Promoting competition and investment in fibre networks

Initial consultation – Approach to modelling the costs of a fibre network

Virgin Media's response

20 August 2019

Non-confidential Response

1. INTRODUCTION

We welcome the opportunity to respond to Ofcom's Initial consultation – Approach to modelling the costs of a fibre network ("**the consultation**").[1]

Consistent with the approach Ofcom adopted for its WLA FTTC cost modelling in 2016, we welcome Ofcom's early engagement with stakeholders on this topic before (and separate to) the broader Fixed Telecoms Market Review (FTMR).

Following an initial review of the model and associated documentation, we broadly consider Ofcom's approach and chosen methodologies to be logical.

However, we have two key concerns:

- It is not clear how this analysis will contribute to Ofcom's broader decision-making processes as part of the FTMR. We would have welcomed more clarity about the intended purpose of the model outputs to comment better on whether or not the approach adopted suits those purposes; and
- A number of aspects of the model appear likely to produce outputs that will lead to an underestimate of the efficient real-world costs faced by a CP deploying a fibre network. We also expect calibration and cost verification to be more challenging for this model than in previous circumstances where Ofcom has developed bottom-up models.

We provide comments, especially on these two key concerns, in the body of our response.

[1] https://www.ofcom.org.uk/consultations-and-statements/category-2/investment-competition-fibre-networks-approach-model

2. Model purpose and model design choices

In the consultation, Ofcom identifies two key purposes for undertaking its assessment of the cost of deploying full fibre networks, namely (paraphrased):[2]

1. Understanding fibre network deployment costs to determine the likelihood of competition emerging in a particular area; and
2. To design charge control remedies for the forthcoming FTMR.

Ofcom's draft model is extensive and, as designed, has the capability to investigate a wide range of fibre network modelling scenarios. This flexibility is necessary to encompass the full gamut of potential networks and deployment scenarios Ofcom may wish to model to address purpose 1 above.

However, it also makes it more difficult to comment on the model in any significant detail in abstract – as these input data and assumptions are dummy values. The more degrees of freedom available in the model to be defined by the user, the greater the opportunity that any one given parameter or assumption adopted by Ofcom is inappropriate and yet consequential for the outputs. Uncovering any such parameters in the future will be time consuming for Ofcom and for its stakeholders. We would therefore encourage Ofcom to continue to engage with operators as its choice of the various model inputs crystallises.

One of the high-level stated purposes of this analysis is to contribute to Ofcom's view of the likelihood of competition emerging in a particular area. Cost of deployment, alongside forecast penetration and forecasted ARPU are likely to be amongst the first order factors that will determine whether to progress a build opportunity. All of these factors are likely to be of key importance and all of them are subject to uncertainty.

Therefore, to begin to form a view of the likelihood of competition emerging in a given area, Ofcom will need to consider these other factors carefully. Cost alone will lead Ofcom to inaccurate conclusions. We therefore anticipate Ofcom will provide further visibility of these other factors in due course, as they will be fundamental to any investor's plans. Without more clarity on how any modelled cost outputs will contribute to considerations of the likelihood that competition will

[2] Ibid., para 1.3

emerge in a given area, it is difficult to comment on whether Ofcom's proposed analysis will serve as a useful input to this broader analysis.

Question 1: Do you agree with our general approach to modelling?

Bottom-up approach

As we noted in our comments on Ofcom's 2016 FTTC cost modelling analysis,[3] there are a number of factors that can lead to a bottom-up cost modelling approach being more appropriate than a top-down approach.

Based on the various factors we described in response to that consultation, we agree that a bottom-up model is necessary and appropriate in this case.

Services in scope

We agree that it is appropriate to consider FTTP, leased lines (Ethernet and WDM) and dark fibre services as the potential broad portfolio of services that may be provided by the hypothetical network operator. Given changes to Physical Infrastructure Access (PIA) as part of the Physical Infrastructure Market Review (PIMR); whether a network is built using PIA or self-built (or a mixture of both), the CP would have the ability to provide a full variety of services.

Given Ofcom intends to use the outputs of this modelling exercise to inform its charge control remedies, we also agree that it is appropriate to incorporate PIA as a potential use of these infrastructure resources and a destination for the costs that result. Ofcom has previously noted the potential to revisit the mechanism used to define the charge controls for PIA. We would be grateful if Ofcom could clarify whether or not the FTMR (and this model) will therefore serve that purpose.[4]

As we noted in our PIMR response,[5] investors may adopt a more targeted approach, specialising in particular services, market segments or geographies, rather than seeking to be all things to all people. Clearly, it is not practical for Ofcom to model the wide variety of any and all potential strategies a particular investor might adopt. However, these considerations are factor to which the model outputs may be sensitive.[6] Therefore, variations in services offered should be reflected in the scenarios Ofcom ultimately defines.

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[3] https://www.ofcom.org.uk/__data/assets/pdf_file/0024/83517/virgin_media.pdf, p5-7.
[4] As it was not clear from Ofcom's documentation that this was a specific purpose of the model, we have not reviewed and commented on this analysis with this use specifically in mind.
[5] https://www.ofcom.org.uk/__data/assets/pdf_file/0024/139461/virgin-media.pdf, page 21
[6] It will also certainly be an important factor when considering the broader question of whether competition will emerge in a given area.

Network scope

Ofcom's analysis spans from the premises to the access node and from the access node to the aggregation node. As Ofcom and Cartesian note, this excludes costs associated with the core and much of the aggregation network.

While this may be reasonable, Ofcom has not set out the justification for this exclusion.[7] As we are unclear about Ofcom's specific intended use of these outputs, in particular for 'purpose 1' (as we define it above), we would welcome more clarity about why these segments of the network are excluded – as they would require initial capex and ongoing upgrade for any operator seeking to deploy network and offer services. Clearly these network segments are ultimately as important as any other to deliver services. Therefore, we would welcome clarification.

If Ofcom intends to undertake analysis, based on the outputs of this model, to understand whether costs and potential revenue streams lead to CPs finding hypothetical investments viable and attractive, these costs would need to be incorporated into the cost stack to avoid underestimation. This would be the case for an existing provider that needed to augment existing core and aggregation capabilities to invest in fibre networks (and so incur incremental cost) as well as new entrants that would need to invest in this capacity entirely to serve the new network it envisages (and therefore it would follow, the full cost of these segments would be incremental).

Network coverage/geographic unit

Consistent with our response to the initial consultation on geographic markets, we continue to agree with Ofcom that postcode sectors strike a pragmatic balance, for the initial FTMR, between defining a geographic unit that provides sufficient granularity without introducing unnecessary complexity.

We agree with Ofcom that an operator would often consider a network deployment to span a wider geographic area. As Cartesian notes, on average, a postcode sector encompasses c.3,000 premises.

[✂].

Scorched node/earth approach

[7] For example, assuming the modelled operator reaches a reasonable minimum efficient scale, this may be a less material cost factor to consider.

We agree that it is reasonable to model either approach given the range of scenarios Ofcom is considering. Clearly, it is also necessary for scenarios intended to reflect Openreach's potential cost to deploy.

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Model calibration and cost verification

Compared to Ofcom's prior bottom-up modelling exercises, we expect that it will be especially challenging for Ofcom to calibrate and verify/validate outputs of this model. Nevertheless, calibration will be vital if Ofcom intends to use these model outputs to assess the likelihood of competition emerging in a given area.

Ofcom will presumably seek to populate the model and generate meaningful outputs in preparation for the FTMR, due in late-2019. While these inputs may be further refined throughout the market review process, this will mean inputs will need to be provided soon.

FTTP build by most new altnets is still nascent and is likely to continue to be in its infancy throughout the early stages of the FTMR.[8]

As a result, the robustness/validity of business case models that Ofcom may rely on may be largely untested and unverified. We would also note that many of these business case analyses will have been developed to attract funding from external investors. These investors will have limited real-world UK case studies of FTTP business cases to compare against.

Therefore, it is conceivable that these business case assessments may be overly optimistic regarding the ability to control costs, may inadvertently omit costs that the altnet was not/is not yet aware of and may be overconfident about take-up assumptions or the blend of services it will sell (and how this mix will evolve over time) and the willingness to pay for these services. Furthermore, given the influx of potential new entrants seeking funds to deploy new networks in recent months and years, these business cases may err in assuming a captive market awaits their investment. Ofcom's intention to encourage investment in competing networks may lead to competitive pressure having a greater impact on business cases (or impacting sooner) than may have originally been forecasted.

[8] For example, TalkTalk (initially via CityFibre) announced its FTTP build in York in 2014. Its latest ambition is to reach 50,000 premises in York by the end of 2019. If TalkTalk manages to achieve this ambition, it may have rolled out between 2014-19 what Project Lightning is currently (approximately) building each month.

We note that even in the case of Openreach, it has yet to undertake material FTTP build in the 'final 10%' of premises and it anticipates undertaking trials of such deployments soon. These outputs are likely to be important to validate Ofcom's assumptions about the expected cost of build.[9]

Based on the details provided in this initial consultation, and our initial review, we have identified a number of features of the modelling approach that we expect will lead to overly theoretical outputs that risk underestimating a realistic efficient cost. These factors are likely to have a compounding effect and endanger producing results that do not reflect the real-world. We are also concerned that inputs from CPs that Ofcom might seek to rely on, for example investment case cost analyses, could similarly be flawed. This optimism bias risk has been less likely to arise in previous bottom-up cost modelling exercises that Ofcom has undertaken. For example, MCT or FTTC bottom-up cost modelling has been undertaken against pre-existing networks with costs actually incurred, audited and subject to the scrutiny of Ofcom, tax authorities and existing shareholders alike.

In short, as a result, we believe various assumptions and intermediate outputs should be uplifted by appropriate factors where it is clear the analysis will under-dimension costs. This may also be true of assumptions or modelling parameters once non-dummy values are input. This will reduce the reliance on directly calibrating costs at the end of the process and so make the adjustments to the theoretical model more transparent. Where we identify aspects of the model that appear 'too theoretical' we identify these throughout the remainder of our response.

[9] https://www.ofcom.org.uk/__data/assets/pdf_file/0025/159028/openreach.pdf, for example, para 2.c.v and para 15.

Question 2: Do you agree with our approach to forecasting service volumes?

Ofcom describes its method for modelling FTTP take-up to be predicated on the hypothetical network reaching its long-run take-up level within ten years. It is common practice in bottom-up models to define a period of deployment and gradual adoption before arriving at a steady state to then project forward to complete the necessary time horizon for the economic depreciation profile to be defined. Broadly, we do not take issue with this steady state approach, as specific longer-term projections become increasingly difficult to justify, are open to conjecture and the impact of outer year outputs on the present value results are often less material than assumptions that impact on the initial years of the model.

However, Ofcom's deployment scenarios do not appear to reflect the expectation of competitive overbuild and therefore the potential for take-up rates to decline against the ex ante business case. Given our previous concerns about optimism bias and the potential uses that Ofcom might put these outputs to, it seems necessary to assume (or at least allow for) the reality that in hindsight, business case assumptions may not have had perfect foresight.[10] As noted previously, this complication is unlikely to have been an important factor inherent to Ofcom's previous bottom-up cost modelling exercises.

Whether Ofcom were to model a hypothetical network that was meant to emulate a new entrant altnet, Openreach or Virgin Media, it is likely that new competition will emerge over time. This may not only be a long-term consideration; it may be prevalent during the 2021-26 FTMR charge control period.[11]

We would welcome further guidance from Ofcom about how it will determine the mix of services sold by the hypothetical network. As noted previously, business case models may suffer from optimism bias: assuming that a new entrant may be disproportionately successful in acquiring high-value customers with appetite to purchase ever-increasing value-added services.

[10] Again, we note this as we have no detailed guidance on what specific purpose Ofcom will put the outputs of this model to, as it relates to 'purpose 1'. If it intends to assess charge-controlled price levels that would permit/induce investment in a given geographic area, it should recognise that this assessment will be made under the risk of a wide variety of factors. Ofcom's assessment would not be accurate if it assumed that rational investors have precognition about the future evolution of prices, competitive pressure and cost.
[11] This could be particularly consequential for the accuracy of modelled outputs for a hypothetical new altnet that is geographically concentrated and yet is overbuilt.

If Ofcom were to adopt a mix of service-types and bandwidths based on its own forecasts (rather than the business case assumptions of a network investor), we would be keen to understand how it would resolve this potential conflict when calibrating the model.

Question 3: Do you agree with our approach to network dimensioning and costing?

FTTP rollout approach

Ofcom describes the approach to dimensioning FTTP rollout as beginning by developing a rank of postcode sectors by cost to deploy. The hypothetical network investor would then rollout to these areas, effectively from cheapest to most expensive, up to its planned coverage target. We reiterate our concern that, even when considering this as an abstract question, cost to deploy (alone) is not sufficient as a starting point.

While we recognise this is a simplifying assumption, it seems clear that this will not reflect the approach that any operator would reasonably be expected to take. We think this premise is material and also improbable and so the modelled scenarios will systematically underestimate costs: by prior assumption, cost minimisation is taken as given. Therefore, we think this is a dangerous starting point and, despite it introducing complexity, should be reconsidered or adapted.

Below we describe the operators that Ofcom may consider modelling and why this approach may be problematic in all cases.

Modelling Openreach

If Ofcom were to seek to model an operator similar to Openreach, it is likely its focus will be primarily on overbuilding Virgin Media's network, so that it is better able to compete with existing ultrafast propositions and regain market share. BT's business case would anticipate that this would result in incremental wholesale revenues for Openreach as well as retail revenues for its retail business units that were more materially (and recognised sooner) than non-Virgin Media areas.

Building to the cheapest areas first (regardless of whether Virgin Media is present) would cannibalise existing copper assets, only to protect against the potential future risk that new competition will emerge (whether by Virgin Media, or a new altnet). This is plausible, but given the time to build for new entrants and for the new entrant to acquire customers, Openreach's investments would be rationally expected to focus on existing and established competition first.

Additionally (as a secondary consideration), Openreach may also have a strong bias towards deploying to areas where it is confident it can reuse a high proportion of its existing network infrastructure. As a result, it may be less inclined to deploy to areas where its existing network is

primarily direct buried – unless we are already present. These factors are likely to be important considerations for Openreach when considering its priorities for build.

While Virgin Media's existing footprint may be correlated with areas ranked as lower cost by Ofcom's algorithm, it is not clear to us how strong this relationship would be, or how important it would be to Openreach.[12]

Modelling Virgin Media

If Ofcom were to seek to model an operator similar to Virgin Media, clearly it would need to consider its existing coverage when identifying target areas.

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Modelling new altnets

Ofcom will no-doubt have a good understanding of the range of factors that new altnets consider when choosing areas to target. In contrast to Openreach, which may seek to target its main competitor 'head-on', new altnets may prefer to target areas where Virgin Media is not present, Openreach has not disclosed an imminent intention to build FTTP to, and other potentially altnets have not announced plans either.

Furthermore, a number of altnets have expressed the intention to make significant use of PIA to deploy their networks. As a result, widespread availability of PIA capacity in a given area may be more important to an altnets' criteria, rather than the strictly the lowest expected cost based on density and other factors.

Furthermore, given Openreach has signalled its intention to change the charging structure for PIA customer connections to a fixed price, regardless of meterage, the role that density plays in investors' considerations is likely to become even more complex.[13]

Opex costs

[12] Ofcom will have the data to confirm how strong this relationship is.
[13] Given this intention are recent and not yet confirmed (and many potential new altnets do not yet attend the relevant PIA forums) this may not be something that is reflected in any of the business cases Ofcom may seek to rely on to calibrate its model.

We do not have any material comments on Ofcom's approach to opex costs at this stage. This is an area where we expect calibration will be particularly important. We agree with Ofcom that a simplified approach is likely to be appropriate in most cases, particularly regarding general overheads.

We would note that we strongly encourage Ofcom to consider the cost faced by network investors other than Openreach when seeking to calibrate costs. Other CPs would be expected to face incremental costs associated with PIA that Openreach would not face when consuming its own network.

CPs, particularly new entrants, are also likely to suffer from material diseconomies of scale and scope. Network investors will face a wide range of internal/external personnel costs such as strategic network design, planning, project management and liaison with local authorities. Given these costs may be material[14] and the potential for this to vary widely between operators of different scales, it may warrant a more direct analysis than Ofcom currently proposes.

Capex and network dimensioning

Below we provide various initial comments related to the network dimensioning approach. Given the relatively short consultation period and the complexity of the modelling exercise, we anticipating providing more substantive comments once the model is populated with actual values.

EMST: We agree that the EMST approach is reasonable. However, from our experience, this typically underestimates the required meterage by approximately **[✂]**%. We consider it would be appropriate to adjust the results of this analysis by such a factor, rather than rely on calibrating costs later in the modelling process.

PIA costs and activities: From our initial review of the analysis, it is not clear whether various potential sources of cost of using PIA have been adequately captured, except the duct congestion statuses. For example, for underground, it is likely that that significant costs would be incurred remedying infrastructure (for example silting). Similarly, for overhead, pole congestion and non-climbable poles (e.g. Hazard poles and shallow depth poles) will add cost. We anticipate further work may be required to adequately reflect the complexities associated with using PIA and that, simplistically, it does not simply result in the avoidance of civils costs.

[14] For example, this could contribute an additional **[✂]**% of capitalised opex alongside the cost per premises passed.

GPON migration: We agree with Ofcom's general approach to technology migration (GPON 2.5G to GPON 10G). This would typically be the approach Virgin Media would adopt when undertaking its own network cost forecasting. Migration from 2.5 to 10 GPON will be influenced by a range of factors, but primarily by growth in service take up (time to reach economic break even between 2.5G and 10G). Ofcom creates an overall blended equipment cost. While this is a reasonable approach, we would expect the speed of migration to vary by area, for example denser areas requiring upgrade sooner, and therefore a methodology which permits this migration to vary may improve the accuracy of the model outputs. Based on the documentation and given the model is currently populated with dummy inputs, it is not clear if this functionality is intended.

Uncertainties/clarifications on the dimensioning approach

We have also identified a number of aspects of the network dimensioning that we found either confusing or unclear, based on our initial review of the initial model and the associated documentation:[15]

a) The report sets out the logic applied for dimensioning underground deployments. However, the same level of detail is not currently provided for overhead;

b) It is not clear how the choice between underground, overhead or a given mix would be made. This is significant in terms of cost of delivery, especially where segment 1 costs dominate, such as connecting exchanges to more distant towns, where the lower cost to deliver overhead could make these towns look like areas of viable competition;

c) For the underground solution that is presented, the logic to estimate the volume of new duct required is based on the postcode sector averages of duct congestion, the mix between ducted and non-ducted existing infrastructure, and the average number of new cables required. Our concern with this approach is that the distribution of cable numbers per duct are highly asymmetric even within a postcode sector; the red areas (based on Openreach's network) typically being the locations where the greatest density of new cables would be required. In contrast, we would expect much lower average cable numbers in amber and green sections; and

[15] We fully recognise this is an initial consultation and anticipate further documentation of the modelling approach will be provided at a later date, especially once dummy values are replaced.

d) The modelling approach assumes the portion of infrastructure with no RAG status would require new duct, this would be the case for directly buried infrastructure, however the majority of this is likely to be overhead, which would we would anticipate would need to feedback into the general deployment approach.

Question 4: Do you agree with our approach to cost recovery?

We do not have material comments on the various cost recovery options that Ofcom presents. These are the standard range of candidate approaches that Ofcom would typically consider.

Depending on the purpose Ofcom intends to use these outputs for, we would note a broader potential challenge in drawing inferences from theoretical long-run cost recovery approaches (especially economic depreciation). New entrant altnets are likely to be under significant pressure to meet shorter term hurdle rates and targets.

Financial performance implied by economic depreciation (which in this sector, ceteris paribus, would backload cost recovery) is unlikely to be tolerated by investors.

This may mean that Ofcom needs to diverge from its usual approach to cost recovery modelling if its analysis will consider whether or not its remedies are designed to enable altnet CPs to continue to be viable and able to attract (or retain existing) funding for their forecasted expansion.