TalkTalk

For Everyone

Promoting investment and competition in fibre networks: modelling the cost of a fibre network

TalkTalk submission

August 2019

1   Summary

1.1   This submission responds to Ofcom's consultation paper, dated 21 June 2019, entitled *Promoting competition and investment in fibre networks: Initial consultation on the approach to modelling the costs of a fibre network*.

1.2   TalkTalk warmly welcomes this consultation. As we set out in our June 2019 response to Ofcom's remedies consultation in the context of the Access Review, Ofcom's approach in this review to date has been notable for the absence of evidence deployed by Ofcom in reaching its proposals. The remedies consultation itself was the apotheosis of this, setting out detailed remedies with no evidence, analysis or argumentation whatsoever, with Ofcom simply asserting what was appropriate.

1.3   This review, and the modelling work which is anticipated to be undertaken following it, appears to be a welcome return by Ofcom to assessing evidence before deriving proposed remedies. It is essential that Ofcom develops a properly calibrated and sufficiently detailed model of FTTP costs, and then uses this, along with other evidence and reasoning to determine what remedies to adopt (and particularly the level of any charge control). It is therefore unfortunate that Ofcom has chosen to issue this consultation only after its initial consultation on remedies.

1.4   Ofcom should be clear about the purpose of its modelling and how it expects to use this evidence since it will affect the appropriate approach to estimating FTTP network costs. We consider that Ofcom should use the cost estimate to determine the REO cost for FTTP networks in the different geographic markets which it defines, and then, in areas where altnet FTTP investment has occurred, set the price cap for MPF/FTTC based on the REO cost. This is in line with the approach set out in TalkTalk's remedies submission.

1.5   At a high level, the proposals on modelling generally appear well conceived and appropriate. However, in the more detailed proposals there are a number of issues that Ofcom should address in its model construction:

- it should ensure that the model retains sufficient flexibility to take into account any changes in Ofcom's market definitions and market power assessments in the period until March 2021;

- it should not assume a particular business model by operators. In particular, it should not assume that all operators offer both leased lines and residential lines, and particularly should not assume that altnets are willing to provide dark fibre or duct access, both of which are likely to be uncommon products;

- Ofcom should amend its approach to determining which areas are prioritised for altnet FTTP to be based on a broader set of factors than the current proposal to solely consider the cost of roll-out, without any reference to demand-side factors.

2   General approach

2.1   Ofcom sets out its general approach to modelling in section 2 of its consultation. This section responds to the points raised therein.

2.1   Bottom-up approach to modelling

2.2   TalkTalk agrees that Ofcom should adopt a bottom-up approach to modelling the costs of deploying an FTTP network. There are several reasons for this conclusion:

- we agree with Ofcom's statement that a bottom-up approach provides greater flexibility to assess costs across different geographies and for different scales of deployment;

- we agree that it would be difficult to adopt a top-down modelling exercise at present, given the absence of a large-scale or mature FTTP network and the consequent difficulties about determining appropriate AVEs and CVEs;

- we agree that it would be sensible to calibrate the bottom-up modelling based on providers' actual costs and business plans, provided that these are not distorted by regulatory gaming.

2.2   Services and network scope

2.3   TalkTalk agrees with Ofcom's proposal to model networks on the basis that they will offer FTTP/GPON based broadband services to domestic and business consumers.

2.4   Ofcom is proposing to assume that all FTTP networks will offer leased lines. However, it does not yet appear clear that all altnet FTTP networks will offer point to point dedicated leased line services using ethernet, WDM or dark fibre. [✂] CFH appears to be the only extant FTTP network offering leased lines over its network and only seems to serve part of the market– smaller businesses and the public sector. There are a number of reasons as to why altnet FTTP networks do not generally provide leased lines (or only serve part of the market) including: the need for significant additional investment since businesses are located in different geographic areas from residential customers; high customer inertia and thus slow take-up; and, particularly for larger business customers, the need for an extended track record of success. It is not clear that these factors (and therefore altnet FTTP network strategies) will change in the future.

2.5   Ofcom should therefore construct its model in a way which makes it easy to adjust in the case that the majority of networks do not choose to offer leased line services. Ofcom will not need to settle on its final proposals for well over a year, and it may be that in the intervening period it becomes clearer whether providers will generally offer leased line services or not. Ofcom should retain the flexibility to amend its modelling, at some point in 2020, such that FTTP networks do not offer leased lines.

2.6   Even if an altnet FTTP network were to offer point to point dedicated services it is likely in many cases that they would not offer dark fibre, and instead would only provide Ethernet and WDM services. This is because if the market is not fully competitive, providers will in general prefer selling downstream products – although CityFibre offers dark fibre. This can be seen in the market today where the two largest providers – BT and Virgin – do not offer

dark fibre, even in areas where there are three or more competing operators such as central London. [✂]

2.7 Similarly, although Ofcom may wish to ensure that its model has the flexibility to model altnets offering duct and pole access (albeit such flexibility is not proposed at present), it should not assume that any networks offer these services. [✂] Unless Ofcom can demonstrate that, at least, some operators have explicit plans to offer DPA, or have built revenues from offering DPA products into their business plans, then it should not base any of its modelling results on the revenues derived from DPA.

2.3 Network coverage

2.8 TalkTalk agrees that it is appropriate for Ofcom's model to have the flexibility to estimate the costs of either national or subnational FTTP networks.

2.9 However, Ofcom's proposal that only postcode sectors should be used for geographic modelling is concerning. TalkTalk has previously set out, in its March 2019 consultation response, its view that postcode sectors are insufficiently granular to properly model FTTP networks, as conditions of competition may not be sufficiently homogeneous across the whole of a sector. By constructing a model which only has the capability to deal with postcode sectors as the appropriate geographic unit, Ofcom makes it more difficult to amend this geographic market definition, even if it wishes to undertake further consultation. Ofcom should therefore amend its modelling approach to ensure that the model is as flexible as possible to deal with potential changes of geographic unit later in the review process.

2.4 Scorched node/ scorched earth approach

2.10 TalkTalk agrees that it is appropriate for Ofcom's model to be capable of supporting both a scorched earth approach and a scorched node approach, as both approaches to modelling may be informative for different ways in which the model's outputs could be used.

2.5 Network design approach

2.11 Ofcom is not explicit about what network design it is assuming but it appears to be a 'dense' network where the operator constructs network in advance to the curtilage of each premise where it installs a breakout point. When the customer subscribes to a service then a connection is constructed from the breakout point to a point within the premise.

2.12 We consider that this is appropriate for GPON / broadband services provided to residential and smaller business customers. It is the approach being adopted for these services by the main altnets such as CityFibre and Gigaclear.

2.13 However, it is unlikely to be the appropriate approach for providing leased line services. This is because the penetration rate a provider can achieve for leased lines is lower and therefore they tend to construct a less dense network with fewer breakout points– a provider will often connect to the outskirts of a business area but not build into it until it has firm orders.

2.14   Ofcom should also assume that the GPON network of an FTTP operator will cover MDUs. Although not all altnets currently serve MDUs, this is likely to change over time as network builders become more familiar with the requirements to serve MDUs, as such buildings have been one of the main drivers of FTTP rollout in continental European countries.

2.6   Reuse of existing physical infrastructure

2.15   TalkTalk agrees that it is appropriate that Ofcom's model contains functionality to allow any mixture of reusing existing physical infrastructure and building new physical infrastructure. This reflects real world situations, where altnets will adopt different approaches from one another, and indeed where the same altnet may adopt different approaches in different geographic areas.

2.16   Ofcom's base case assumption – that an FTTP network will reuse existing physical infrastructure where it is available, and will only build new physical infrastructure where this is not available – is appropriate, but only when applied to BT Openreach's physical infrastructure, which has an access obligation and price cap applied to it. For other existing or new operators' infrastructure, as pointed out at §2.7 above, there should be no assumption that they will make their duct assets available, and therefore it would be inappropriate to take such access as a given.

2.17   Similarly, Ofcom should not assume that assets from firms operating in other industries (such as water and gas pipes) are usable and practicable, even in the presence of the civil infrastructure directive. There have been no instances where such passive infrastructure is used at scale, and Ofcom should not assume that it will be used at scale during the next control period.[1]

2.7   Approaches to model verification

2.18   TalkTalk agrees that it will be important for Ofcom to verify its model, and that the availability and quality of data must ultimately inform the approach to calibration and cost verification (§2.26 of the consultation).

2.19   The best source of data for Ofcom to calibrate its model will be data provided by Openreach and other telecoms operators which are deploying FTTP networks (and leased line networks) in the UK. These data have the advantage that they are based in the real world, and reflect contemporaneous experiences around the UK. However, care must be taken that operators do not game these data to increase (or decrease) the REO cost modelled by Ofcom. Ofcom should verify the overall business plans against more detailed underlying data, such as invoices, and audited data to ascertain that operators are not gaming Ofcom's modelling.

2.20   An alternative is international comparison data. However, the quality of analysis obtained by calibrating model results against data from other counties is likely to be considerably lower than calibrating against UK data. There are likely to be numerous differences between other EU Member States and the UK, including:

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[1] This is in line with the analysis presented by Ofcom at §3.60 of the Passive Infrastructure Market Review, which found that non-telecoms infrastructure does not represent a viable alternative to telecoms infrastructure when deploying networks.

- they may have different planning regimes, which impact the costs of liaising with councils, the cost of lane rental charges, and the need for precise planning well into the future;

- labour costs and laws are likely to be different;

- the proportion of multi-dwelling units is likely to be different; and,

- exchange rate fluctuations mean that sterling-denominated costs can change considerably in a short period of time.

2.21 Ofcom should therefore be cautious about placing any weight on international comparison data, which is unlikely to be informative other than in specific cases (for example, the cost of a particular item of internationally traded equipment). In order to calibrate its model, Ofcom should primarily rely on data from UK-based networks.

3   Service volume forecasting

3.0   Deployment scenarios

3.1 Ofcom's approach of allowing multiple scenarios of network coverage and speed of deployment for FTTP networks, which can vary by operator, is appropriate. It is likely that operators will adopt different strategies for roll-out, and it is important that Ofcom's model has sufficient flexibility to deal with all these strategies.

3.2 TalkTalk also agrees that the model should exclude premises which are state funded, and that it is appropriate to exclude from roll-out the premises with the highest cost per home passed. However, we consider that 10% of premises is likely to be less than the proportion of the country that requires state aid, and that state aid is likely to be required in a far wider proportion of the UK than this in order to meet the costs of roll-out. It is notable in this regard that the BDUK subsidy scheme– which subsidised a much lower incremental cost per home covered– subsidised around 15%-20% of UK premises, and did not cover much of the hardest to reach 5% of the country. This means that 20-30% of UK premises is a reasonable first order proxy for the proportion of the UK which is likely to require subsidy for FTTP construction, and should therefore be excluded from the modelling.

3.3 However, the proportion of the UK which will need state subsidy remains somewhat unclear at present, albeit that it can be known with a high degree of certainty that 10% is too little of the country. This replicates the errors of DCMS in the Future Telecoms Infrastructure Review, which has overestimated the extent to which commercial roll-out is likely to be viable. Ofcom should therefore leave it flexible for now, but consult widely across the industry regarding the proportion of premises which are likely to require subsidisation.

3.4 TalkTalk agrees that it is appropriate to allow the ratio of leased lines to access lines to vary in different areas of the UK. This ratio is likely to be materially different in central business districts of major cities from suburban areas. However, in line with TalkTalk's comments in section 2 of this submission, we do not expect that every FTTP operator will choose to provide leased line services, and the model should allow for the flexibility for there to be no leased line services offered at all in a particular area.

3.1 Take-up profiles

3.5 Ofcom's assumption that maximum take-up is achieved within ten years of roll-out is appropriate. [✂]

3.6 The proposed approach of allowing different penetration profiles for leased lines from access lines is also appropriate. Penetration levels for leased lines are generally lower than for broadband networks, as seen by the low market shares obtained by leased line networks in the CLA, compared to the higher broadband market shares gained by Virgin Media in its areas and the rapid takeup achieved in areas of FTTP rollout by operators such as CityFibre and TalkTalk.

3.2 DPA and dark fibre volumes

3.7 If Ofcom wishes to model passive service volumes (and, as set out earlier in this submission, it is unclear that it needs to, given that these services are unlikely to be offered by most operators), then it is appropriate to model them distinct from active service volumes.

3.8 However, its assumption that there are no cannibalisation effects (§3.18) is inappropriate. The most important case of this is in BT roll-out of its FTTP network, where there will be a clear cannibalisation of active volumes by passive products. In a situation where BT has an existing FTTC and leased line network, there is no plausible case to argue that FTTP services will not cannibalise at least this network.

3.9 With respect to DPA volumes, TalkTalk is unclear what Ofcom is proposing. Ofcom states (§3.19) that:

> *We propose to model DPA volumes as the number of end customers that are served using DPA services provided by the modelled network*.

3.10 This appears to be a tautology– that Ofcom proposes to model DPA volumes as the volume of DPA. It is therefore unclear to TalkTalk what exactly Ofcom is proposing. It would be helpful if Ofcom could provide more detail on this, as it appears to TalkTalk to be particularly difficult to model DPA volumes, given the lack of any existing market to base estimates off. For the avoidance of doubt, TalkTalk considers that the most appropriate estimate of DPA volumes is zero.

3.11 The proposals for modelling dark fibre, with three scenarios, including one where dark fibre is not provided at all, seem appropriate.

3.3 Relationship between rentals and ancillary services

3.12 TalkTalk agrees with Ofcom's proposal to model ancillary service volumes based on actual and forecast data provided by FTTP network operators. However, it is important to reflect that not all ancillary services are driven by rental volumes. For example, although interconnection links will be related to the installed customer base connection volumes will be driven by new customers and migration volumes by churning customers. The relationship between the installed base, new customers and churning customers will not be constant over the lifetime of a network, but rather will vary in a systematic manner.

4 Network dimensioning and costing

4.0 Network dimensioning

4.1 Ofcom proposes to rank postcode sectors according to their cost of deployment, and then assumes that deployment happens in sequence from lowest cost to highest. This is clearly a simplification of the real structure of deployment, which depends upon several factors other than the simple cost per premises passed (notably the support provided by the local authority, which is helpful in achieving a smooth deployment. As such, Ofcom should look to determine if it can create a more sophisticated model in this regard, which allows for factors other than the cost per home passed to be taken into account to reflect where altnets will build networks.

4.2 The work previously presented to Ofcom by SPC and DAS on behalf of TalkTalk, CityFibre and Vodafone, offers a method by which Ofcom can model the sequence of deployment in a more sophisticated and realistic manner. SPC's modelling sets out a wide range of factors which will combine to determine the attractiveness of an area, including:

- whether Openreach has built an FTTP network in the area already (or has plans to do so in the near future);
- the presence, or absence, of Virgin Media from an area;
- the number of customers served by operators other than BT Retail and Virgin Media;
- the availability of DPA in the area;
- the presence of pre-existing altnet assets; and,
- good build relationships with the local authority.

4.3 Ofcom should adopt a model based on SPC's proof of concept when determining which areas will see FTTP investment. This will create a more accurate estimate than the current one, which ignores demand side factors entirely, focussing on a single supply-side metric.

4.4 These estimates of the relative attractiveness of different areas for FTTP build can be combined with estimates of industry capacity in terms of labour and other resources. Doing this will enable Ofcom to estimate which areas will experience FTTP build during the course of the control period and which areas, even of those potentially eventually viable for FTTP, will not see build until after 2026. This would enable Ofcom to refine its category 2 definition to better reflect the actual areas which are likely to see rollout in the next control period.

4.5 TalkTalk agrees, within the context of a model which is no more granular than postcode sectors, that it is appropriate to dimension FTTP networks at a national level first, before splitting this amongst various areas (§4.11 of the consultation). However, a preferable approach would be to construct the model so that it can achieve greater granularity than postcode sector level, which would be an alternative manner of avoiding double counting, but which would not create inaccuracy in subnational cost levels.

4.6 TalkTalk agrees with Ofcom's proposals regarding dimensioning the leased line elements of FTTP networks, and in particular with the assumption that leased lines are always provided over separate fibres from those carrying FTTP services. This will increase build costs since larger ducts will be required and ducts may need to be deeper. Ofcom should also reflect

that the cost of connecting leased line customers is higher than connecting broadband customers for several reasons: the dig distance is higher since leased line networks are less 'dense' (see §2.13 above); the cost of breaking into a building is often higher (typically £1,300 – see BCMR vol 2 Fig 6.1); and, the cost of terminating the fibre is higher as it requires a more skilled engineer.

4.7 Ofcom's proposals on DPA dimensioning appear strange, as they are unlikely to accurately reflect the behaviour of operators. Ofcom appears to be adopting a modelling assumption that new FTTP networks will be specifically dimensioned to allow DPA products to be offered. In reality this is unlikely; rather, they will be dimensioned for active services, with DPA provision being at most a side effect of unused capacity from overproviding capacity for active products. Given that no altnet has yet shown any interest in offering DPA, it is unrealistic to assume that network build will be amended to allow greater volumes to be provided. It would be more appropriate for Ofcom to model such that it is dimensioned solely to allow active services at the lowest possible cost, with DPA only being offered when there is spare capacity as an inadvertent part of offering active products.

4.8 Ofcom's proposals to dimension networks to offer DPA, in a situation where DPA product volumes for providers other than BT are likely to be nil, will artificially inflate the cost of a new altnet FTTP network, and so will bias upwards the costs of other products.

4.9 TalkTalk agrees that it is appropriate for Ofcom to model whether new infrastructure will be required, or whether DPA from BT can be used to provide parts of the network (§4.18). The assumption that regulated DPA will be used where possible is the best assumption available, given the sometimes large cost savings available to network builders through using DPA.

4.10 In addition, when modelling use of DPA, Ofcom must ensure that its various projections are consistent with one another. Ofcom has set out in various of its documents and consultations that it expects DPA will meaningfully lower the cost of rolling out FTTP networks. This should be fully taken into account when determining the cost of altnet FTTP build, although it will not impact the cost of build for Openreach.

4.1 Network costing

4.11 An important issue which Ofcom has neglected to cover in its consultation paper is that of the calculation of network capex, which it has elected not to consult on, but rather provide an attached Cartesian report. However, this report is also not itself a consultation document, but rather is a report on the methodology of a pre-existing model. It is therefore unclear whether Ofcom is even open to receiving comments on this Cartesian model, let alone able to amend the model in light of comments.

4.12 However, there are a number of points which can be made about Cartesian's proposed approach:

- Cartesian proposes to adopt an assumed 1:32 split for all premises (§4.5) other than some in Category 3, based on Openreach's July 2017 consultation. However, as this model is attempting to determine the REO cost for an entrant, rather than Openreach's cost, Openreach's consultation is not particularly relevant. Cartesian should therefore ensure that its model can be flexible to different splitter ratios. For example, on business parks an entrant may choose to adopt a lower split ratio, to

offer a business grade service to customers. Cartesian's model should be able to adjust to this strategic decision.

- many errors in Cartesian's model may come from the inputs (the 'Service Demand Profile' and the 'Coverage profile') provided by Ofcom. In particular, as set out above, Ofcom's coverage profile appears likely at present to be wrong, given its simplistic univariate nature.

- at §6.1 of its paper, Cartesian sets out that '*all services use the same passive infrastructure routes (ducts and poles). This is an approach which operators are expected to use in a hybrid residential/business network deployment. As a result of all services using the same passive infrastructure, there is only one set of geospatial parameters*'. What this means is somewhat opaque. However, it is likely both that the mix of ducts and poles will differ between areas, and that it will differ between operators. Importantly, it cannot be assumed that all operators will deploy a hybrid residential/ business network– some may choose to only offer services to either residential or business customers. Cartesian's model should be able to cope with these different strategies, or it may yield seriously inaccurate results.

- at §6.37, Cartesian notes that it uses the postcode centroid to locate various business premises when building its model. This is far from ideal. As previously noted in the course of the BCMR by Ofcom, this can lead to overestimates of the distance between the business and the nearest break-out point or cabinet, which are likely to be located close to the businesses which they serve. As such, Cartesian's proposals appear likely to overestimate the costs of an altnet network serving businesses. Cartesian should therefore seek more accurate data which would enable it to ascertain the precise location of businesses, rather than relying on estimates with a significant error to them.

4.13 Ofcom is proposing to adopt a simplified approach for repair, power, maintenance, systems and general management, modelling these costs as a proportion of the Gross Replacement Cost (GRC) of the underlying network assets (§4.22(a)). This will only be appropriate if this proxy is reasonably accurate, and Ofcom has presented no evidence in support of how accuracy the proxy will be in practice. It may be that GRC is not an appropriate metric to use for some elements. For example, repair costs may reflect the number of users rather than the GRC of the network.

4.14 Before adopting this simplified approach, Ofcom should obtain data (both historical and business plan data) from altnets to demonstrate that the ratio between these operational costs and GRC is reasonably constant over time and between operators and between different types of network at different levels of maturity. If it is, then this would appear to be an appropriate approach to adopt. On the other hand, if the ratio differs substantially, then this approach is unlikely to be appropriate, and Ofcom should reconsider its proposals in this regard. We note that at §4.23 Ofcom states that in the 2018 WLA it found that the ratio was reasonably stable at around 9%. However, footnote 16 indicates that this work has not been undertaken for FTTP networks, and it is important that Ofcom ascertains that it is also stable within and across different FTTP networks. We also note that, as fault levels will be much lower for FTTP networks than for FTTC networks, comparisons drawn from FTTC networks are unlikely to be informative for determining the correct relationship between gross

replacement cost and repair costs for FTTP.[2] This is particularly important given that FTTP networks may operate at very different scales, whereas the scale of the Openreach network is essentially fixed over time, covering all UK premises.

4.15   In addition to these costs, there are some important cost categories which Ofcom has omitted from its consultation document. These include network planning, network design, and marketing and sales, although there are likely to be further categories which Ofcom has also omitted. Ofcom should ensure that its modelling is comprehensive and takes such factors into account.

4.16   Finally, Ofcom has not considered the extent of likely opex efficiencies in its consultation. Over the 40 year modelling period proposed by Ofcom, such efficiencies are likely to be very substantial, and if Ofcom does not take them into account, it is likely to considerably overestimate the costs of FTTP network construction.

4.2   Capex Efficiency

4.17   Ofcom does not appear to have considered whether there is any scope for capex efficiencies in its consultation. It should do so; these may be particularly important since FTTP roll-out in the UK is still at a nascent phase, where there are likely to be considerable lessons to be learned from early generations of roll-out.

5   Cost recovery

5.0   Depreciation approaches

5.1   In §§5.4-5.10 of its consultation, Ofcom sets out three depreciation approaches which it could adopt in its network model. However, it does not indicate a preference between them, instead stating that it plans to consult on its depreciation approach in its December 2019 consultation.

5.2   It is unclear exactly why Ofcom is not consulting on its preferred depreciation approach in this consultation, given that it has set out the various approaches. Until Ofcom settles on a depreciation approach, there is no viable manner of modelling network costs, and this means that in the course of the modelling approach, Ofcom will effectively have to decide on a depreciation profile in advance of the consultation on that topic.

5.3   TalkTalk has considered this issue, and is clear that the economic depreciation ('ED') approach is likely to be considerably more accurate and appropriate than a current cost accounting ('CCA') approach. A CCA approach will imply an economically irrational time path of pricing if prices are set equal to FAC, where an operator has a high unit depreciation charge in early years due to low volumes and initially undepreciated assets, and therefore there is a high notional cost per customer; while in later years there will be a lower charge, reflecting higher customer volumes. This is the opposite of the economic incentives facing an

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[2] See §3.12 of Ofcom's recent remedies consultation.

entrant FTTP network, which would want to rapidly gain market share initially, implying a low price in initial years.

5.4   Furthermore, as Ofcom points out at §5.7 of its consultation, Ofcom has used an ED approach on a number of previous occasions. There is consequently no argument that it would be too complex or difficult to adopt an ED approach, as it has previously been used by Ofcom.

5.5   Ofcom should therefore, following this consultation, rule out adopting a CCA approach to depreciation, and instead state that it will use an ED approach to depreciation. There is no need to wait for the December consultation to reach an initial proposal on this issue.

5.6   In addition to its consideration of recovery of capital costs, Ofcom should consider the best approach for the recovery of <u>fixed</u> operating costs (variable operating costs should be recovered when incurred). As with depreciation, in principle these could be recovered in various different ways over time. In general, Ofcom should assume in this regard that, firstly, efficiently operated firms may be willing to recover them in later periods after they are incurred; and, secondly, that network builders will adopt the approach to cost recovery which will maximise their profitability. This may imply that fixed opex in the early years after a network is launched will be recovered in later years when there are a greater number of customers connected to the network.

5.1   Assessment duration

5.7   Ofcom sets out at §5.11 that it proposes to use a 40-year horizon when conducting its assessment, with a perpetuity calculation to capture costs beyond the 40 year horizon.

5.8   This is appropriate. Adopting this approach allows Ofcom to choose an ED approach to depreciation, which as set out above is the approach which Ofcom should adopt. Ofcom also rightly notes that such a time period allows for long-run relationships to be appropriately handled within its model, another important point supporting a long model duration.

5.9   It is also appropriate to assume a steady state after a certain length of time, and Ofcom's proposal to assume a steady state after 2056/57 seems appropriate.

5.2   Shared costs

5.10   Shared costs are often difficult to deal with in a sensible manner in models such as the one which Ofcom is consulting upon. Ofcom has set out at §5.17 that its model can use three different approaches to shared cost allocation: EPMU, volume-based allocation, and value-based allocation.

5.11   While there is no perfect way to allocate shared costs, some approaches are more imperfect than others. In particular, volume-based allocations are likely to lead to strange results. Low priced products will see large proportionate mark-ups, implying a high 'cost' within the model, whereas very high priced products (such as very high bandwidth leased lines) see mark-ups for shared costs that are no more than a rounding error against their price.

5.12   In a volume-based structure, this is exacerbated by the wide range of products which potentially have a recognisable volume within the model which Ofcom will have to construct. There are both rental products and ancillary products, and it is not clear to what extent shared costs will be recovered from ancillary products, nor how they will be weighted against one another if shared costs are allocated to ancillaries– for example, it will make a significant difference whether a volume unit is a month or a year of rentals, when rentals have to be weighted against ancillaries. This essentially makes volume-based structures arbitrary, as there are an almost unlimited number of schemes which could be termed as 'volume-based'.

5.13   Ofcom should therefore not use volume-based shared cost allocations, as the approach is unviable and will likely lead to nonsensical results. At this stage, it is not clear whether an EPMU approach, with costs for all products considered on a per annum level, or a value based approach, would lead to the most intuitive and appropriate results. It would be helpful if Ofcom could provide some illustrations of the manner in which each of these approaches would allocate costs between products, and how the allocations would differ.

6   Other issues not considered by Ofcom

6.1   The above sections have set out in detail TalkTalk's responses to the various points made by Ofcom in its consultation paper. However, there are three other points relevant to the modelling exercise which have not been raised in the consultation:

- when using the data produced from this modelling exercise, Ofcom should be careful to amend the outputs to suit the purpose for which they are being used. In particular, if the model outputs are being used to set FTTC pricing, there should be an adjustment to reflect the quality differences between FTTP and FTTC, in line with the analysis presented in §6.42 of TalkTalk's June 2019 remedies submission and §§5.19-5.20 of Ofcom's remedies consultation;

- Ofcom has not covered the issue of the cost of capital in its paper, which will have a significant impact on the REO cost level as it will need to be used to discount returns. TalkTalk presumes that Ofcom will deal with this topic in its December consultation.

- in order to determine the REO rental price, Ofcom will need to assume prices for ancillary services (such as migrations). One option for this would be to assume that the ancillary prices equal the (incremental) costs. In our remedies consultation submission we proposed that Openreach ancillary charges, which are software based and do not involve field engineers (such as speed changes between different FTTP products) with a very low incremental cost per migration should be set at incremental cost (or zero). This approach would reduce switching costs for consumers, increasing competitive tension between operators. There is logic in assuming the same pricing approach for altnet entrants.