	Existing non-discrimination requirements mean rivals cannot differentiate from each other	Current Statement of Requirements process is slow, prevents small improvements and undermines first-mover advantage.

	Integration between Openreach and BT Retail means Openreach has no incentive to develop products which allow rivals to differentiate from BT or cannibalise existing BT Retail revenues		
Discrimination by Openreach has inhibited retail competition		Poor performance by Openreach may be non-discriminatory, but nonetheless has disproportionate impact on rivals compared to BT's own retail business	Existing regulation of Openreach still allows it to discriminate and avoid detection and/or fails to deter such conduct. Lack of alternative benchmarks make detecting discrimination more difficult.
Openreach is not investing in FTTH and the UK underperforms in fibre deployment as a result	Lack of competition means Openreach has no incentive to upgrade to FTTH as a result of limited non-incumbent FTTH deployment Vertical integration of Openreach inhibits access to ducts and other passive assets that might otherwise enable non-incumbent FTTH deployment Returns from existing copper assets make transition to FTTH unattractive to BT UK State Aid programme has extended FTTC but not FTTH deployment	Current regulation and availability of VULA reduces incentives of BT's rivals to build own network Current regulation leads BT to divert capital to unregulated BT retail activities and away from Openreach	Current regulatory regime overcompensates Openreach for past copper investments further undermining its case for FTTH roll out.

Vodafone believes Ofcom should take a number of steps to address the problems identified in the previous section. We consider measures to address each of the three core concerns which we identified in the previous section.

6.6 Measures to address problems arising from BT's access network monopoly

The previous section reveals that a lack of network competition is a root cause of three of the four key problems in the table above which we identify in the UK fixed communications market today and could be expected to at least improve the position on the fourth (discrimination) by making CPs less dependent upon Openreach. Realising more network competition could therefore have a transformative effect on the

performance of the UK fixed market. In this section we consider the measures Ofcom might take to achieve this (and what measures it might otherwise take if the competitive landscape were to remain unchanged).

Ofcom's challenge, in common with all regulators, is that it cannot know today whether, how far, or fast network competition might extend in the UK in the future. In the last review Ofcom concluded that the access network was likely to remain an enduring bottleneck and designed a regulatory architecture based on that premise. Since then developments elsewhere in Europe, suggest that the possibilities for access network competition are considerably more encouraging than Ofcom had supposed[61]. However, we cannot know how much access network competition might have developed in the UK over the past decade had Ofcom pursued a different policy in 2005. Nor can know how much access network competition will arise in future if Ofcom were to change its policy approach now. On the flip-side, unless Ofcom puts in place the regime necessary for it to emerge, the 'self-fulfilling prophecy' of insufficient alternative investment to fundamentally change the market will continue.

We think that one of the important conclusions which WIK draw from their study of recent developments is that access competition, particularly from FTTH providers, does not arise from the regulator taking a 'technology' neutral stance. FTTH competition develops if regulators or Governments take a positive decision to promote it. Ofcom has in the past sought to present itself as being 'neutral' on the question of how the UK market should evolve, arguing that its role is to set appropriate pricing signals and allow firms to invest as they see fit. The reality is that Ofcom (like all regulators) has historically taken policy decisions on issues such as the relative merits of network competition and resale based competition (where it has used copper pricing regulation to aggressively promote unbundling of BT exchanges over resale). In a similar vein, Ofcom could, now, take a deliberate policy decision to promote non-incumbent fixed network deployment in the UK, and thereby promote the greater deployment of FTTH than current arrangements are likely to deliver. Technology neutrality appears to be a stance to avoid intervention.

In the SRDC, Ofcom refers to the possibility of promoting 'end to end' network competition under which entrants would build completely independent networks without any reliance whatsoever upon inputs from BT, as the cable operators did in the in UK in the 1980s (and as Virgin proposes to do today in extending that network by another 4m households). We think it is difficult to make a general case for duplicating BT's existing duct and pole infrastructure, at least in urban areas which represent the majority of the market, given the low innovation gains and very high costs that this would involve. We also have some difficulty envisaging what measures Ofcom would take to further promote end to end competition at this stage (although some may argue that promoting passive access measures will undermine it), other than perhaps encouraging owners of passive assets outside of the communications sector to make them available to telecommunications operators (but it is not clear to us why intervention by Ofcom is required to achieve this nor what form it would take).

Instead we focus on measures to promote competition based upon access to Openreach's passive assets. These involve:

[61] Ofcom accept this in para 9.33

a. Improving the existing Passive Infrastructure Access products and industrialising the processes used by Openreach to deliver them. This would include removing current restrictions on how the assets are used, revisiting the pricing of products, developing on-line resources to allow customers to understand the availability and capability of Openreach's passive assets and to order products. New arrangements would also need to be introduced for the conduct and delivery of surveys.

b. Determining what happens when it is not feasible for Openreach to provide duct access for technical or other reasons. This might involve the provision of dark fibre already deployed by Openreach. However, the efficacy of this remedy is likely to be limited given that Openreach has not deployed fibre beyond the cabinet to many premises in the UK, which excludes dark or 'unbundled' fibre as a solution for non-incumbent FTTH deployment in the UK. BT sometimes seeks to use past underinvestment into its duct infrastructure as the *coup de grace* which means passive infrastructure access cannot work now. We reject this view. Instead, Vodafone believes this simply means that arrangements also need to made for Openreach to make additional investments to upgrade the duct infrastructure so that it can accommodate the needs of its customers. We explain below that there are various models which might achieve this (although we recognise that there are details to be discussed).

c. Ensuring equivalence of input for BT's downstream businesses by requiring the rest of Openreach to obtain access to the passive assets using the same processes and products as would be developed to support BT's rivals. This would apply whether Openreach deploys FTTH or G.Fast and is particularly important if Openreach remains a vertically integrated entity.

More extensive and more effective access to BT's passive assets would allow BT's competitors to install their own fibre and install their own active equipment, opening up opportunities for greater downstream innovation in the retail market and, potentially, competition to BT Wholesale and parts of Openreach as well (many non-incumbent FTTH network providers wholesale active services in this way).

Implementing these measures could take several forms, some of which are more ambitious (but may also be more effective, costly or time consuming) than others. Although what follows is not intended to be exhaustive, we see the options as being broadly:

Extending the existing regulatory architecture so that Openreach would be subject to new behavioural rules, similar to those that already apply in relation to the supply of ULL, VULA, or other products, which would require it to offer passive access on demand at regulated prices and on regulated terms.

In addition to (a), Ofcom might introduce targets which would require Openreach to invest in upgrading its existing duct infrastructure so as to ensure that it is in an adequate condition to fulfil Ofcom's competition objectives. The prices which Openreach could charge customers would need to be adjusted by Ofcom to reflect the costs of such additional investments, or Ofcom might link prices directly to the fulfilment of certain performance targets.

One of the key uncertainties at this stage relates to the capabilities of BT's duct infrastructure and its capacity to support network competitors as well as BT itself. We note that Openreach's integrated structure provides it with obvious incentives to understate the capability of its duct infrastructure to Ofcom and to rivals.

A part of Openreach (Openreach AssetCo) itself could be subject to a new separation at the passive level in order to address concerns that Openreach might otherwise have incentives to frustrate competition in order to (a) protect downstream profits earned from VULA, Wholesale and Retail and (b) protect profits from its copper assets which would be threatened by competitive FTTH deployment enabled by passive access. Under this option, Openreach would be separated into an 'Asset Co' or 'Duct Co' holding ducts and poles and a 'Net Co' which would retain the remaining Openreach assets (fibre, copper and actives) but remain subject to common ownership by BT. 'Asset Co' would then be subject a set of regulatory obligations appropriate to the monopoly provider of an essential input.

Openreach could be subject to **full structural separation**, with the Asset Co being subject to separate ownership, independent of BT. Note that this is quite different from the 'structural separation' which is often proposed and which we discuss further below which assumes that Openreach retains all of the network assets it currently manages when it is separated from the rest of BT. In this current case, Openreach would itself be sub-divided, with the duct and poles assets being held separately from the rest. Ofcom note that one of the concerns with structural separation is that the boundary between what are 'bottleneck' and what are 'competitive' assets may change over time, but that it is difficult to move assets between separated firms after the event. This is less of a concern here, where the boundary between ducts and poles and the rest of Openreach is much easier to specify and much more likely to remain stable over time. The separation of ducts from the rest of the network was a feature of the 'Asset Co'/'Net Co' model adopted in Singapore and which is described by both Analysys Mason and WIK in their reports for Ofcom.

Although Asset Co would be held and controlled by non-BT interests, it would still remain a monopoly provider of passive inputs and so would be likely to be subject to regulation to address the concerns that are normally associated with monopoly (exploitative pricing, poor quality and potentially underinvestment). The regulatory regime for a non-BT Asset Co would, however, avoid the regulatory interventions which are otherwise required to address concerns arising from vertical integration (notably discrimination). Some ownership arrangements (such as ownership by its downstream customers but no control by any one of them) might also allow for less intrusive regulation of Asset Co than others.

If 'Asset Co' were a separate entity, **other measures might also be considered to improve the quality of the assets and thereby further enable network competition over the platform**. For example, the European Commission has increasingly focussed on the role of non-telecoms passive assets in enabling ultrafast broadband deployment. Vodafone is currently involved in rolling out a rural FTTH network to a first phase of 500k households in Ireland based upon the assets of the Electricity Board.[62] 'Asset Co' could become a focal point for the aggregation of such assets in the future. Similarly, a separate Asset Co could replace BT as the primary recipient of public subsidies intended to promote the deployment of competitive FTTH infrastructure in the UK. This would begin to address the concern, noted briefly earlier, that the existing UK landscape means that the Government has little option, and will have little option in future, but to direct public subsidy at BT if it wishes to promote FTTH in the UK. 'Asset Co' might provide the Government with a better, more competitive, alternative for any future subsidy programme.

[62] www.siro.ie/more_about_siro/

More work is clearly required if Ofcom were to pursue the more radical versions of the Asset Co model we present above. For example, in order to effectively address concerns about vertical integration, it is clear that no downstream firm should enjoy a controlling interest in the upstream company. On the other hand, there may also be significant benefits from having participation by a number of competing downstream providers in the management and ownership of Asset Co itself. [63] Consideration would also be need to be given as to how Asset Co would come into being. The most obvious options appear to be either the imposition of such a structure upon BT by the regulator, following a reference to the CMA, or the voluntary divestiture of assets by BT, perhaps in response to the application of other regulatory incentives discussed in this section.

The measures described above would require Ofcom to extend regulation into some areas (notably passive access) where it has not ventured in the past but to deregulate in others. For example, it may be desirable but also necessary for Ofcom to withdraw regulations which might otherwise discourage potential entrants from exploiting the opportunities which Asset Co presents.

Such an exercise in realigning non-incumbent incentives would be similar to that which was undertaken, successfully, by Ofcom to induce investment in DSL platforms 10 years ago. In that case, regulation was withdrawn from the pricing of resale and bitstream products supplied by Openreach and BT Wholesale whilst the price of ULL was cut sharply.

There are three fundamental challenges here: timing, scope and the impact on wholesale access prices. What is required is credible commitment on the part of both sides – regulator and potential entrant – about what will happen in future. The commitment by the regulator to reduce downstream regulation needs to be credible to induce investment by the firms, and the commitment by the firms needs to be credible if the regulator is to withdraw. At the same time, Ofcom needs to ensure that the incumbent is not the overwhelming beneficiary of such a move by over-recovering on sunk assets while alternative operators seek to build.[64] Ofcom may therefore need to consider means by which it can both obtain and provide such commitments if it pursues some of the measures outlined above. One way of squaring this circle, described further below, is to expressly treat fibre and copper investments differently, reducing the returns available on copper by diverting part of the price to fibre or passive investment. This incentivises future-proof build, prevents competitive distortions which arise from the over-recovery on sunk copper assets while still maintaining wholesale prices at a level which enables alternative fibre deployment. We call this the 'copper wedge'.

Even if non-incumbent operators are able and willing to build competing networks after securing access to passive assets, there will be geographic limits to their ability to do so. In areas where competitive network deployment is not feasible Ofcom will need to ensure that Openreach remains obliged to offer products such as VULA in order to sustain the existing competitive model. But neither the non-operators nor Ofcom will be able to predict the eventual geographic scope of network competition from the outset. Ofcom will

[63] BT's Regulatory Statements suggest the duct assets held by Openreach have a value of a little over £4bn. Assuming BT retained an interest of at least 25% but was prepared or obliged to sell the rest, others (which might include BT's rivals, financial investors and/or the Government) would need to find funds of the order of £3bn.

[64] The Frontier Economics reports at Annex 2 demosntrates the very real ability of BT to over-recover in regulated markets in spite of detailed, specific regulation.

therefore need to either find some way to allow non-incumbent operators to reveal their commitments to build over time, perhaps by tying any further investments that are made to upgrade BT's passive infrastructure in a particular geographic area to the longer term withdrawal of obligations to supply VULA or similar products in that same area or roll back regulation only where and when alternative networks arrive.

If Ofcom declines to adopt any of the measures presented above, or if they do not produce network competition in some areas, Ofcom could consider taking other steps to improve the performance of Openreach as a monopoly provider of network inputs. For example, to the extent that Openreach's monopoly position leads to concerns about underinvestment, either in terms of inadequate coverage, technology evolution or quality of service, Ofcom could set new performance targets for BT's management on these or indeed other aspects of Openreach's performance (including targets for FTTH deployment), similar to the way in which Ministers set targets for BT prior to privatisation in the 1980s. Or it could go even further and directly intervene in the management and structure of Openreach. For example, some observers believe that Openreach's poor performance arises because of its centralised structure, under which managers have responsibility for individual performance targets but not for end to end delivery. Ofcom might propose that Openreach be restructured on a more regional basis, enabling greater focus and accountability and creating the possibility of 'yardstick regulation' under which Ofcom would compare the performance of different regions to raise the standards of all.

These or other steps would involve Ofcom intervening much more directly in the detailed operational performance of Openreach, overseeing inputs as well as outputs. We doubt Ofcom will find this attractive but the Government might; particularly if this form of regulation were limited to Openreach in rural areas and those requiring direct Government subsidy. However, favouring structural rather than ongoing enforcement remedies we turn now to address the problems that arise from vertical integration (which include incentives to underinvest) and from the current regulation of copper (which may deter investment in FTTH).

6.7 Measures to address vertical integration

The primary aim of the previous Strategic Review was to address concerns about BT's vertical integration and resulted in the 'operational' or 'functional' separation of BT. Today, Ofcom have two choices: to retain but modify the existing 'functional separation' architecture in the hope of improving its effectiveness (or ensuring that it remains effective in the face of other developments) or to move instead to some form of structural separation between the Openreach network and the rest of BT.

Ofcom make a number of proposals about how it might modify the existing Openreach architecture to make it more effective. These include:

a. Adjusting the boundary between Openreach and the rest of BT as some products become competitive and as BT's network architecture changes. This appears sensible and likely required if the existing arrangements are maintained, but it is not clear that it would fundamentally address all the concerns about vertical integration which we presented earlier.

b. Considering alternative governance arrangements aimed at further weakening the influence which BT Group management might exercise over the conduct of Openreach. Ofcom point to examples from Singapore and Scottish Water, but do not advance any specific proposals for BT. We remain open to any

such moves, including the legal separation of Openreach with a separate board and fiduciary duties owed by its directors to Openreach alone. However, it seems to us difficult to devise governance arrangements for Openreach which would significantly extend its operational or financial independence from the rest of BT if BT still makes the key financial capital allocation decisions and takes ultimate responsibility for Openreach's liabilities. Openreach's management are already subject to separate incentive arrangements and have significant autonomy over the allocation of capital (within an overall envelope agreed with the BT Board).

c. Stronger enforcement powers, notably the power to impose fines on Openreach/BT (or perhaps on individuals) in respect of breaches of SMP regulations or the Undertakings. This is an obvious measure to address concerns that Openreach is engaged in the deliberate contravention of existing rules (or that it is simply careless in their implementation). However such behavioural remedies will always be a 'second best' subject to information asymmetries and gaming which enable infractions to go undetected and undeterred. The bigger issue appears to be the absence of rules which provide appropriate incentives in the first place.

Quite simply, Vodafone does not believe that any of the incremental adjustments proposed by Ofcom in the SRDC would be sufficient to meet the concerns arising from vertical integration that is so apparent in section 5 of this document. Ofcom could also add additional output targets for Openreach, such as additional quality of service standards (or explicitly relate regulated prices to the achievement of certain targets, as occurs in other utility sectors) in an effort to supplement or improve what is already there. Overall, however, it is difficult to avoid the conclusion that the current model has been pushed about as far as it can go. If Ofcom require a step change in Openreach's performance, then more radical action is required.

We have already discussed a model of separation between the duct and other passive assets and the rest of Openreach/BT when considering measures which might promote network competition in the UK. However, a separation could also be made, or could instead be made, between Openreach and the remainder of BT's retail and global businesses. We refer to this as an Openreach/Retail separation. There are several benefits of this model:

a. A legally separate Openreach would have no incentive to favour any particular downstream provider over any other, eliminating concerns about discrimination both in relation to the provision of existing and the development of new products and in relation to any benefits BT Retail currently derives from the poor performance of Openreach.

b. A legally separate Openreach would be able to raise capital on its own account and would not rely upon capital allocation decisions of a parent. Nor would profits it earns be redirected to other businesses. Whether or not this resulted in more FTTH deployment, or better service delivery is likely to depend upon the ownership of the separated company. If it were jointly owned by the downstream customers, then they might be expected to have strong incentives to ensure that performance improved. If the owners had no such downstream interests, the impact on performance may be less clear.

c. Separation would also allow Ofcom to **dismantle much of the regulation which it applies today** to address problems arising from BT's current integrated structure. Of course, a separated network monopoly would remain a monopoly, and so Ofcom would also need to consider how that entity would be regulated. It seems likely that Ofcom would continue to regulate the prices charged by the network to its downstream customers in order to prevent exploitative behaviour, but this might depend on the ownership structure of the separated Openreach[65].

d. **Openreach/Retail separation might improve the prospects of non-incumbent FTTH build** (and so could be viewed as complementary to measures to promote competition discussed above.) This is because BT's remaining retail businesses would no longer be obliged to purchase network inputs only from Openreach. Given that BT Retail currently serves a very significant proportion of the superfast broadband customers who might be expected to migrate to FTTH in future, the ability of non-BT network providers to win BT Retail as a wholesale customer would be an important consideration in any non-incumbent FTTH investment case and an Openreach/Retail separation would mean that this was now conceivable.

These are all potentially significant achievements, but there are clearly also limits to what an Openreach/Retail separation would achieve. It would change the ownership of the access network monopoly but would only lead to a significant improvement in the performance of Openreach if it was structured so that it felt the pressure from all its customers and it would not directly lead to a more aggressive FTTH deployment in the UK without other regulatory incentives. It is true that such an Openreach would be simpler, more transparent and arguably easier to manage and finance than it is today. Nonetheless, whoever owns it, a separated Openreach would still own a valuable copper portfolio and so would face many of the same incentives.

6.8 Measures to promote the transition from copper to fibre in the UK

In previous sections we have explained that competition from rival FTTH networks based upon passive access (or from DOCSIS 3.1) offers the best prospect of pushing BT to deploy FTTH more extensively in the UK. Structural separation between Openreach and Retail may also help. These remain the measures which we think Ofcom should focus on at this stage.

However, it is also important to consider briefly what Ofcom might do if it decides not to promote more network competition, or if such efforts fail to yield results. In the absence of competition, the incentives of

[65] It is also possible to imagine other arrangements under which the new owners of Openreach agree with Ofcom, or with the Government, a set of performance metrics and/or a strategic plan which would ensure that the broader requirements of the UK market would be fulfilled by the new company (such governance arrangements have been developed in other industries, notably rail (where Network Rail is required to define broad strategic goals in conjunction with the Government, energy and aviation)). This might be particularly relevant if the Government itself were to become a shareholder in the company, perhaps in return for the provision of public funds directed to the achievement of certain objectives. How much, and what form of, regulation would be required for a separated Openreach would depend on a range of factors, including the composition of the shareholders and other governance arrangements. Again, these will require further elaboration as the debate proceeds, but Oxera's report (for Vodafone) on 'co-investment' is a good starting point, see http://www.oxera.com/Oxera/media/Oxera/downloads/reports/Oxera-NetCo-report.pdf?ext=.pdf

Openreach (whoever owns it) to move from copper to fibre will be significantly influenced by the regulatory treatment of the returns which BT (or any subsequent owner) might expect to earn from the copper assets.

Current pricing arrangements are intended to ensure that BT currently recovers the historic cost (including an adjustment or indexation) of its copper assets. Vodafone has long argued and Ofcom now accepts that Openreach over-recovers on its past investment via regulated charges and thereby earns excess profits as a result.

Simply reducing the copper prices Openreach can levy may prevent the current competitive distortion created by this over-recovery but is unlikely to help the UK move to a multi-operator investment model. Openreach will have even less incentive to replace copper and its performance is likely to further deteriorate as a result. The investment case for FTTH will also be undermined, to the extent that copper prices constrain what BT could charge for FTTH in the retail market. BT's rivals will enjoy lower input costs, but only provided that they continue to rely upon the copper assets as well.

Ofcom therefore appears squeezed between the need to set a copper price which prevents current over-recovery, incentivises efficient network investment by BT's rivals and a price which might more properly incentivise BT to accelerate the transition to fibre. We recognise that the problem might not arise, or might not arise so acutely, if the higher costs faced by an investor in FTTH (whether BT or rival) were fully reflected in a much higher willingness to pay for FTTH on the part of today's UK consumers. But the market for FTTH in the UK is immature and some kind of intervention will be required if Ofcom wishes to accelerate adoption.

One way to do this would involve inserting a 'wedge' between the copper price paid by BT's rivals and the receipts which Openreach would actually obtain from those sales. Retail and wholesale prices would remain unchanged[66], but BT's incentives to replace its existing copper with more copper would be weakened if it could no longer recover fully the cost of new investments in copper and/or a 'glide path' were introduced to reduce over time the returns available to BT on existing copper investments with a more generous pricing regime for fibre investment. However, Vodafone would be very concerned if such an approach were to be adopted in the absence of structural separation as this could simply exacerbate the existing problem of Openreach over-recovery on SMP wholesale products cross-subsidising BT entry into adjacent markets.

Ofcom would need to consider what to do with the receipts which were generated. Proposals to use 'taxes', broadly defined, to fund broadband objectives is not unprecedented in the UK: a former Ofcom CEO, Lord Carter, proposed a 'broadband tax' in 2009, the receipts of which were to be used to subsidise FTTC deployment. Ofcom could require BT to reinvest any receipts into upgrading its passive infrastructure in order to better fulfil Ofcom's other competition objectives. Or it could allow Openreach to access them provided they were applied to fund FTTH deployment.

Other measures could also be considered and may be required for the transition to work (either instead of but more likely in conjunction with the 'wedge'). For example, the Government could offer BT a 'put option' for its copper assets, allowing it to sell them to the Government at some predetermined price at some

[66] The existing margin squeeze test would take the price charged by BT as the relevant input cost, not the revenue received by BT.

predetermined point in the future. The Government would not take physical control of the assets, but the exercise of the put would trigger an obligation on the part of BT to take the steps necessary to decommission the assets within a given timeframe. BT could decline to exercise the put, in which case it could seek to extract value from the copper under the continued operation of the 'wedge' arrangements, perhaps with a view to retiring them at some later date which it would determine for itself. Whether it would do so might depend upon the extent of competition it anticipated from rival FTTH networks or cable, which may in turn depend on its assessment of the likely effectiveness of other measures which Ofcom may take to promote competition.

In the extreme, Ofcom/Government could simply seek to direct BT to decommission the copper network by a certain date, but we expect that this would be very unattractive, assuming that one could establish a legal basis for such a step. We think Ofcom will (and should) prefer making adjustments to the economic incentives which BT currently faces, with such adjustments being intended to strengthen BT's interest in accelerating the adoption of FTTH technologies in its own network. A wedge which makes it less attractive for BT to replace copper with copper or continue to over-recover on sunk assets which no longer represent the modern equivalent asset (whilst still allowing Openreach to meet acceptable investment and quality of service targets during the switchover process) seems to us one measure which could achieve this and which therefore merits examination.

6.9 Aligning the solutions with the problems

To recap, most of the problems identified have several underlying causes, which means several remedies will be required to address them adequately. Some of the remedies are complementary, but others are mutually exclusive and involve different elements of risk, cost and likely effectiveness (inevitably, these factors are often negatively correlated). Where appropriate, we suggest different remedy 'packages' (1 to 3) which reflect different approaches to resolving the problem. The efficacy of the remedie increases with each package, for instance remedy 1 is very incremental, which Remedies 3 are more interventionist but would deliver longer lasting solutions.

Problem	Remedy 1: no change in policy but improve effectiveness of existing approach	Remedy 2: some changes in policy and approach	Remedy 3a: fundamental changes in policy and approach	Remedy 3b: fundamental change in policy and approach
Openreach has performed poorly in delivering current ULL and FTTC products	Apply new performance targets to Openreach (either directly or linked to regulated prices) Enable Ofcom to impose fines for non-performance by Openreach		Structural separation of Asset Co from rest of Openreach/BT to promote competition and reduce dependency on Openreach	Intervene to restructure Openreach (e.g. into regional operations) or set investment requirements

			Structural separation of Openreach from rest of BT to ensure BT Retail can buy from non-BT network providers	
Lack of innovation and differentiation in Openreach products has inhibited retail competition	Consider changes to existing non-discrimination rules to facilitate greater differentiation		Structural separation of Asset Co from rest of Openreach/BT to promote competition in wholesale market	
Discrimination by Openreach has inhibited retail competition	Enable Ofcom to impose fines for non-performance by Openreach New governance arrangements?	Structural separation of Openreach from rest of BT	Measures to Promote network competition and reduce dependency on BT, including structural separation of Asset Co from rest of Openreach/BT	
Openreach is not investing in FTTH and the UK underperforms in fibre as a result	Revise existing PIA arrangements (and possibly dark fibre) and industrialise process to improve the existing Openreach passive access offer	Functional separation of Openreach into Asset Co and rest of Openreach BT required by Ofcom to invest to improve capacity of Asset Co to support competition Ofcom commit to withdrawal of VULA obligations on BT in future	Structural separation of Asset Co from rest of Openreach/BT to promote competitive FTTH Ofcom commit to withdrawal of VULA obligations on BT in some geographic areas in future Public subsidies targeted at Asset Co to promote competitive FTTH deployment	Wedge introduced to discourage Openreach to replace copper with copper Put option offered to BT to exit copper at predetermined future date

The table above reveals that tackling discrimination by Openreach is in many respects the most straightforward issue and that structural separation of Openreach from BT Retail, although much discussed,

is far from being the most radical policy option. Structural separation aims to better tackle the problems caused by vertical integration, but otherwise accepts many of the policy assumptions made by Ofcom in the previous review[67].

Vodafone has sought to respond to the open-minded and far-ranging SRDC in a similar manner. We described above a range of issues with the current UK fixed access market and we accept that reasonable regulators could choose different policy selections from the above list or choose to introduce them sequentially depending upon the success or failure of prior interventions.

Overall, we think that Ofcom should be seeking to put in place a regulatory regime which will **allow BT's rivals to reduce their dependency on the underperforming Openreach and rely on their own facilities instead in order to improve consumer choice through investment.** This requires:

a. A long term strategy to enable multi-operator investment;
b. Structural or possibly functional separation of Openreach's passive assets
c. A separate approach based upon active wholesale access (possibly from a structurally separate Openreach) in geographic areas where alternative access networks are simply not feasible even with passive access.

[67] For this reason, we present it as a 'package 2' ('some change to policy') rather than a package 3 ('paradigm shift').

Annex 1: Answers to Ofcom Consultation Questions

Should competition policy remain at the core of good availability outcomes for most consumers, complemented by targeted intervention as required?

Q1: Do stakeholders agree that promoting effective and sustainable competition remains an appropriate strategy to deliver efficient investment and widespread availability of services for the majority of consumers, whilst noting the need for complementary public policy action for harder to reach areas across the UK?

Yes, as we set in in Section 3 of this document, promoting choice through competition will create the widespread availability of service which is the best outcome for consumers. Promoting investment to create competition and choice should be a primary objective. Multi-operator investment in competing infrastructures will maximise customer choice, quality of service and innovation.

Q2: Would alternative models deliver better outcomes for consumers in terms of investment, availability and price?

It is clear that the current model of ex ante access regulation plus Functional Separation of Openreach is not creating the environment or incentives for investment in the UK's telecommunications infrastructure. The incremental approach of Fibre to the Cabinet, then Fibre to the Dp does just enough to stifle competitive investment. Maintaining this approach should recognise the reinforcement of the network monopoly and lack of ability for competitive supply and separate this asset from the rest of BT.

What more can be done through public policy to deliver truly widespread availability?

Q3: We are interested in stakeholders' views on the likely future challenges for fixed and mobile service availability. Can a 'good' level of availability for particular services be defined? What options are there for policy makers to do more to extend availability to areas that may otherwise not be commercially viable or take longer to cover?

Availability needs to address both coverage and capacity. In mobile this needs to include the timely availability of spectrum and commercially viable access to property for new masts and backhaul. The mobile industry is building out networks that provide extensive coverage and capacity across the UK in a competitive environment. In fixed, the economics of hard to reach areas suggest that competitive supply is not possible. Rather than allowing another monopoly to be formed, joint venture or other approaches should be used in order to consolidate demand and marketing energy and reduce the ongoing need for regulation.

Does convergence and consolidation in our sectors suggest new approaches or tools are required to deliver effective competition?

Q4: Do different types of convergence and their effect on overall market structures suggest the need for changes in overarching regulatory strategy or specific policies? Are there new competition or wider policy challenges that will emerge as a result? What evidence is available today on such challenges?

As we discuss in section 3 of this document, the leverage of content across a converged bundle of telecommunications products will fundamentally alter the competitive dynamics of the industry. Addressing

this leverage, not only matters to pay TV services, but also to fixed voice and broadband and mobile access. For the longer term sustainability of competition, this must be a priority issue for Ofcom.

Q5: Do you think that current regulatory and competition tools are suitable to address competition concerns in concentrated markets with no single firm dominance? If not, what changes do you think should be considered in this regard and why?

As we discuss in section 3, 5 and 6 of this document, ex-ante regulation cannot alone control the various failings in the market due to dominance.

What model of competition should future regulatory strategy focus on: full end to end networks; passive access to support end to end networks; or active wholesale remedies to deliver downstream competition?

Q6: What do you think is the scope for sustainable end-to-end competition in the provision of fixed communications services? Do you think that the potential for competition to vary by geography will change? What might this imply in terms of available regulatory approaches to deliver effective and sustainable competition in future?

There is a scope for infrastructure based competition in the UK. The current regulatory framework dissuades such investment through a lack of regulatory certainty, poor access to monopoly infrastructure and a lack of vision. To make it viable, a regulatory approach requires more than just a set of access remedies. It need wholehearted support for multi-operator investment together set out in a clear strategy, improved products and with incentives to make those products work.

Q7: Do you think that some form of access regulation is likely to continue to be needed in the future? If so, do you think we should continue to assess the appropriate form on a case by case basis or is it possible to set out a clear strategic preference for a particular approach (for example, a focus on passive remedies)?

Access regulation is required. In the future, mullti-operator investment would aim for long term use of PIA remedies, whereas a monopoly supply of access would look at network remedies. Remedies set in absence of an investment strategy result in no investment strategy.

Q8: Do you agree that full end-to-end infrastructure competition in mobile, where viable, is the best means to secure good consumer outcomes? Would alternatives to our current strategy improve these outcomes, and if so, how?

As we discussed in Chapter 4 of this document, we agree that network based competition remains the way to secure good consumer outcomes.

Are there new or unresolved competition issues in digital communications services?

Q9: In future, might new mobile competition issues arise that could affect consumer outcomes? If so, what are these concerns, and what might give rise to them?

Industry consolidation raises several issues requiring attention. Effective remedies will be required to prevent leverage of market power from fixed to mobile via mobile backhaul, and the benefits of network sharing must not be denied to network operators who depend on them to compete effectively. Spectrum management may also require review in the light of new market structures to guard against market bifurcation.

Q10: Does the bundling of a range of digital communications services, including some which may demonstrate enduring competition problems individually, present new competition challenges? If so, how might these issues be resolved through regulation, and does Ofcom have the necessary tools available?

Bundling of products can provide consumer benefits but those benefits will be short-lived if the effects of monopoly inputs such as content into the bundle cannot be replicated. Analysys Mason predicted that by 2017 nearly half of all broadband consumers will be buying a triple play package. This is not a trivial problem. As we set out in section 3 of this document, addressing the leverage of content into the triple play or quad play bundle could be addressed in one of three ways: limiting the scope of the bundle, creating rigorous Wholesale Must Offer obligations or restructuring audio visual rights auctions in order to promote more contestable content market. Addressing this problem structurally is the right approach, in the meanwhile Wholesale Must Offer obligations are required to ensure the market is not prematurely foreclosed.

Where regulation is required to promote competition, how can it best secure both efficient investment and effective competition during periods of significant investment in risky new assets?

Q11: What might be the most appropriate regulatory approaches to the pricing of wholesale access to new and, risky investments in enduring bottlenecks in future?

As we set out in section 5, Ofcom has taken an overly cautious approach to BT's risk whilst undermining the longevity of CPs investments. However Ofcom's approach to pricing is often subject to risky forecasts: Frontier Economics assessment of BT's RFS suggest that Openreach has over-recovered on Ethernet charges during the last LLCC by approximately £0.5Bn. We understand this is due to a lack of certainty about forecast volumes. So in fact risk is not an issue with products or 'risky' investments, but with the current framework of regulation. A better approach that does not give an asymmetric advantage to BT as a result of regulation, would be to separate BT's heavily regulated business in order to remove the symmetry. Creating the environment for multi-operator investment would reduce the longer term need for regulation and structurally separating Openreach from the rest of BT would limit the impact of over-recovery from investments and prices.

Q12: How might such pricing approaches need to evolve over the longer term? For example, when and how should regulated pricing move from pricing freedom towards more traditional charge controls without undermining incentives for further future investment?

Pricing strategy will need to evolve in line with investment and competitive environments. It is important that triggers are understood and well communicated in advance such that the market can make informed decisions.

Are there changes in competitive outcomes or the overall market context that might suggest the need to update or evolve the current model of fixed access network functional separation?

Q13: Are there any actual or potential sources of discrimination that may undermine effective competition under the current model of functional separation? What is the evidence for such concerns?

Yes as discussed in section 5 of the document, the current framework of access regulation plus Functional Separation addressed the need to offer products on an Equivalence basis. It does not address strategic advantages (such as pan BT decision making on strategy, network investment or topology). It gives the benefits of a benign approach to managing the risk associated with Openreach's investments to downstream BT, rather than distributing them to consumers more broadly. An approach that addressed these structural advantages in order to allow for multi-operator investment is required. This cannot be achieved with Access regulation alone.

Q14: Are there wider concerns relating to good consumer outcomes that may suggest the need for a new regulatory approach to Openreach?

Consumers benefit from choice in the market, choice of service, capability and price. The current fixed market does little to provide choice in any of these areas: quality is non-negotiable, prices are set and the technical capability is constant. A regulatory approach which incentivises investment in order to improve choice is required. As we have previously set out, enabling multi-operator investment will improve choice and outcomes for consumers.

Q15: Are there specific areas of the current Undertakings and functional separation that require amending in light of market developments since 2005?

The Undertakings address the Equivalent use of certain products. As we have set out in section 5 of this document, they have no impact on certain products and capabilities (such as property) and deliberately carve out any application towards strategic decision making: infrastructure investment, network design and topology or addressing whole segments of the market as well as allowing BT to operate in a pan-BT way with Executives sitting on strategic boards such the BT Scotland Board. A new framework must address these strategic issues in order to create the right incentives for investment.

Q16: Could structural separation address any concerns identified more effectively than functional separation? What are the advantages and challenges associated with such an approach?

As previously discussed, Structural separation would address operational and corporate level strategic discrimination. It would allow for risk to be more transparently managed with no downside effect on the market if it was miscalled. It would create a more customer friendly environment as a smaller Openreach would be focused on delivering great customer service and not relying on its parent company for support.

Should Ofcom do more to further support empowerment at each stage of the consumer's decision-making process?

Vodafone believes Ofcom already utilises an effective model for enabling consumer empowerment: Access – Assess and Act. The focus should be upon creating a sustainable market environment that allows competition to thrive and thereby to drive innovation and investment that empowered consumers can navigate to their benefit. By ensuring customers have access to competitive choice of services and that operators are competing on a level playing field, the market will largely self-provide consumer information on competing products to acquire or retain customers.

Where the model fails, then Ofcom should at that point consider whether there is a need for further consumer support. However Vodafone believes that existing work in the wake of the Consumer Rights Directive will adequately provide consumers themselves with the contractual rights to flex their rights and choice within the marketplace.

Q17: What do stakeholders think are the greatest risks to continuing effective consumer engagement and empowerment?

Ofcom must be wary not to succumb to the temptation of stifling market innovation through regulatory incrementalism and micro-management delivered in the name of consumer empowerment. The General Conditions of Entitlement under which all telecommunication companies operate suffer today from regulatory bloat and as a result it is increasingly difficult to ensure accurate interpretation and subsequent compliance. An over-reliance on well-intentioned but reactive consumer measures will exacerbate the situation, adding not just to regulatory burden, but through complexity threatening consumer engagement. Ofcom must look to the intended outcomes of its regulation rather than proscribing ever more granular detail.

Ultimately a failure to tackle regulatory incrementalism threatens to dilute the ability for retail differentiation and therefore choice from the market, as operators are driven to meet the lowest common denominator resulting in increased consumer apathy and disengagement from the market. Where all operators are considered to be the same smooth switching processes become redundant and the virtual cycle of Access – Assess – Act is unlikely to complete.

Q18: What indicators should Ofcom monitor in order to get an early warning of demand-side issues?

Ofcom places great store in consumer complaint figures and switching statistics as an indication of consumer issues. These are undoubtedly of value, but they are entirely a reactive indicator of consumer harm already incurred. Early warning signs of current demand side issues have with hindsight manifested through the work of the OTA. Poor quality of service delivery within Openreach's copper and fibre products and continual failure to meet service levels has long been apparent through industry KPIs. Equivalence obligations in the Undertakings were insufficient to deliver a change in Openreach behaviour and to tackle the underlying issues and have required action through specific and detailed QoS directions and SMP Conditions; not before numerous consumer complaints had been generated. Individual operators undoubtedly could have handled some of these instances more effectively, but ultimately consumers demand working services at their convenience and the key building blocks are routinely not being delivered by Openreach.

Ofcom already has measures in place to identify these problems but it needs to recognise earlier that failure by Openreach to meet SLAs is not simply a question of inter-industry service levels or a symptom of incorrectly calibrated targets, but rather reflective of the consumer experience. Admittedly the reality of poor service was obfuscated by 'stop the clock' on Ethernet services.

Q19: What options might be considered to address concerns about consumer empowerment at each stage of the decision-making process (access, assess, act)? What more might be required in terms of information provision, switching and measures to help consumers assess the information available to them? What role may Ofcom have to play compared to other stakeholders (including industry)?

We refer Ofcom to our comments above in relation to this question. Retail consumer offering competition drives the ability of operators to compete and this competition provides the impetus for empowered consumers to assess different offerings and to act upon their decision making. As set out in section 3 Ofcom should intervene to address risks associated with leveraging the control of exclusive content into access markets; asymmetry of switching capability across bundled services and an increasing concentration of the retail fibre market;

What more should Ofcom do to support better quality of service for consumers, in either competitive or less competitive markets?

Q20: Are there examples in competitive or uncompetitive sections of the market where providers are not currently delivering adequate quality of services to consumers? What might be causing such outcomes?

Openreach's delivery of Ethernet and copper based services is poor. Ofcom has been required to put in place detailed QoS obligations. Openreach's response to the BCMR, suggest it will struggle to deliver on these obligations in year 1 (which are not onerous). A lack of customer focus, a lack of competition and a complacent attitude to investment have contributed to Openreach's an environment where meeting artificially low KPIs is more important that delivering customer satisfaction.

Q21: What further options, if any, should Ofcom consider to secure better quality of service in the digital communications sectors?

Competition can deliver improved quality of service. In its absence detailed regulation is required to address this area of market failure.

Are there opportunities for deregulation or simplification that will bring broader benefits whilst avoiding new risks to consumer harm?

Q22: Might there be future opportunities to narrow the focus of ex ante economic regulation whilst still protecting consumers against poorer outcomes?

Increasing competitive intensity will reduce the overall need for economic regulation, reducing regulation should not be a primary goal but a useful secondary benefit from competition.

Q23: Where might future network evolutions, including network retirement, offer opportunities for deregulation whilst still supporting good consumer outcomes?

As previously discussed, removing inappropriate or outmoded regulation is to be welcomed, but larger scale withdrawal of regulation requires competition to minimise its purpose.

Q24: What are the potential competition and consumer protection implications of the rise of OTT services? Might the adoption of such services enable future deregulation without raising the risk of consumer harm?

OTT services often compete with open network services, however are subject to different and often reduced consumer protection regulation. Appropriate harmonisation of regulation should be the goal in order to mitigate consumer harm or misunderstanding.

Q25: Are there any areas where you think that regulation could be better targeted or removed in future? What would be the benefit of deregulation as well as the main risks to consumers and how these could be mitigated? Please provide evidence to support your proposals.

A detailed review of the General Conditions is required to assess it role and purpose .Incremental and piecemeal regulation have created complexity and compliance costs. Technology neutral switching capability is required across the industry, not just for those services provided on the Openreach network.