CityFibre

Promoting investment and competition in fibre networks

Approach to geographic markets.

Response submitted by CityFibre Infrastructure Holdings

Non-confidential Version

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Contents

1 Introduction and Executive Summary

1.1.1 CityFibre welcomes the opportunity to comment on Ofcom's proposed approach to geographic market definition. Geographic markets play a crucial role in the overall market review process, by which regulators determine whether and, if so, which regulation is required in any relevant market.

1.1.2 CityFibre particularly welcomes Ofcom's revised approach to defining geographic markets to include markets that are potentially competitive. CityFibre has argued in a number of market review responses that Ofcom needs to identify potentially competitive markets and apply regulatory remedies to encourage and protect any emerging competition. If it does not do so then the risks associated with investment in new fibre infrastructure are too high and the UK will continue to suffer from very low fibre deployment, to the detriment of private and business consumers across the country.

1.1.3 CityFibre further welcomes Ofcom's proposal to conduct the market reviews for the three fixed access markets together (the physical infrastructure market, the wholesale access market, and the business connectivity market (PI, WLA and BCMR respectively) together. It is a long held view of CityFibre that inconsistency in approach and objectives to how these markets are regulated has caused market distortions and has deterred investment in new fibre infrastructure, causing the UK to rank at or near the bottom of developed economies as regards presence of fibre infrastructure.

1.1.4 Although the consultation discusses all three fixed access markets, it seems that the proposal set out are only for the review of the WLA and BC markets, not for the PI market. If that is not the case, the we have misunderstood the consultation and would be grateful for clarification from Ofcom and the opportunity to submit a revised response.

1.1.5 CityFibre believes that significant benefits will result from a close coordination in approach and objectives when reviewing the PI, WLA and BC markets. Such coordination will enable Ofcom to apply regulation in a consistent manner to encourage innovation and investment in new fibre infrastructure to serve all both the WLA and the BCM (the PI being upstream from the fibre network).

1.1.6 It is not clear to CityFibre, however, whether significant incremental benefits would be realised from wholly or partly combining the WLA and BC market reviews, over and above the benefits from coordinating the approach and objectives when conducting the reviews in parallel. Our analysis of Ofcom's proposal suggests that the complexity resulting from an attempt to combine the definition of geographic markets for WLA and BC markets is disproportionate to any likely benefits from doing so. CityFibre, therefore, recommends that Ofcom should conduct three separate market reviews in parallel, in each of which it considers the impact on the other two markets of to which products, where and how regulation is applied.

1.1.7 This response is made on the assumption that the product market, for which the geographic market analysis is to be conducted, is the market for multi-service networks. This is not made explicit in the consultation, and CityFibre would be grateful if Ofcom would confirm this to be the case. If we are mistaken in that assumption, then we would be grateful for the opportunity to submit a revised response, once Ofcom has confirmed for which product market the proposed geographic market definition approach is intended. It is not, in our view, possible to review the proposed geographic market definition approach if applied to an abstract market. That is illustrated by Ofcom's extensive references to the different characteristics of broadband networks and leased lines-only networks.

1.1.8 CityFibre's review of Ofcom's proposals can be summaries as follows:

- Coordination of the three fixed access markets is a significant improvement to Ofcom's past approach and is welcomed by CityFibre;
- Defining potentially competitive markets is critical to Ofocm meeting its objective of encouraging deployment of competitive fibre networks across as much of the UK as possible;
- Ofcom should look to larger contiguous areas that individual postcode sector areas for defining geographic markets, although postcode sectors are useful building blocks;
- Ofcom's proposal to combine the geographic market definition process for WLA and BC markets appears unduly complex and any incremental benefits of doing this appear very limited;
- When identifying areas for category 2, Ofcom should apply a threshold of 10,000 premises rather than the proposed 20,000 premises. To not do so means that Ofcom will almost certainly include areas in category 3 which are viable for commercial fibre deployment.

1.2 About CityFibre

1.2.1 CityFibre is the UK's leading alternative provider of wholesale full fibre network infrastructure. With major fibre infrastructure projects across 51 towns and cities throughout the UK, we provide a portfolio of active and dark fibre services to our customers which include service integrators, enterprise and consumer service providers, local authorities and mobile operators. CityFibre is making significant investments in a number of cities across the UK as we look to rapidly expand the number of homes and businesses which have access to full fibre. CityFibre has recently partnered with Vodafone to bring ultrafast Gigabit-capable full fibre broadband to up to one million UK homes and businesses by 2021 and is targeting five million by 2025. This commitment has been reinforced by a £2.5bn investment programme which identifies towns and cities primed for FTTP expansion to reach nearly every home and business and build is underway. CityFibre is based in London, United Kingdom, and is privately owned by a consortium of Antin Infrastructure Partners and West Street Infrastructure Partners.

2 Ofcom's approach to regulation and geographic differentiation

2.1.1 CityFibre agrees with Ofcom that the reviews of the closely linked Physical Infrastructure (PI), Business Connectivity (BC), and Wholesale Local Access (WLA) markets should be coordinated to ensure a consistent approach is taken. This is because the BC and WLA markets depend on the same physical infrastructure (in the PI market) and, increasingly, the same fibre networks. We agree with Ofcom that close coordination of how these markets are regulated should result in a more holistic and consistent approach to all fixed access markets.

2.1.2 Ofcom's recognition that, to encourage investment in new fibre infrastructure, it is important to differentiate between regulation applied in potentially competitive markets, and in non-competitive markets[1] is critical. CityFibre strongly supports Ofcom's proposal to define three different geographic market categories, namely 1) Competitive areas, 2) Potentially competitive areas, and 3) Non-competitive areas. CityFibre believes that this approach will allow Ofcom to balance its short term duties to protect consumers with its long term objective of encouraging investment in new competitive fibre infrastructure.

2.1.3 CityFibre further agrees with Ofcom's definition of the three categories and considers that, if Ofcom focuses on defining categories 1 and 3 correctly, then category 2 is, by definition everywhere else. Once those areas that may be effectively competitive (where three or more networks are 'present')[2], and those areas where commercial network deployment is very unlikely are defined, then the remaining areas are by definition potentially competitive.

2.1.4 CityFibre agrees that the threshold for defining category 1 should be that BT plus two or more other operators are 'present'. This threshold is supported by a substantial body of international research[3]. It may be that category 1 proves to not be effectively competitive, but that is not a problem, the purpose at this stage is to define sufficiently homogenous areas that differ significantly from their neighbouring areas, to justify a separate relevant market. SMP analysis will determine whether that market is in fact effectively competitive. Even if Ofcom finds that BT has SMP in all markets, it is likely that different remedies will be appropriate in each category – perhaps even in sub-sets of each category.

2.1.5 CityFibre agrees with Ofcom that it is extremely important that potential future network roll-out is taken into account when defining areas for category 2. We expand on that in section 5 of this response.

2.1.6 It is not clear to CityFibre whether Ofcom intends that the proposed approach to geographic markets should apply to all three access markets (PI, WLA and BC). The consultation states that the outcome of the full market review consultation to be commenced in the autumn of 2019 will replace all existing regulation resulting from the PIMR, WLAMR and the BCMR[4]. It seems to CityFibre, though, that this consultation does not look at the process of defining geographic markets at the physical infrastructure (PI) level, but only at the downstream level of the BC and WLA markets.

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[1] Although a matter for remedies rather than geographic market definition, it should be noted that potentially competitive and non-competitive markets cannot be regulated independently of each other: Regulations in non-competitive markets will affect investment incentives in potentially competitive markets.

[2] See CityFibre's views on the relevant parameters for defining this category in section 4 below

[3] See Annex 1, which provides and overview of some of the most relevant international references.

[4] See paragraph 1.5.

2.1.7 Although a PI market review is currently ongoing, CityFibre would welcome clarity from Ofcom as to what the proposed approach will be to defining geographic markets at the PI level for the forthcoming combined review process.

2.1.8 It would also be helpful to understand whether Ofcom plans to issue three separate consultations and decisions, or whether, perhaps, the two downstream market will be merged? It is CityFibre's view that, as fibre is deployed more widely, the WLA and BC markets are likely to converge. This is primarily due to users of lower speed leased lines moving across to using gigabit speed broadband connections. It is, however not clear, whether that change is likely to happen in the next 2 years before the new market review takes effect. Although the two markets may converge during the 5-years review period, it is important that there is not a presumption that this will happen, as that could lead to the necessary regulatory conditions to make it happen not being put in place.

2.1.9 CityFibre believes that more clarity is required on Ofcom's expectations in relation to the level of differentiation required between the WLA and BC markets. It is not completely clear how Ofcom will address situations where competitive dynamics vary between the two markets. The proposed approach to combining the geographic market definition for WLA and BC markets could miss current and future market and technology developments that are specific to either the WLA or the BC. The focus on broadband networks to define the relevant geographic markets could cause Ofcom to miss significant developments in one of the markets.

2.1.10 Ofcom refers in paragraph 1.12 to the concept of 'multi-service networks'. Whilst not explicitly stated, we believe that the product market, for which the proposed geographic market analysis approach will be applied[5], is the market for multi-service networks. CityFibre would be grateful if Ofcom could confirm that clearly.

5 See paragraph 55 of the EC SMT guidelines: Once the relevant product market is identified, the next step to be undertaken is the definition of the geographical dimension of the market. It is only when the geographical dimension of the product or service market has been defined that a NRA may properly assess the conditions of effective competition therein.

3 Ofcom's approach to geographic units

3.1.1 CityFibre agrees that individual customer premises should be aggregated into larger groups, as it would be impractical to consider competitive conditions at each of the 29 million premises in the UK. CityFibre considers that it would be inappropriate to use Openreach's exchange areas. This was correctly explained by Ofcom, in particular that "rival network deployments are less likely to match precisely to the Openreach exchange area"[6].

3.1.2 From an analytical perspective we understand why Ofcom would want to use postcode sectors. As Ofcom explains in paragraph 4.14, there are a number of tools available for carrying out analysis per postcode sector. However, we are concerned that postcode sectors do not reflect how developers of fibre networks make investment decisions. Ofcom appears to recognise this in paragraph 3.15:

3.1.3 "Network deployments are unlikely to be planned to match precisely onto postcode sectors" (3.15)

3.1.4 Ofcom is right that an operator is unlikely to build its network to match postcode sectors precisely. Rather it decides to build networks in a town or city, based on the density of business and residential premises, or to connect specific locations/premises based on specific customer requirements. CityFibre makes investment decisions on the basis of a cluster of potential customers within a defined area, combined with the presence of an anchor contract that helps underwrite part of the initial capital investment. CityFibre would look for a cluster of residential and business premises to deploy hybrid broadband/leased lines networks (multi-service networks).

3.1.5 For the deployment of multi-service networks, CityFibre would in the past have looked for a cluster of mixed premises of around 20,000[7], in order to consider it commercially viable for investment. However, this threshold has fallen substantially since the introduction of duct and pole access (DPA), which significantly reduces the cost of entry into a geographic market, reducing the sunk cost of civil engineering. DPA means that operators can now economically enter a market of around 10,000 properties. Most operators would, however, not consider cluster of premises significantly smaller than 10,000 and CityFibre therefore recommends that Ofcom uses 10,000 as a reasonable minimum size of an area that can be subject to different regulatory interventions.

3.1.6 According to Table 3.1, there are some 10,000 postcode sectors covering 29 million premises, meaning that each postcode sector covers on average 2,900 premises. This would suggest that Ofcom could base its analysis of clusters of around four postcode sectors rather than individual sectors.

3.1.7 We believe that this approach would be better than looking at individual postcode sectors because we are concerned that some geographic cohesive areas (such as a town or city) may comprise postcode sectors with different degrees of coverage, meaning that one cluster of 10,000 premises may consist of postcode sector(s) falling into each of categories 1, 2 and 3.

3.1.8 This could likely lead to perverse investment incentives where remedies may disincentivise regulation in one part of the town/cluster[8] whilst actively encouraging it in another. Whereas

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[6] See paragraph 3.18.

[7] CityFibre has previously stated to Ofocm that It looked to deploy fibre networks in towns and cities of 50,000 people and above. This is similar to the 20,000 premises threshold.

[8] In large towns and cities, CityFibre accepts that different areas may fall into different markets/categories, but it is still important that such areas are not small and result in the 'swiss cheese' effect.

without regulation, an operator would look at the town/cluster as a whole as an investment opportunity. Subsets of a town of between 10,000 and 20,000 premises are unlikely to attract investment in new fibre infrastructure, but the whole town could.

3.1.9 In summary, we agree that postcode sectors are a sensible building block and are practical for analytical purposes. However, we consider that clustering postcode sectors together to cover coherent geographic units of at least 10,000 properties would be less likely to distort investment incentives, as such clusters more accurately reflect actual investment locations.

3.1.10 CityFibre considers that single postcode sectors are likely to be too small as meaningful areas in which to impose differentiated regulatory remedies. This is discussed in more detail in section 5 of this response

4 Ofcom's proposed threshold for network presence

4.1.1 Ofcom analyses the presence of competing networks and proposes to define the boundary between categories 1 and 2 areas, using network presence. Ofcom proposes that a network should be considered as being 'present' in a postcode sector if it can serve[9] 65% of the premises in that postcode sector[10].

4.1.2 Ofcom argues that to require that a network can serve 100% of premises is unrealistic and Ofcom further states that in order to be considered present, a network "needs to cover sufficient premises in the area to provide a competitive constraint[11]". CityFibre agrees with that position.

4.1.3 Ofcom further states that "*For the effectively competitive test, the choice of threshold needs to be considered alongside other elements of the SMP assessment*"[12]. CityFibre again agrees with Ofcom that the definition of a relevant geographic market is simply the first step in the process of determining whether any party(ies) has SMP in that relevant product and geographic market.

4.1.4 After completing the product and geographic market definition analyses, it is necessary to undertake SMP analysis within each of the relevant product and geographic markets defined. Ofcom concludes this analysis by stating " *So, the choice of a lower threshold does not necessarily lead to more areas being identified as effectively competitive*[13]"

4.1.5 It is CityFibre's view that market definition and SMP analyses are and should be separate activities, but it seems that Ofcom may, in fact, here be consulting on a combination of geographic market definition and SMP analysis. CityFibre does not consider this is necessarily a significant issue, as long as the analysis is transparent.

4.1.6 Ofcom argues that a lower threshold for a network to be considered present "*may be more likely to identify an area as potentially competitive on the basis of current or planned network presence. Given that we want to promote network competition where possible, we consider that a relatively lower threshold – which could identify some areas that ultimately are non-competitive areas as being potentially competitive – may be preferable to a higher threshold which could identify potentially competitive areas as non-competitive*[14]. CityFibre understands from the consultation, however, that the 65% threshold is there to define effectively competitive geographic areas (as derived from the name of Ofcom's category 1 area). If SMP analysis is conducted at the geographic market level, then it is much more likely that BT will be found to have SMP in the category 1 areas defined at the 65% level, than if, for example, a 90% threshold were to be used.

4.1.7 Ofcom has intimated when discussing this topic, that SMP analysis would be performed at the postcode sector level within the Category 1 areas. CityFibre does not understand the rationale for defining a geographic market that includes such significant differences in competitive conditions that a disaggregated SMP analysis within that market is required.

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[9] We note that Ofcom does not define what it means by a network being able to 'serve' premises. We assume that Ofocm means that the operator should be able to offer service to premises with very little or no additional network deployment required.

[10] Although we refer to post code sectors, Ofcom should note that CityFibre recommends that larger clusters be used as the minimum size of areas that are subject to different regulatory interventions.

[11] See paragraph 3.22.

[12] See paragraph 3.23, 1st bullet.

[13] See paragraph 3.23, 1st bullet.

[14] See paragraph 3.23, 2nd bullet.

4.1.8 BT would almost certainly be found to have SMP in more category 1 areas with a 65% threshold than if a higher threshold was used. To explain it is easiest to consider an extreme case. Suppose BT had two competitors in a postcode sector and these two covered the same 65% of that sector as each other. Assume also that demand is uniformly distributed across the postcode sector. In this case, BT's network will be the only option for 35% of customers in that area. The EC SMP guidelines state that a market share of >40% gives rise to a presumption of SMP. If BT has 100% market share in 35% of the market and perhaps between 30 and 40% market share in the remainder of the area, then its overall market share in that area would be significantly above the 40% SMP assumption threshold[15]. Using the 65% network reach threshold will therefore almost certainly result in BT being found to have SMP in those markets.

4.1.9 Ofcom refers to its use of the 65% threshold in past WBA market reviews as a justification for why it is appropriate in this current context. The current situation, however, differs significantly from the Wholesale Broadband Access market where Ofcom considered that Virgin Media was present in an exchange area if it covered 65% of that area. In WBA any operator that unbundled BT's exchange would, by definition, be present in the whole exchange area and BT would face competition everywhere. As there was a strong correlation between exchanges unbundled by Sky and TalkTalk then in most exchanges BT's faced two competitors in the whole area and three in at least 65%.

4.1.10 Using the 90% threshold would result in the category 1 postcode sectors having competition conditions that are more homogeneous and distinctly different to areas in category 2.

4.1.11 CityFibre agrees with the sentiment that it is preferable, at this early stage of fibre network deployment in the UK, that the potentially competitive market is defined to include as much of the country as possible. If experience then subsequently shows that operators do not find it viable to deploy commercial fibre networks in those areas then it is possible to change the criteria to move areas from the potentially competitive to the non-competitive market. We believe, however, that the best way of determining the scope of the potentially competitive market would be to focus on the definition of the effectively competitive market and on the non-competitive market. The potentially competitive market is then, by definition, everything in between those two.

4.1.12 With this approach in mind, CityFibre considers it more appropriate to use a higher threshold (than the 65% proposed by Ofcom) to determine whether a network is present in a postcode sector. In past BCMRs Ofcom has used a threshold of a network being able to reach 90% of relevant premises whilst,[16] in the most recent WLAMR, Ofcom used share of service market rather than network reach.

4.1.13 Ofcom also quotes that it has used the 65% threshold in WBA decisions[17], but, in addition to the points raised above in this regard, CityFibre has reservations of the applicability of those precedents to the markets included in the new combined fixed access markets review process. This is because the WBA market is downstream of the WLA market and is significantly reliant on BT's infrastructure (to unbundle exchanges), whereas the objective in the WLA and BC markets is

[15] In the 2019 BCMR, Ofcom proposed using the 65% network reach threshold to define competitive areas. In the areas defined using that threshold, BT's average market share was between 50 and 60% - See Table A12.15 in Annex 12 to the BCMR

[16] The current BCMR consultation has proposed using the 65% network reach threshold and CityFibre submitted a detailed analysis of that proposal and found that the 65% threshold was inappropriate for the business connectivity make. See [paragraphs 4.3.1 50 4.3.7 CityFibre BCMR response].

[17] See paragraph 3.24.

now to encourage investment and deployment of independent new fibre networks[18]. Further, as explained above, in the WBA market operators unbundling BT exchanges by definition have access to the entire exchange area, so it was only the Virgin Media presence that was considered adequate at 65% coverage. CityFibre is therefore not in agreement with Ofcom that the precedents listed by Ofcom are persuasive or relevant to the WLA and BC markets.

4.1.14 CityFibre is particularly concerned that the 65% network presence threshold does not create a valid geographic market as defined in the European Commission's SMP Guidelines. The purpose of defining separate geographic markets is that "*the conditions of competition are sufficiently homogeneous, and which can be distinguished from neighbouring areas in which the prevailing conditions of competition are significantly different. Areas in which the conditions of competition are heterogeneous do not constitute a uniform market.*"[19]

4.1.15 The make-up of a relevant geographic market defined using the 65% network reach threshold will very likely include a number of premises served by BT only and most certainly a relatively large number of premises served by BT + one other network (up to a maximum of 35%). That cannot be characterised as a homogenous market and it cannot be characterised as significantly different from the market where three networks can reach less than 65% of premises (say, where three networks can reach 55% of premises).

4.1.16 Furthermore, a significant portion of the market created would not satisfy the pre-set definition criterion, namely that there are a total of three networks present, including BT's network. Whilst Ofcom has assured CityFibre that it will undertake detailed SMP analysis of the individual postcode sectors that would be included in the market using the 65% network presence threshold, that additional step appears to be a consequence of having adopted an inappropriate market delineation at the outset. As the purpose of defining the geographic market in the first place is that it presents a sufficiently homogenous area in which a regulator can be justified in performing a single SMP analysis, it seems that Ofcom's proposal does not meet that criterion. If a geographic market requires detailed SMP analysis of the individual components making up that market, then it is not homogenous and is therefore not a relevant geographic market in accordance with the EC SMP Guidelines.

4.1.17 Based on our analysis above, CityFibre is opposed to Ofcom using the proposed 65% network reach threshold to determine whether a network is 'present' in a postcode sector. CityFibre believes that a higher threshold would be much more appropriate as it would guarantee more homogenous competition conditions within the resulting relevant market. Ofcom itself refers to the need to effectively reduce the size of the market through the SMP assessment process, to identify the areas that are genuinely effectively competitive. This seems to us to reflect that the market definition criterion was wrong at the outset.

4.1.18 Instead of needing the SMP assessment as part of the market definition process, CityFibre recommends that Ofcom uses a more appropriate network reach threshold, for example the 90% threshold used in past BCMR decisions. A lower threshold should be based on clear analysis that the resulting market would be sufficiently homogenous and sufficiently different from adjacent markets to constitute a relevant market.

4.1.19 The subsequent SMP assessment would then be to determine whether the relevant market as defined is effectively competitive. In this context, we refer Ofcom to section 5 of this response

[18] Although such network can be deployed using BT's ducts and poles, it is still very different from simply using BT's existing copper and simply putting electronics onto the copper connections.

[19] Paragraph 56 of the EC SMP Guidelines.

where we explain that it is important that the relevant unit used for the geographic market definition is sufficiently large to be meaningful for operators deploying networks. A ‘swiss cheese’ approach to SMP within a single town or city is not appropriate will deter investment.

5 Ofcom's approach to planned and potential network rollout

5.1.1 Notwithstanding our comments above on the 65% threshold, we agree with Ofcom that a network should be counted as present in an area when it covers more than the appropriate threshold of premises in the relevant area. In other words, CityFibre agrees that network reach is the correct parameter to analyse when defining the relevant geographic markets.

5.1.2 Whilst CityFibre believes that category 2 is largely self-selecting, that makes the criteria used to define categories 1 and 3 even more important.

5.1.3 Ofcom proposes to use a minimum scale rule to define areas to be included in category 3. However, there may be operators whose business case is built on serving smaller areas than that minimum scale. It is therefore important that Ofcom understands network deployment plans by individual operators. Not doing so could result in inappropriate regulation in areas where operators are willing to make commercial investments.

5.1.4 We agree with Ofcom's statement[20] it should include as planned networks only those where plans are "sufficiently detailed to identify the towns/cities in which they will deploy". A more general statement of intent is not sufficient to consider a network as planned.

5.1.5 CityFibre agrees strongly with Ofcom's statement[21] that, even where network build has started or a business case has been signed-off by the operator, that network should still be counted in "plans" rather than "presence". Even once a network has been completed, the realities of the market means that it takes time for customers to be signed up or migrate from existing networks, which would limit the competitive constraint imposed by a planned network or a network in the process of deployment (or recently completed).

5.1.6 It is important that pro-competition regulatory measures (such as measures to prevent anticompetitive behaviour by BT/Openreach) are retained until such time that competitive operators have had a reasonable time period to gain critical mass. The period just after making significant investments, but before acquiring sufficient customers to create a reasonable return on that investment is when new market entrants are most vulnerable.

5.1.7 We note that Ofcom states in 3.43 that it would consider the whole town/city where the operator's plan is at a higher level and not base the plan on the postcode sector threshold. We refer back to our comment in section 3 above, that presence should be considered based on a cluster of postcode sectors that represent a coherent geographic unit (such as a town or city) of a minimum size of around 10,000 premises, as this would more accurately reflect operators' investment decisions.

5.1.8 As also noted earlier, the availability of DPA has significantly reduced the up-front capital investment associated with building a network in a given geographic area. The sunk fixed cost of civil engineering works can be significantly reduced thus reducing the economic barrier to entry for new networks. This means that operators can enter the market needing a much smaller scale to compete on equal terms with BT. This in turn means that the minimum size of a town or city that forms part of the addressable market is much smaller.

5.1.9 With regard to areas with the potential for future rollout, we generally agree with Ofcom's approach of clustering. However, we consider that the 20,000 premises threshold that Ofcom proposes (para. 3.49) is too high. It is our view that this threshold should be halved to 10,000

[20] See paragraph 3.40.

[21] See paragraph 3.41.

premises as this more accurately reflects the number of properties an operator would need to see in a market to consider it a potential market.

5.1.10 In further support of this view, we note that Table 4.8 shows that at 10,000 premises the total premises in clusters would be 20.9 million. Table 4.9 then shows that the total number of premises including existing presence, planned presence and potential rollout is 20.4 million. This suggests that actual and planned presence extends to areas with fewer than 20,000 premises and is, in fact, closer to 10,000 premises. The empirical evidence therefore suggests that Ofcom has set its threshold too high.

5.1.11 If Ofcom retains its proposed threshold of 20,000 premises then there is a real risk that locations where commercial investment is viable, would be excluded from category 2 and potentially regulated in a fashion that would prevent commercial investment. That would seem to be at odds with Ofcom's stated objectives and also with Government policy, namely to encourage commercial investment in competitive fibre networks wherever possible.

6 Ofcom's approach to competition differences at service level

6.1.1 Ofcom proposes to consider only 'multi-service' networks in its geographic market definition analyses. Ofcom further considers that leased lines-only networks do not qualify as multi-service networks, whereas broadband-only networks do.

6.1.2 Ofcom does not provide much explanation or rationale for this approach. In paragraph 1.12, Ofcom states that leased lines networks are not included, as they do not supply residential services. In paragraph 3.30, Ofcom states "*Some existing networks are service specific, particularly in terms of some networks that provide leased lines services. These networks may develop into multi-service networks in the longer term, but we do not think there is sufficient evidence to assume this will happen in all cases. As such, as a general rule, we do not consider that existing leased lines networks should be considered to be multi-service networks, or to be substitutable for them, unless there is clear evidence to the contrary. Accordingly, when identifying which areas fall into each of the three categories explained above we will not include networks that support only leased lines*."[22]

6.1.3 It appears that Ofcom's rationale is as follows; leased-lines only networks are not present near the majority of residential premises and the additional cost and network deployment to address leased lines customers from an existing broadband network is likely to be substantially lower than vice-versa. In the language of substitutability, it appears that Ofcom considers that there is supply-side substitutability between multi-service networks and leased lines but not vice versa. It is CityFibre's understanding that the product market for which the geographic market analysis is intended, is the market for multi-service networks, although that is not stated explicitly. CityFibre considers that Ofcom should make its rationale and assumptions more explicit.

6.1.4 In order to determine whether Ofcom's proposed approach could cause a problem, CityFibre considers it useful to review whether it would likely result in either Ofcom including areas in Category 1 which should have been included in category 2, had Ofcom measured the presence of both broadband markets and leased lines markets (which we refer to as false positives); or whether Ofcom's approach would likely result in Ofcom including areas in Category 2 which would have been allocated to Category 1 if Ofcom had measured the presence of both broadband and leased lines (which we refer to as false negatives).

6.1.5 The review needs to be made in the light of the fact that the markets for WLA and BC are presently separate and that it is by no means certain that they should be considered a single market, even on a forward-looking basis, when Ofcom performs the next set of market reviews for completion in April 2021. As Ofcom is consulting on the approach to defining geographic markets without first having defined product markets, there are many assumptions that need to be made in order to comment meaningfully on the proposed approach.

6.1.6 It is therefore also necessary to consider that it may well be necessary to impose separate remedies to address competition concerns in the WLA and BC markets, even if the geographic markets defined are the same for both product markets.

6.1.7 Considering first the potential for false positives, that is overestimating competition and therefore potentially under-regulating the relevant geographic market. Given that the geographic market being defined is for the product market of multi-service networks and that Ofcom considers that the presence of leased lines-only networks can be addressed at the remedies

[22] It is interesting to observe that this is the only place in which the consultation refers to multi-service networks, despite our understanding that the geographic market analysis is centred around identifying the presence of 3 or more multi-service networks.

stage, it seems clear that, if leased lines are not classed as (or substitutes for) multi-service networks, then the exclusion of leased lines-only networks should not result in areas being classified as category 1, which would have been classified as category 2 had leased lines-only networks been included. This is because the addition of the leased lines-only networks can only increase the level of network presence so, if BT is found to not have SMP when considering multi-service networks only, then it would also not have SMP if both multi-service and leased lines-only networks were considered.

6.1.8 With regards to false negatives, that is underestimating competition and potentially over-regulating the relevant geographic market. As leased lines-only networks are not considered to be (substitutes for) multi-service networks, there could be situations where the classification of an area, using the multi-service network presence only as the measure, results in that area being classified in category 2, but where, in fact, there is already effective competition in the leased lines market. Such an area may exist in the central London area (the CLA), where several competing networks address the leased lines and dark fibre market.

6.1.9 Ofcom proposes that the impact of the false negative can be addressed at the remedies stage. The false negative would mean that BT was found to have SMP in the relevant geographic market for multi-service networks, even though it may in fact not have SMP in the leased lines market.

6.1.10 CityFibre agrees with Ofcom that it would be possible to overcome the false negative by disapplying any leased lines-specific remedies in the relevant geographic market, or subset of the relevant geographic market. This would, however, require that Ofcom undertakes postcode sector-level analysis within the relevant geographic market to identify where leased lines-only networks are present. Whether this then results in defining smaller geographic markets for leased lines-only networks, or just the application of different remedies within the same geographic market would be up to Ofcom[23].

6.1.11 CityFibre, however, believes that the 'one-size-fits-all' approach to market definition and (therefore by implication) SMP analysis, can result in either less differentiation between different levels of competition in the leased lines market (even though SMP may exist in both the broadband and the leased lines market, the differentiation in competition in the leased lines market is often more nuanced that in the broadband market), or substantial analysis being required in a number of different location across the country to ensure that the appropriate remedies are applied in different parts of the country. At this time, it is not clear that the benefits of defining common geographic markets for the WLA and BC markets (Ofcom has not yet explained what it considers the benefits to be), can outweigh the rather complex and iterative approach proposed by Ofcom in this consultation.

6.1.12 CityFibre believes that it may be better for Ofcom to conduct the three market reviews separately from the start and then combining the WLA and BC markets only if the analysis shows that the two markets either have merged, or are likely to merge during the review period[24]. It is CityFibre's views that the benefits from doing simultaneous reviews of the three markets, and ensuring that remedies applied do not cause market distortions or provide perverse investment incentives to BT and competitive operators, are very substantial. We are not certain that any

[23] See paragraph 50 of the EC SMP guidelines: If regional differences are found, but not considered to be sufficient to warrant different geographic markets or SMP findings, NRAs may pursue geographically differentiated remedies (43). The stability of the differentiation — specifically the degree to which the boundary of the competitive area can be clearly identified and remains consistent over time — is the key to distinguishing between a geographical segmentation at market-definition level and remedy segmentation.

[24] To a sufficient extent to a single/combined market review

incremental benefits from partially or wholly combining the WLA and BC market reviews outweigh the apparent complexity exposed by this consultation.

7 Ofcom's illustrative assessment

7.1.1 CityFibre has reviewed Ofcom's illustrative example and found it very helpful in our analysis of the proposals in the consultation. All relevant comments on the illustrative example are contained the preceding sections of this response.

SPC Network

8 Annex A – Boundary test for geographic markets

SPC Network

Report for CityFibre

Boundary Test for Geographic Markets

25 February 2019

SPC Network

Chapel House

Booton

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About SPC Network

SPC Network was founded in 2003 and has worked for over 30 clients worldwide. We undertake Strategic Policy Development for clients in platform and networked industries, by combining the knowledge of our consultants with specific and valuable skills to ensure rigorous analysis and exceptional advice. Our core consultancy team and network of partners have substantial experience in industry and consulting and so we understand the practical issues and challenges facing the market. Through advanced academic training, we have developed the key skills and rigorous approach needed to support our clients win the policy debate.

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introduction

8.1.1 In December 2018, Ofcom published its Promoting investment and Competition in Fibre Networks: Approach to Geographic Markets Consultation (geographic markets consultation).

8.1.2 At paragraph 2.15, Ofcom states that it expects to define geographic markets into three categories:

- Category 1: competitive areas
- Category 2: potentially competitive areas
- Category 3: non-competitive areas.

8.1.3 Category 1 markets are defined by Ofcom as areas where there are at least two other operators in addition to BT supplying ultrafast broadband and leased line services (para. 2.17). However, the geographic markets consultation does not provide any economic evidence as to why Ofcom has chosen the presence of at least two other operators as the appropriate demarcation between competitive and potentially competitive areas.

8.1.4 CityFibre has asked SPC Network to provide a short report summarising relevant economic research, including recent merger, cases on the number of firms required to create a competitive market, and whether this research supports Ofcom's view.

8.1.5 Overall, the research indicates that Ofcom has drawn the boundary between competitive and potentially competitive areas in the right place: that is say that, subject to other factors, a market of three firms has been found to be competitive in many markets, whilst a market with only one or two firms is very unlikely to be competitive. This report, therefore, concludes that the literature supports Ofcom's findings.

Summary of the literature

8.2 Theoretical Models

8.2.1 The question of how many firms create a competitive market has been explored in both theoretical and empirical literature for many years. At one extreme is the position taken by Baumol (1982) that the presence of just one firm can result in competitive outcomes if the market is "perfectly contestable[25]. Such a market would need to have the following characteristics:

i. All producers, actual and potential, have access to the same technology;
ii. Where economies of scale exist, fixed costs are not sunk expenditures;
iii. There is no entry lag. An entrant can enter and instantaneously produce at scale; and
iv. The incumbent's response time is greater than the exit time for the entrant[26].

8.2.2 The third of these characteristics implies that consumers face no switching costs and can switch instantaneously from one supplier to another.

8.2.3 Two famous theoretical models of duopoly (Cournot and Bertrand) come to different conclusions[27]. The Cournot model, in which the firms simultaneously choose levels of output given what they conjecture about the output of their rival, predicts that duopoly output is greater than would be found under monopoly but less than under perfect competition. Under the Bertrand model, however, each firm chooses a price given the expected reaction of the other and predicts that prices will be set at marginal cost, as would be the case under perfect competition[28].

8.2.4 Under Cournot, therefore, two firms are not enough for a competitive outcome, whilst under Bertrand they are enough.

8.2.5 Huck, Normann and Oechssler (2004)[29] build on previous game theoretical models, notably Selten (1973)[30], and conduct an experiment to establish how the number of firms

[25] Baumol, W. (1982) *Contestable Markets: An Uprising in the Theory of Industrial Structure* American Economic Review 72: 1 - 15

[26] Church, J. R., & Ware, R. (2000). *Industrial organization: a strategic approach* (pp. 367-69). Boston: Irwin McGraw Hill, pp 507 – 508.

[27] Ibid, pp233 – 270 for an explanation of the models.

[28] The model also assumes that the two firms produce the same product and have the same constant marginal cost.

[29] Huck, S., Normann, H. T., & Oechssler, J. (2004). Two are few and four are many: number effects in experimental oligopolies. *Journal of Economic Behavior & Organization*, *53*(4), 435-446.

[30] Selten, R. (1973). A simple model of imperfect competition, where 4 are few and 6 are many. *International Journal of Game Theory*, *2*(1), 141-201.

in a market affects competition. In particular, they consider how the number of firms in the market facilitates collusion or competition. They review a number of previous articles in which researchers have used Cournot models with between two and five firms. Their first conclusion from these papers is:

Previous studies indicate that collusion sometimes occurs in duopolies and is very rare in markets with more than two firms. On average, total outputs in markets with more than two firms slightly exceeds the Cournot prediction. There is a weak trend suggesting that this effect may become stronger as the number of firms increases.

8.2.6 After reviewing previous models, they conducted their own experimental games in which subjects had information about the cost and demand conditions so that they could calculate best replies to quantities of the other firms.

8.2.7 Huck et al's conclusion from their experiments was that while duopolies manage to collude (and so set quantities below the competitive level)

"…this seems to be difficult to achieve in markets with more firms. In fact, total average output often exceeds the Nash[31] prediction in those markets. Furthermore, the data suggest that these deviations are increasing in the number of firms. "

8.2.8 Hence the title for their article that two firms are few, and will result in collusion, whilst four are many and unlikely to do so.

8.3 Empirical Models

8.3.1 In their seminal article, Bresnahan and Reiss (1991)[32, 33] sought to explore empirically the effect of entry on competitive outcomes and how many firms were needed for a market to be competitive, albeit imperfectly. They develop an empirical model of market entry which estimates how many competitors are needed, given the market size (number of people) to reduce profits from the monopoly level to zero, i.e. where price equals marginal cost. Ideally, they would like to observe how quickly price cost margins fall as the number of competitors increase. However, they say that such empirical data are not often observable and so they develop entry thresholds to draw inferences about margins.

8.3.2 he entry threshold ratio measures the fall in variable profits per customer between a monopoly and a competitive market. Entry by the second through to n^{th} firm moves the price cost margin much closer to that which would be found in a perfectly competitive market than in a monopoly. In a perfectly competitive market, the entry threshold ratio would equal one.

[31] The Nash Equilibrium in a concept central to game theory that characterises an outcome whereby all participants are pursuing the best possible strategies given the strategies of all other players.

[32] Bresnahan, T and Reiss, P (1991) *Entry and Competition in Concentrated Markets* The Journal of Political Economy, Vol. 99 No. 5 (Oct. 1991) pp 977 – 1009.

[33] Google Scholar shows this article as cited over 1,500 times (14 January 2019)

8.3.3 The model is tested using data from various retail service markets (doctors, dentists, etc.) in 202 isolated (from each other) local markets.

B&R conclude:

> *"Our econometric estimates of entry thresholds for five different retail and professional industries confirm our initial hypothesis that post entry competition increases at a rate that decreases with the number of incumbents….most of the increase in competition comes with the entry of the second and third firm. These results initially surprised us. We expected to find entry threshold ratios that declined more gradually. It instead appears that the competitive effects of entry occurs rapidly". (our emphasis)*

8.3.4 B&R do not refer to entry into an existing monopoly market, but to entry where there is no existing supplier. Thus their reference to "entry by the second or third firm" refers to the presence of two or three suppliers in the market in total.

8.3.5 Xiao and Orazem (XO) [34] explored entry and competitive effects in the USA broadband market. Their article concludes:

> *"Once the market has one to three firms, the fourth entrant has little effect on competitive conduct in the local broadband market. The conclusion on broadband markets is therefore in line with that of Bresnahan and Reiss' conclusion of local service markets."*

8.3.6 The XO paper examines the conditions in which there is net entry and exit in local broadband markets, based on zip codes, at the time that broadband markets were growing rapidly in the USA. Their model is based on Bresnahan and Reiss, whose methodology XO describe as "enormously influential in the field of empirical industrial organisation", but specifically considers the decision of a firm to enter the market and the presence of sunk costs[35].

8.3.7 A potential entrant enters the market when its expected discounted value of future profits exceeds its sunk costs of entry. Therefore, demand and profits have to be sufficiently high to allow the entrant to cover those sunk costs.

8.3.8 In the XO model, the variable s^n represents the amount by which the population of a zip code area must increase to support the entry of the n^{th} firm. It then takes an additional s^{n+1} to support entry of the $n^{th}+1$ firm. If the population increase necessary to induce the second firm to enter is four times the population necessary to induce the first firm, then firms' variable profits and competitive conduct must have changed dramatically in moving from monopoly to duopoly. The entry threshold ratio $s^{(n+1)}/s^n$ measures the change in competitive conduct as the market changes from *n* firms to *n+1* firms and is close to unity if there is no change in competitive conduct.

[34] Xiao, M. and Orazem, P.F. (2011) 'Does the fourth entrant make any difference: Entry and competition in the early U.S. Broadband Market' in *International Journal of Industrial Organisation* No.29 547 - 561

[35] XO point to three sunk costs: incumbents' strategic behaviour; consumer switching costs; and surrendering of an option for later entry "under less-than-perfectly predictable market conditions".

8.3.9 XO produce models when entry involves sunk costs and when it does not involve sunk costs. In the results of both model $s^{(n+1)}/s^n$ is found to be close to unity when s>4 with only a slight increase over time. However, in the sunk cost model XO find that s^4/s^3 is close to unity with small deviations over time. Sunk costs are defined as "irreversible, unrecoverable, direct investment costs for entrants to start a business". These costs were abstracted away in the Bresnahan and Reiss article and their inclusion is, therefore, one of the ways in which XO take forward this analysis. As sunk costs are significant for any entrant in the broadband market, then a model including sunk costs is a better approximation of reality.

Commenting on this result XO state:

> *"Therefore, though we are not able to infer that competitive conduct change inside the 1-to-3 firm category due to data limitations, we are safe in concluding that the fringe players from the 4th firm on have little effect on the competitive conduct of the broadband market".*

8.3.10 In summary, in a market where there are sunk costs of entry, a market structure in which there are just three firms is probably sufficient to create a competitive market. The fourth firm has little or no additional effect.

8.4 Merger Cases

8.4.1 In this section, we review a number of merger cases and what they tell us about how competition authorities view the number of competitors needed for a competitive market.

8.4.2 In 2003, the Competition Commission (CC) reviewed a proposed supermarket merger. Asda, Morrisons, Sainsburys and Tesco were all bidding to acquire Safeway and the Secretary of State at the time referred the case to the Competition Commission (CC)[36]. The salient point in relation to this case is that whilst Morrisons was cleared to buy the Safeway chain, in some geographic areas it was required to sell Safeway stores because it would otherwise have too large a market share within those geographic areas.

8.4.3 In an informal article[37] Prof. Stephen Davies, of the University of East Anglia Centre for Competition Policy (then the Centre for Competition and Regulation), assessed the CC's decision. He inferred that the CC found that an effectively competitive market occurs when there are between three and four firms in that market.

8.4.4 Three recent merger cases in electronic communications are relevant. In the H3G/Wind[38] joint venture case, The European Commission approved the joint venture conditional on the divestment of specific assets that would allow a new Mobile Network Operator

[36] Competition Commission (2003) Safeway plc and Asda Group Limited (owned by Wal-Mart Stores Inc); Wm Morrison Supermarkets PLC; J Sainsbury plc; and Tesco plc: A report on the mergers in contemplation

[37] 'How many sellers do we need for effective competition?' CCR Newsletter, Issue 5, November 2003

[38] Case M.7758 — Hutchison 3G Italy/WIND/JV

(MNO) to enter the market. Specifically, the JV had to release certain spectrum for a new operator. Subject to such entry, the market would remain a four operator mobile market.

8.4.5 In the second case, Three/O2[39], the Commission blocked the merger on the basis that it would lessen competition in the market. Specifically, the Commission was concerned that the merger could lead to "horizontal non-coordinated anti-competitive effects"[40], i.e. tacit collusion between competing firms to the detriment of consumers. The UK, therefore, remained a four operator market.

8.4.6 More recently, in November 2018, the Commission unconditionally approved the acquisition of Tele2 Netherlands by T-Mobile Netherlands[41], despite the fact that this would reduce the number of MNOs in the Netherlands to just three.

8.4.7 The Commission considered that the effect of this merger was unlikely to lead to significant price increases given that the merged entity would remain the smallest player in the market and that the increase in T-Mobile's market share would be small, at just five percentage points. The Commission also considered that the other two mobile operators (KPN and Vodafone) pursued different strategies and so the merger would be unlikely to lead to coordinated effects between the three parties. Finally, the Commission did not regard this merger as causing a risk to MVNOs and so would have little, if any, effect on the retail market.

8.4.8 These three merger cases indicate that the Commission does not see any *per se* bar to four to three mergers, even if, as BEREC suggests[42] a careful approach should be taken. In other words, the Commission does not consider that four is a magic number, below which markets would not be competitive.

Conclusion

8.4.9 In this short report, we have discussed some of the theoretical and empirical literature, and some relevant merger cases, where the number of firms in a market has been deemed important. The theoretical and empirical literature point to a minimum of three firms being required for a competitive market and the addition of a fourth firm may have little marginal competitive impact. This literature is reflected in decisions of competition authorities, which have allowed four to three mergers where such a merger is unlikely to have an anticompetitive effect.

8.4.10 We conclude from this analysis that Ofcom's setting of three operators in a geographic market as a boundary between a competitive and a potentially competitive area is in line

[39] Case M.7612 — Hutchison 3G UK/Telefónica UK)

[40] ibid para. 1116

[41] Case M.8792

[42] BEREC (2018) *Report on Post-Merger Market Developments - Price Effects of Mobile Mergers in Austria, Ireland and Germany*

with recent theory and practice. However, we are also of the view that three firms does not automatically indicate a competitive market and a proper assessment of the presence of Significant Market Power (SMP) in such areas still needs to be conducted, as Ofcom indicates.