

Consultation on adding dark fibre to the remedies for business connectivity markets

Comments on proposed remedies

31 January 2018

1 Background

As a result of the Competition Appeal Tribunal's judgment¹ that struck down Ofcom's market definition in the 2016 BCMR Statement², Ofcom has set certain temporary SMP conditions on BT in respect of leased line services³ and at the same time launched a consultation⁴ on imposing a requirement to provide dark fibre.

In the 2016 BCMR Statement, Ofcom defined a single product market for leased lines using "Contemporary Interfaces" (so-called CISBO services) regardless of bandwidth (not splitting the market by bandwidth, as it had done in the previous BCMR in 2013). The CAT's judgment found that Ofcom had erred in its decision.

The temporary SMP conditions are imposed in respect of "Lower Bandwidth" CISBO services at and below 1Gb/s, excluding the Central London Area (CLA) and central business districts (CBDs) in Birmingham, Glasgow and Leeds. These measures have been imposed through Ofcom's exceptional powers without consultation.

In parallel with its Statement setting out these SMP conditions, Ofcom has issued a Consultation on a revised dark fibre access (DFA) remedy. In the 2016 BCMR, Ofcom proposed DFA based on an

¹ [2017] CAT 25, 10 November 2017

² Ofcom, Business Connectivity Market Review – Final Statement, 28 April 2016, <https://www.ofcom.org.uk/consultations-and-statements/category-1/business-connectivity-market-review-2016>

³ Ofcom, Business Connectivity Markets: Temporary SMP conditions in relation to business connectivity services, 23 November 2017, https://www.ofcom.org.uk/__data/assets/pdf_file/0019/108019/BCMR-Temporary-Conditions.pdf

⁴ Ofcom, Dark Fibre Consultation: Consultation on adding dark fibre to the remedies for business connectivity markets, 23 November 2017, https://www.ofcom.org.uk/__data/assets/pdf_file/0014/108032/Dark-Fibre-Consultation.pdf

“active minus” pricing approach, where a 1Gb/s active service was taken as a reference product and various adjustments applied to yield the dark fibre access price, the most significant of which was to subtract the cost of terminal electronics attached at the ends of the optical fibre used in providing an active service.

The 2016 BCMR decision was appealed by TalkTalk, leading to the CMA making a Determination that modified Ofcom’s original methodology for dark fibre pricing. This modification was intended to offset a distortion in the non-domestic rating system. Most CPs pay non-domestic rates (NDRs) on lighting each dark fibre, whereas BT (and Virgin Media) pay on a “cumulo” basis related to its entire base of relevant fibre assets; the effect was that there was a differential (the ‘NDR differential’) in the average rates per fibre. The CMA’s Determination resulted in a significant reduction in the DFA price relative to that originally proposed in the BCMR statement, in effect requiring BT to absorb the NDR differential.

The current consultation proposes a DFA remedy with a superficially similar pricing rule, in that the access would be set by reference to the price of 1Gb/s active service, with the adjustment for the NDR differential required by the CMA’s ruling. The original remedy proposed in the 2016 BCMR allowed CPs to use DFA to deploy any service they chose. However, it is now proposed that BT would be able to limit the use of DFA contractually to allow only services at 1Gb/s or below. The other change is that the geographical availability of DFA is somewhat reduced due to the exclusion of CBDs in Birmingham, Glasgow and Leeds.

2 Current proposals and the 2016 BCMR’s case for DFA

We start by making some high-level comments about the relationship between the proposed DFA remedy – especially the usage restriction – and the previous DFA proposals in the 2016 BCMR.

Changes affecting Ofcom’s case for DFA and lack of re-evaluation

The proposed DFA remedy with a limitation on the services that can be provided in line with the revised product market definition fundamentally changes the nature of the costs and benefits of DFA. Therefore – perhaps unsurprisingly – Ofcom’s previous arguments for imposing DFA made in the 2016 BCMR do not apply unmodified.

Furthermore, the balance of costs and benefits arising from DFA depends on the regulated access price. Therefore, in addition to this radical change in the remedy resulting from the changed market definition, there is a need to consider whether Ofcom’s case for DFA as made in the 2016 BCMR is modified by lowering the price of dark

fibre following the CMA's Determination regarding the NDR differential.

Despite these rather fundamental changes, Ofcom's current Consultation relies to a large extent on the analysis Ofcom put forward in the 2016 BCMR Statement. This analysis has not been significantly modified despite Ofcom dropping the Statement's finding of SMP in active services above 1Gb/s in response to the CAT's judgment. This lack of re-examination is problematic given that market definition and consequent SMP findings must form the starting point for identification of a remedy proportionate to whatever competition problem has been found.

We consider that the cost benefit analysis of DFA set out in the 2016 BCMR Statement is subject to material errors. These remain relevant given that Ofcom's case for DFA in the Consultation remains largely unchanged (as discussed in Section 3 below). The problems with Ofcom's analysis in the BCMR have already been set out in a series of Expert Reports provided to the CAT in the course of BT's recent appeal and so are already available to Ofcom.

Ofcom's claim that the case for DFA is now stronger

Ofcom makes a very strong claim in the Consultation: that its case for imposing DFA is now even stronger than its case for DFA made in the 2016 BCMR. Ofcom advances a variety of reasons for this claim⁵, including that benefits remain significant, whilst risks in respect of services below 1Gb/s are low.

We consider that this claim is largely groundless, as restricting the services that can be deployed over DFA significantly affects both its benefits and its costs (see Section 4 below, which discusses the impact of the usage restriction). The DFA remedy in the 2016 BCMR was made, amongst other reasons, in response to a finding of SMP in services above 1Gb/s, a rationale that has fallen away given the CAT's judgment. Therefore, benefits of DFA are necessarily reduced relative to the case made in the 2016 BCMR. Furthermore, substantial risks remain for investors in fibre networks despite the usage restriction on DFA, as we discuss below.

In any case, if it were the case that the service restriction on DFA enhanced its net benefit, this would arise because there were net costs associated with the use of DFA in providing high bandwidth services above 1Gb/s. However, Ofcom's argument for dark fibre in the 2016 BCMR dismisses this possibility, as Ofcom saw the introduction of DFA as being largely without adverse impact, yet

⁵ See §1.12 of the Consultation.

with potential benefit if it opened up possibilities for innovation by CPs. There is tension in arguing now that the revised DFA remedy offered in the Consultation is better, when the original BCMR Statement should have picked the best remedy amongst the alternatives available at that time; these alternatives could have included restrictions on how dark fibre might be used, or a different basis for setting access pricing to reflect the impact of using dark fibre to provide very high bandwidth services.

Ofcom also point to the fact that BT has already incurred costs in developing a DFA product in response to the 2016 BCMR Statement as a reason that the case for dark fibre is now clearer. As a matter of principle, one should be highly sceptical about arguments that seek to justify an action on the basis that one has already started down a line and there is no way back. BT's development of a DFA product does not commit Ofcom to introduce DFA, either to any particular timetable or at all. Any costs already sunk by BT in development of the DFA product are trivial in comparison with the future effects that DFA could have on those providing, or planning to provide, fibre-based networks.

Shaky foundations for the DFA remedy

Although the CAT's judgment concerned Ofcom's market definition, BT's appeal of the 2016 BCMR decision was much broader and included grounds of appeal related to the analysis of the costs and benefits of DFA undertaken by Ofcom and the proportionality of the remedy. The CAT did not need to rule on these aspects of the appeal as the foundations of Ofcom's decision – the market definition – were in error. Despite the CAT's judgment being limited to questions around market definition, Ofcom can draw no comfort from the judgment to support its general approach to DFA.

Ofcom does not now have an extant finding of SMP in respect of CISBO services above 1Gb/s. Therefore, DFA (as formulated in the Consultation with contractual limitations in its usage) is being proposed solely as a remedy to SMP in services below 1Gb/s (in the relevant geography). However, Ofcom has provide a reasonable explanation why it considers that DFA targeted at lower bandwidths provides any additional net benefit relative to the proposed remedies on active services alone, of which the key aspect is the charge control.

Dark fibre provides operators with connectivity scaleable to very high bandwidths; its theoretical capacity in the order of terabits per second or even petabits per second. To the extent that dark fibre might provide opportunities for innovation – which has always been a key plank of Ofcom's case for DFA – it is reasonable to expect this to be associated primarily with higher bandwidth services.

It would be wrong for Ofcom to introduce DFA as an adjunct to the proposed suite of remedies for active services (a charge control and other obligations including non-discrimination) unless there is a clear *incremental* benefit from adding DFA to that suite of remedies given the SMP findings that Ofcom has made so far. Put simply, DFA should not be added on the off-chance that other remedies might be insufficient. Nor should bandwidth-limited DFA be used to maintain the option for Ofcom to implement full DFA more easily at some later date. Rather, such an intervention would need to stand on its own merits and be made in response to some finding of SMP in respect of services above 1Gb/s, which has not so far been made. Even with the usage restriction at 1Gb/s currently proposed, the DFA runs considerable risks of depressing incentives to invest in fibre. Proper consideration of this trade-off inherent in DFA should not be avoided by breaking down the introduction of DFA into smaller phased steps and then arguing, on the basis of steps taken so far, that the impact of a further step is small; this would amount to regulation by stealth.

Potential future SMP findings and investment risk

Ofcom has left open the possibility that further analysis undertaken in response to the CAT judgment might lead to a possible future finding of SMP in regard to leased lines above 1Gb/s.⁶ Ofcom's finding of SMP below 1Gb/s does not imply an absence of SMP above 1Gb/s, but rather that Ofcom has yet to make its mind up.

It is not clear when Ofcom expects to update its market analysis and competition assessment. At this point, any investor in fibre networks faces a risk that Ofcom's SMP assessment in regard of services above 1Gb/s could change. The proposed DFA remedy, with provision for a contractual usage restriction to services not exceeding 1Gb/s, could be readily modified to remove the usage restriction, in effect restoring the position as proposed in the 2016 BCMR. This would be quick and simple for Ofcom to do, as Openreach would already have processes in place for selling wholesale dark fibre and removing the usage restriction would be a contractual matter changed at the stroke of a pen; any compliance activities required to implement the bandwidth limit would just fall away.

We cannot anticipate here what findings Ofcom might reach in the future with regard to services above 1Gb/s. Nevertheless, any such assessment would need to consider very carefully geographical aspects of the competition analysis. In particular, higher bandwidth

⁶ For example, see 1.11 of the Consultation.

users tend to be clustered in areas where there are multiple communications providers; such users tend to value choice and also the opportunities for redundancy through connections with multiple providers (e.g. multiple Internet connections using BGP). Therefore, conditions of competition for higher bandwidth services are very different to those for services below 1Gb/s. Ofcom's failure to engage appropriately with this interaction between geographical and product elements of market definition was one of the problems highlighted in the CAT judgment. Ofcom also failed to adopt an appropriate methodology for identifying geographical variation in conditions of competition, in particular failing to identify competition in certain central business districts.

Against this background of Ofcom's failures to identify competitive conditions correctly, any investor in fibre networks would most likely consider themselves at risk of damage from possible future relaxation of the usage restriction on DFA. Pricing of dark fibre is set relative to 1Gb/s active services, despite fibre being able to supply much higher bandwidth services. Therefore, an investor in fibre would face loss of revenue from higher bandwidth services if the DFA usage restriction were relaxed in its supply area. On the basis of experience to date, a rational investor would fear that Ofcom might fail to identify all relevant areas of competitive, or potentially competitive, supply of fibre-based services and to restrict the geographical availability of DFA accordingly. Furthermore, even if Ofcom were to conduct a most careful competition analysis, investors face asymmetric risks from regulatory errors; if the geographic extent of BT's SMP is drawn too narrowly, this would not create a countervailing benefit balancing the risk of undermining investment returns if the geographical extent of SMP is drawn too widely.

There have been important developments in the marketplace since Ofcom gathered its information for the 2016 BCMR. Vodafone and CityFibre have announced plans for a £500m strategic partnership to bring fibre to many towns and cities.⁷ This suggests that there is considerable potential for competition in provision of fibre networks to grow further. Therefore, a policy objective should be to provide adequate incentives for investment now.

The proposed usage restriction on DFA to services below 1Gb/s does not amount to a credible commitment to maintain such investment incentives for fibre networks, as the restriction can be removed readily. Ofcom has explicitly reserved its position on competition conditions services above 1Gb/s in the light of the CAT judgment. However, this uncertainty undermines *current* investment incentives.

⁷ Press release on 9 November 2017. See <https://www.cityfibre.com/news/vodafone-cityfibre-bring-gigabit-speed-fibre-uk/>

Given these concerns about investment incentives, a natural question is why Ofcom feels it necessary to introduce DFA precipitately, as part of the 2016 BCMR process but much delayed due to BT's appeal and the CAT's subsequent judgment. The three-year market review cycle required by the EU regulatory framework would in any case require a further market review in 2019. Therefore, it is very unclear why Ofcom feels the need to propose DFA now as an additional remedy to an SMP finding in services below 1Gb/s when there would be opportunity to re-evaluate services above 1Gb/s and, if in Ofcom's view circumstances warranted, make more refined proposals for DFA as part of the probable 2019 BCMR.

Irreversibility, uncertainty and timing

The introduction of DFA is not a readily reversible decision, as once CPs start using dark fibre as part of their own networks, it may be difficult to subsequently remove or reduce the availability of the dark fibre; significant decisions about network planning and basic network topology may be made by CPs on the basis of the proposed regulated pricing of DFA.

This irreversibility extends not just to the availability of dark fibre, but also its pricing and changes to any usage conditions that left any existing users of DFA worse off. For instance, it might be difficult for Ofcom to significantly raise the price of DFA due to the adverse effect on users. If the proposed 1Gb/s usage restriction were subsequently removed, this would also be difficult to reverse.

Where decisions are difficult or costly to reverse and made under conditions of uncertainty, it is desirable to adopt a precautionary approach, ensuring that the benefits of any committed action are sufficient to outweigh any loss of option value arising from waiting and seeing, and making a decision later in the light of fuller information. This precautionary principle is clearly applicable to the introduction of dark fibre.

3 Costs and benefits of DFA identified in the 2016 BCMR

The current Consultation relies heavily on the arguments for DFA advanced by Ofcom in the 2016 BCMR, though the proposals made there did not include a usage restriction. However, there are substantial problems with the approach that Ofcom took. The 2016 BCMR Statement is not a reliable starting point for any analysis of the costs and benefits of DFA, which in turn is essential for demonstrating the proportionality of the suite of remedies.

The essence of Ofcom's argument in the 2016 BCMR was that:

- by setting the price of DFA relative to the price of a reference active service, there is little downside risk from dark fibre as Openreach should earn similar margins if dark fibre substitutes for the active reference service; and
- at the same time, DFA opens up possibilities for innovation by CPs as they can use fibre directly, rather than intermediated by Openreach's terminal electronics.

Costs from constrained pricing flexibility

A key problem with Ofcom's argument is that dark fibre is used to provide a portfolio of services at different bandwidths, not just the reference active service. There are active services at different bandwidths, such as 10Gb/s, and also very high bandwidth optical services (which are not presented as standard Ethernet). All of these various services at bandwidths well above 1Gb/s could be supplied over Openreach's dark fibre, yet dark fibre would be priced by reference to the 1Gb/s service, not any higher bandwidth service.

Any fibre-based operator relies on being able to recover the costs of its infrastructure through price differentiation. Although a single fibre might be able to carry many terabits per second, services are presented and priced according to bandwidth limitations. This price differentiation is essential to making fibre investment viable, with higher bandwidth users making a greater contribution to recovering the largely fixed costs of providing the fibre infrastructure, at the same time that lower bandwidth users can be offered a price that is attractive relative to alternative (copper-based) services. Without this price differentiation, overall demand for fibre-based services would be reduced.

Openreach price differentiates within its regulatory requirement not to unduly discriminate by offering a menu of active services at different bandwidths and optical services at even higher bandwidths. All these services use the same underlying fibre infrastructure but are priced differently. Other fibre-based providers also price differentiate, but often in more complex ways given they do not face the same regulatory constraints as Openreach. For instance, services may be aimed at different types of businesses or prices individually negotiated.

The impact of DFA priced off the back of active service depends greatly on the choice of the reference service. Clearly if a higher bandwidth service is used – say 10Gb/s rather than 1Gb/s – this greatly reduces the potential erosion of margins from higher bandwidth services. Therefore, the detailed design of the DFA remedy is important. The adjustment to the price of dark fibre due to the CMA's findings on the NDR differential cannot be dismissed as irrelevant to any assessment of the impact of a DFA remedy.

If a DFA remedy without a usage constraint were based on a 1Gb/s reference service, this would create a significant constraint on the pricing flexibility of all fibre-based providers (not just Openreach). In particular, providers would likely to need to rebalance prices, lowering those of high bandwidth services to reduce cannibalisation by dark fibre, and raising those of lower bandwidth services to claw back margins lost on higher bandwidth services. This pricing constraint would be likely to reduce the overall return expected from a fibre investment. Furthermore, the ability of providers to increase the price of lower bandwidth services may be limited by other copper-based substitutes.

Ofcom did not consider this problem of constraining pricing flexibility as a cost of DFA in the 2016 BCMR and it remains highly relevant to the question of investment incentives for fibre operators given that the restriction of DFA to services not exceeding 1Gb/s can be so readily removed. In principle, Ofcom could have tried to identify substitution of higher bandwidth services by dark fibre (or indeed by lower bandwidth active services if there was price rebalancing) and sought to assess this effect in investment incentives. However, it became clear in the course of preparation of Joint Expert Reports during BT's appeal that Ofcom maintained the assumption that gross margins earned on higher bandwidth services and the 1Gb/s reference services were the same (given a lack of specific information that they differed), meaning that any such substitution would be inconsequential for investment returns. However, this assumption is wrong, as shown in evidence submitted by Ofcom itself, which demonstrates higher gross margins being earned by Openreach (and likely other fibre-based providers too) on higher bandwidth services.

Even if it were possible to identify the likely current scale of substitution of higher bandwidth services by dark fibre and assess the extent of margin erosion, it is not the case that this issue can be addressed adequately by relaxing the price control on active services for this price control period. (For example, letting the price of both the reference active service and dark fibre increase to compensate for margin erosion on higher bandwidth services.) For a fibre investor, the constraint on pricing created by setting the DFA price relative to a reference active service at a middling bandwidth within Openreach's product portfolio has long-term and enduring effects. It is reasonable to expect that the ability to recover the costs of a fibre investment over its lifetime to be strongly dependent on future demand for higher bandwidth services, as demand shifts towards higher bandwidths over time. Therefore, a fibre investor would be exposed to the treatment of DFA pricing over a significant time period.

Innovation benefits

According to the 2016 BCMR Statement, a key benefit of DFA is that it would allow innovation in services, as access to the underlying dark fibre would allow CPs to use different protocols and to take responsibility for fault monitoring. However, these benefits are necessarily speculative in nature and occur over an uncertain time frame.

Furthermore, Ofcom has argued that CPs might be able to gain a 'first-mover advantage' by being able to differentiate services without needing to seek a corresponding active wholesale service from Openreach to support their new service; at present any new wholesale service created through Openreach's Statement of Requirements process needs to be made available to other CPs due to the non-discrimination requirements on Openreach.

In practice, there is a high degree of standardisation on Ethernet presentation for connectivity up to and including 10Gb/s. Therefore, it is entirely unclear whether the claimed innovation benefits would be significant. For example, backhaul for 5G mobile cell sites has standardised on Ethernet, rather than optical access to fibre, in order to provide maximum flexibility in using different providers of connectivity.

Standardisation is also relevant to the claim that DFA might provide first-mover advantages to innovators. In practice, CPs' service characteristics are determined by the equipment they use to deploy them, which is in turn obtained largely from global manufacturers who offer standardised equipment across many national markets. The need for scale economies at the global level in equipment manufacturing fundamentally limits the ability of any one CP to create a radically differentiated service. Even Openreach itself does not have significant scale as a buyer given these markets are essentially global.

In the 2016 BCMR, Ofcom did not contrast and compare the benefits of full infrastructure competition with those that might arise from DFA. End-to-end control of all aspects of the value chain through infrastructure investment must necessarily provide greater opportunities for innovation than DFA. Therefore, if DFA erodes incentives to invest in fibre infrastructure, this may discourage innovation rather than enhance it. Furthermore, to the extent that there are any concerns that Openreach's incentives to innovation might be deficient, full-infrastructure based competition would provide a much more effective spur; this would be blunted if DFA reduces incentives for competitors to invest in fibre infrastructure.

Productive efficiency benefits

The other main category of benefit from DFA identified in the 2016 BCMR Statement was productive efficiency, meaning that certain activities within the value chain for active services undertaken by Openreach could be provided by a different party, potentially at lower cost. In particular, terminal electronics and consumer interfaces would not necessarily have to be provided by Openreach; even if a CP used DFA to offer a similar active service to that provided by Openreach (so its services was not innovative), it might be able to do so at lower cost.

Whilst it is certainly the case that the provision of terminal electronics by Openreach could be bypassed by DFA, the magnitude of any cost savings are limited by electronics costs being a relatively small share of the overall cost stack.

Certain aspects of the fault monitoring and repair process could also be undertaken by CPs using DFA. However, certain faults would still remain the responsibility of Openreach as the provider of dark fibre. Therefore, there would also be coordination issues raised by DFA in terms of how diagnostic processes would be managed and information shared. For instance, irrespectively of the engineering details, if a CP's terminal equipment could not provide appropriate diagnostic information, Openreach might need to connect test equipment to a fibre. This involves new processes and also some degree of shared responsibility for fault diagnosis. In turn, there are likely additional costs associated with this separation of responsibilities and the possibility of coordination failures between Openreach and users of dark fibre. This was not considered as an offsetting cost by Ofcom.

Lack of an appropriate balancing framework

Ofcom's analysis in the 2016 BCMR did not take the form of a typical balancing of costs and benefits and a demonstration that the latter exceeded the former. Rather, Ofcom's claim was that costs were minimal and that there was the potential for benefits. Ofcom adopt essentially the same approach in the Consultation. Therefore, Ofcom denies the usual trade-off expected when mandating access, that in controlling SMP even well-designed access regulation might suppress investment incentives.

In presenting its assessment of DFA in the 2016 BCMR, Ofcom also adopted inconsistent timeframes for the assessment of costs and benefits. In particular, the consideration of costs arising from DFA were limited to the final two years of the control period (2017/8 and 2018/9), occurring only once the mandated dark fibre product was available and being truncated by the end of the control period. On the other hand, the benefits arising from greater innovation and

enhanced productive efficiency accrued over the long-term and were not truncated by the end of the control period.

Clearly a consistent timeframe is required within which to compare costs and benefits. Given the long-term and difficult to reverse nature of the decision to introduce DFA, costs and benefits should be assessed looking forward. This would include considering the costs of the remedy arising from the possibility of a constraint being imposed on pricing of higher bandwidth services at some future time and the erosion of demand for such services, which can be expected to grow over time.

In the current Consultation Ofcom refers to its conclusion in the 2016 BCMR that the risks of DFA could be limited through appropriate design of the remedy.⁸ However, the arguments advanced in the 2016 BCMR for limiting the risks of DFA were highly problematic.

First, in proposing the 1Gb/s reference price in the 2016 BCMR – a formula inherited by the current proposal in the Consultation – Ofcom simply sought a ‘sweet spot’, where the price of dark fibre was sufficiently low to elicit demand, but, at least in Ofcom’s view, sufficiently high to avoid excessive cannibalisation of margins or substitution of higher bandwidth services. However, the existence of such a sweet spot cannot be assumed and such an argument is not an alternative for a demonstration that a proposed remedy has benefits that exceed costs, as regulatory impact analyses typically provide. Furthermore, as discussed above, the risk of impact on incentives to invest in fibre has not been removed by the usage restriction now proposed given investors have no guarantees that the restriction might be subsequently removed.

Second, in the 2016 BCMR Ofcom also argued that costs of DFA were limited because it had powers to modify the terms of any DFA remedy subsequently if it became clear that there were problems. This argument is highly problematic as goes against the principle of creating predictable regulatory policy that Ofcom and other NRAs typically follow. A promise that problems might be fixed later is not an adequate response to the risk that DFA might depress investment incentives now. Indeed, if DFA were priced at a level that discouraged fibre investment there might not be much hard evidence of the adverse effect, as investment would simply have not occurred.

⁸ For example, §3.10 of the Consultation.

The relevant counterfactual for DFA

A further problem with the case for DFA advanced by Ofcom in the 2016 BCMR is that it fails to consider other significant policy changes that may lead to easier access to physical infrastructure for CPs and thus provide an alternative to DFA. In the current Consultation, Ofcom has still not explained why it considers these changes are not relevant to consideration of the net benefit of DFA.

There are two relevant policy changes:

- The Civil Infrastructure Directive (CID), which has already been transposed in UK law (as the 'Access to Infrastructure' Regulations) and came into effect in July 2016. This provides CPs to access various forms of infrastructure (not just telecoms infrastructure) for the purposes of deploying high-speed communications networks. Ofcom has said in the 2015 Digital Communications Review that the CID is "*an important starting point for implementing our strategy to make new network deployment easier and cheaper*"⁹. Whilst the CID is not an access remedy on foot of an SMP finding, it is still a relevant change that is intended to facilitate new infrastructure investment, including fibre networks;
- Ofcom is continuing to develop proposals for access to Openreach's ducts and poles. The intention to open up physical infrastructure access had already been signalled separately by Ofcom at the time of the 2016 BCMR (though not considered within the BCMR itself when assessing DFA). Since then, these proposals have been subject to further consultation¹⁰, with Ofcom indicating that duct and pole access is likely to come into force in April 2019.¹¹

Neither of these changes was considered by Ofcom in evaluating the benefits of DFA in the 2016 BCMR.

⁹ §4.31of the DCR.

¹⁰ https://www.ofcom.org.uk/__data/assets/pdf_file/0008/101051/duct-pole-access-remedies-consultation.pdf

¹¹ https://www.ofcom.org.uk/__data/assets/pdf_file/0024/109356/Revised-implementation-timetable-DPA-remedy.pdf

4 The current DFA proposals

The benefits of dark fibre

The categories of benefit identified by Ofcom in the Consultation remain the same as those identified in the 2016 BCMR:

- productive efficiencies related to cost savings in terminal equipment¹² and fault diagnosis and repair processes¹³; and
- innovation benefits.¹⁴

Whilst Ofcom now appears to place somewhat greater emphasis on productive efficiency gains, this analysis is incomplete:

- The specific gains achievable on terminal equipment depend on exactly what equipment is deployed on dark fibres. In some cases, there may still be duplication of equipment across the user and the CP (if these are different), as Ofcom itself acknowledges¹⁵.
- It is not clear what equipment might be required to police a contractual limitation to services exceeding 1Gb/s. This cost appears to have been ignored by Ofcom, even though it is conceivable that total terminal equipment costs might increase if there is need for terminal equipment both from the CP using the dark fibre to provide bandwidth-limited customer interfaces and from Openreach to monitor bandwidth use and contractual compliance.
- There is no consideration of additional costs that could arise due to the separation of fault diagnosis functions between Openreach and the dark fibre user and the poor incentives that this could create.
- It is not clear that the assessment of the scale of potential cost savings is correct, which we return to in Section 5 below.

Ofcom also appeals to a catch-all category of “other cost savings” due to a greater part of the value chain being contestable.¹⁶ However, no specifics are offered by Ofcom as to what these might be.

¹² Consultation, §4.13 and following

¹³ Consultation, §4.30 and following.

¹⁴ Consultation, §4.39 and following.

¹⁵ See §4.13 and following of the Consultation, where various scenarios for terminal equipment are considered.

¹⁶ See §4.35 of the Consultation.

With regard to innovation, Ofcom's case for benefits remains largely the same as that made in the 2016 BCMR Statement, namely that there might be potential benefits associated with DFA by allowing service differentiation of various types and that there might be first-mover advantages for innovators if Openreach can be bypassed. We have already discussed in Section 3 above that these claims are overstated and fail to consider that:

- only a small part of the value chain is exposed by DFA;
- opportunities for differentiation of services and first-mover advantages are constrained by pressures for equipment standardisation at a largely global scale;
- DFA might suppress incentives for investment in competitive fibre networks and so depress incentives for innovation both by Openreach and other CPs that might otherwise have been spurred by full infrastructure competition.

There is also good reason to expect that a usage restriction on DFA to 1Gb/s will constrain opportunities for innovation; we turn to this next.

Usage restriction to 1Gb/s

The Consultation proposes that the use of DFA be contractually limited by BT to the provision of services not exceeding 1Gb/s. This change to DFA relative to the 2016 BCMR proposals has a number of implications for the analysis of costs and benefits:

- In the short-run, take-up of dark fibre is likely to be much more limited, as Ofcom itself acknowledges.¹⁷ First, demand from users above 1Gb/s is excluded immediately. Second, dark fibre becomes much less useful for users who might currently intend to deploy services below 1Gb/s, but who want future expansion possibilities. Lower take-up reduces the benefits of dark fibre.
- Notwithstanding these effects on take-up, there may still be a chilling effect on fibre investment incentives. If effective, the usage condition reduces the potential for cannibalisation of services above 1Gb/s – both through substitution by dark fibre and changes in the pricing structure reducing gross margins on high bandwidth services will be mitigated. However, once DFA is in place, the usage condition can be readily removed, as the processes for supply of dark fibre by Openreach and other regulatory conditions could be unchanged and Ofcom could simply prohibit the contractual restriction. Given expected asset lifetimes, an investor in

¹⁷ See §4.5 of the Consultation.

fibre infrastructure will consider themselves at risk of future returns from higher bandwidth services being undermined by any subsequent removal of the bandwidth limitation. Therefore, the usage condition is not a credible or effective protection for infrastructure investors.

- At the same time, there are possibly significant short-run costs associated with imposing a contractual usage restriction to 1Gb/s, as Openreach would need both equipment and processes to conduct monitoring. Furthermore, for the purposes of imposing a contractual obligation, it is not necessarily straightforward to define transmission rates other than by reference to a particular technological standard (e.g. Ethernet), as control frames need to be transmitted on top of the actual data payloads. Therefore, there would appear to be some ambiguity about what the usage condition might mean in practice, which might lead to disputes were CPs to deviate significantly from typical standards (which would seem to be the implication of Ofcom's claim that there might be service innovation). However, Ofcom appears to have made no assessment of the scale of the costs of implementing a bandwidth limitation;
- The scope of innovation is much reduced, as services at lower bandwidths are much less differentiated. Any scope to offer specialised services at high bandwidths is precluded. Therefore, any claimed potential innovation benefits must be reduced accordingly.

5 Cost savings and productive efficiency benefits

We now turn to the question of the scale of any productive efficiency benefits, which are largely due to cost savings associated with terminal equipment. The cost of terminal equipment is also the largest component in the calculation of the active differential used to set the DFA price relative to the price of the active reference service.

In this regard, both for any assessment of the potential for productivity efficiency benefits and for setting the active differential, costs need to be assessed on a purely incremental basis, i.e. without any allocation of common costs. If the active differential were to include some common costs, then it would follow that dark fibre would make a smaller contribution to common costs than the active reference service. Therefore, substitution of the active reference service by dark fibre would entail a need for those common costs to be recovered from some other services provided by Openreach and not leased lines. A broader reallocation of common costs would need to be considered; prices of some other services would then be higher than they would otherwise have needed, entailing a further cost to the dark fibre remedy. Clearly these complications arising from

reallocation of common costs would be avoided if the active differential were set on a pure incremental cost basis.

Equally in assessing any potential for productive efficiency gains, costs savings from DFA also need to be considered on a pure incremental cost basis. If the price of DFA is lowered such that the recovery of common costs needs to be shifted to other products, this is a reallocation of common cost, not a potential productive efficiency gain.

Ofcom points to cost savings of around £4,00 per year from using dark fibre, rather than taking the active reference service. This saving includes an assessment of the costs to the CP of providing its own terminal electronics and maintenance. The methodology is set out in Annex 5 of the Consultation and is based on taking the active differential in Openreach's 2016 Reference Offer and then adjusting this for the NDR differential (which lowers the DFA price further, but this is modest at around £40 per year) and for changes in costs over time (again modest).

In our view, the outcome of these calculations strains credibility. To create a £4,00 per annum cost saving, if this were entirely due to capital cost saving this would require a reduction in assets employed of about £4,000. Our understanding is that terminal electronics for a 1Gb/s costs in the order of a few hundred pounds per box.

The underlying problem appears to be that the proposed active differential of around £650 per annum (which varies somewhat depending which type of service is taken) appears to include not only the pure incremental cost savings from taking dark fibre rather than the active reference service but also some allocation of common costs. Ofcom notes that the *fully allocated cost* for terminal electronics is very similar to the active differential.¹⁸ This is suggestive that common costs have been incorrectly included in calculating the active differential. We understand that BT has itself undertaken a re-evaluation of the active differential and considers that some corrections may be required to strip out common costs allocated due to past accounting practices, which clearly could not anticipate dark fibre access.

6 Conclusions

Overall, Ofcom has not provided any fundamentally new reasoning to support the introduction of a DFA remedy relative to the 2016 BCMR Statement, which was itself significantly flawed. Ofcom continues to avoid making an explicit comparison of the costs and

¹⁸ See Consultation, A5.9.

benefits of DFA on a consistent basis over a common timeframe. Rather, Ofcom relies on arguments that the costs of intervention are limited and that there might be potential benefits, those these are uncertain and accrue in the future.

The limitation of DFA to services not exceeding 1Gb/s has the potential to reduce some of the adverse impact of the previous DFA proposal on the returns that fibre-based infrastructure operators might expect to earn from higher bandwidth services. However, because this bandwidth restriction is so readily removable and because Ofcom has explicitly left the door open to possible SMP findings in respect of some higher bandwidth services, infrastructure investors looking forward can take very little comfort from this modification of the DFA remedy. Rather, we must expect a chilling of fibre investment incentives due to DFA even with a usage restriction in place.

Therefore, it still remains the case that Ofcom has failed to engage with the most fundamental issue around any access intervention: the extent to which incentives for competitive infrastructure provision might be undermined. Furthermore, since the 2016 BCMR the competitive landscape has significantly changed, with new fibre investment planned and Ofcom pushing ahead on physical infrastructure access to ducts and poles. It is important that Ofcom does not strangle this emerging competition, limiting the geographical extent of competitive fibre infrastructure.

It would be disproportionate for Ofcom to introduce DFA – alongside the other remedies imposed on active services, including the charge control – on the basis of an SMP finding in respect of services below 1Gb/s. To the extent that DFA has the benefits claimed by Ofcom – in terms of providing flexibility and potential for differentiation and innovation by CPs – these would be much more relevant to higher bandwidth services than lower bandwidth ones. Undermining infrastructure investment incentives ultimately depresses innovation rather than encouraging it.