

## Annex B – Price rebalancing

### BT's Response to Annex 12 of the June 2015 LLCC Consultation

#### Price rebalancing analysis to inform Ethernet sub-cap proposals

1. In this section we respond to Ofcom's analysis in Annex 12 regarding BT's potential price balancing requirements, in the case of introduction of a dark fibre remedy.

##### Introduction - Requirement for price rebalancing

2. In paragraph A12.1, Ofcom says:

*"we consider it is likely that BT will ultimately need to rebalance its active prices as a result of the proposed dark fibre being available, and so there may be a concern that sub-caps could be unduly restrictive on prices for charge controlled services such that the necessary rebalancing could not occur. Therefore to inform our proposals for sub-caps on charges within the Ethernet basket, we have therefore carried out an indicative analysis of the potential scale of price rebalancing that may be necessary in light of our proposed dark fibre remedy."*

3. We agree with Ofcom that BT may ultimately need the flexibility for price rebalancing of its active prices, as a result of the proposed dark fibre remedy at EAD 1G minus. In this section of Annex B, we consider that price rebalancing refers to the review of charges for existing products and services already in the portfolio, and therefore we do not refer to some more advanced considerations of additional flexibility that could be offered through de-averaging of products and services by geography, volume, cost, density, nature of work required, or through on-net/off-net considerations, and which we cover separately in our response to question 6.1.
4. Ofcom clarifies that *"It is important to note that this analysis is for our sub-cap proposals only. The total amount that BT is able to recover, and so the overall value of X for the Ethernet basket, is unaffected by the potential need for active price rebalancing."* (A12.2BT welcomes this clarification. However we consider that there is a fundamental issue that price rebalancing alone would not counteract some of the negative effects of dark fibre, if priced at EAD 1G minus as it would not remove some of the endogenous risks stemming from the linkage between the active and passive product.
5. By that, we mean that the tight coupling of dark fibre pricing with the high-volume product EAD 1G, means that Openreach is essentially presented with ✂:

✂

6. We discuss these ✂ in section 17 of our response to the May 2015 BCMR Consultation dated 31 July 2015.

✂

7. In the past, Openreach has rebalanced its EAD 10M in relative terms compared to EAD 100M by not decreasing EAD 10M prices. However it has not done any active rebalancing which would require it to increase prices. ✂. With more than 150,000 circuits in place at 10/100M (including EAD and legacy), increasing rental prices is not an option that would appeal to customers. We

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therefore see increasing rental prices as a last resort option, one that may be necessary given dark fibre introduction but one that Openreach would not consider lightly.

8. In addition, because of the overall value of X at 13.75%, and given that any price increases from the rebalancing would need to be compensated by price decreases in other products, we believe the overall level of rebalancing afforded would be low, if any.
9. As a bare minimum, Openreach needs to be able to rebalance connection prices. We describe in our response to Question 10.1 that in a control where payback time for circuits will increase sharply, it is logical to consider small increases in connection charges, to balance sharp decreases in rental and main link. This would protect against arbitrage of CPs requiring circuits for a short duration taking more of Openreach's active products when it is not commercially viable for Openreach.
10. In summary, BT's view is that the consideration of price rebalancing requirements is therefore necessary, but would not be sufficient in mitigating all the risks which were caused by the introduction of dark fibre in the first instance.
  - a. Should Ofcom mandate dark fibre at EAD 1G minus prices, BT may require the flexibility to rebalance prices.
  - b. We would not consider price increases lightly on services other than connections given our customers' expectations.
  - c. Price increases would present practical implementation issues, as the value of X is negative, and therefore any price increase must be matched with significant price decreases within the same basket.
  - d. Price rebalancing leads towards a scenario where there is no bandwidth gradient whatsoever and where 10/100M products would be commercially withdrawn, thus limiting the offering to customers.
11. Notwithstanding those considerations, we discuss below the overall amount of arbitrage created by dark fibre and thus the size of the rebalancing requirement.

### Ofcom's approach to modelling the rebalancing requirement

12. Ofcom's analytical approach is set out in paragraphs A12.3-A12.12 of Annex 12.
13. Ofcom considers that *"Ideally, we would conduct this analysis for 2018/19, as this would allow us to estimate the potential impact on the active pricing structure at the end of the charge control when revenues would have been forecast to come into line with overall costs and volumes are at the level they will be when dark fibre has been introduced. However, inferring 2018/19 prices in the absence of dark fibre (both absolute and the overall pricing structure) would be highly speculative."* (A12.4).

We have produced in Section 17 of our response to the May 2015 BCMR Consultation dated 31 July 2015 two scenarios, which comply with the draft proposals for the conditions on the charge

control.  $\times$ . However, given that products above 1G will not be subject to a CPI-X glidepath, we consider 15/16 prices present a better base for comparison for the requirement on price arbitrage.

14. Ofcom says (A12.5) that: *“At the extreme, and so as not to understate the scale of rebalancing, we might expect in the longer term that all active circuits which can viably be provided with dark fibre (internal and external) could ultimately end up being priced at a level equal to the dark fibre price plus the active-specific incremental circuit costs, regardless of actual take-up. This is so that BT remains competitive: otherwise, if BT tried to price such circuits above this level, equally efficient CPs could switch to dark fibre and supply the active-specific incremental costs themselves. Given this, we consider that in this scenario, the differential between the active price of circuits which could viably be provided with dark fibre and the price of dark fibre plus the active specific incremental costs could be rebalanced. Therefore we estimate the potential scale of rebalancing by multiplying this differential by the corresponding 2018/19 volumes.”*
15. We agree with Ofcom that it is likely that the introduction of dark fibre at EAD 1G minus pricing means that, so as to present two equally appealing propositions between active and passive products that have no arbitrage opportunity, Openreach would ultimately need to price active products at the level of:
- a. the dark fibre price,
  - b. to which the active specific incremental costs (including the electronics box) is added,
  - c. to which an additional opportunity cost for the CP to perform this task themselves can be added.

We illustrate this in the figure below, which broadly aligns with Ofcom’s considerations in figure A12.1 of its June 2015 LLCC Consultation.

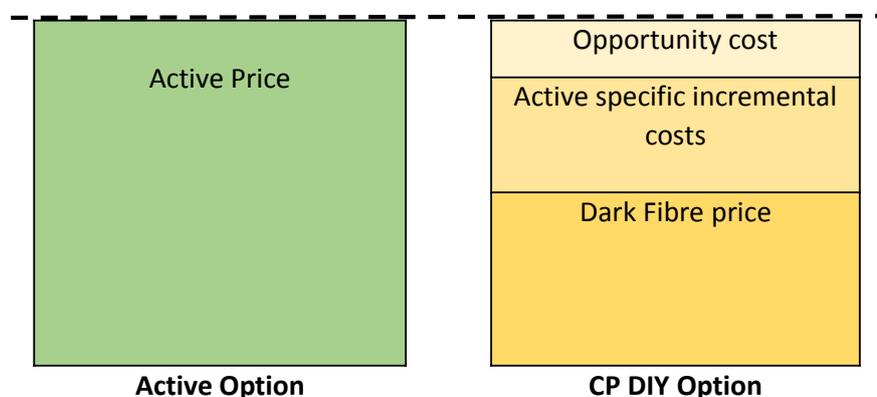


Figure 1: Active vs Passive arbitrage

Example: EAD 1G ER

16. Ofcom has indicated in its BCMR Consultation annex [A26.156] that *“As noted the cost differences found in the ER variant reflect active component cost differences and hence this is no requirement for a ‘Dark Fibre ER’”*. It is therefore proposed that dark fibre will use EAD 1G rental charges as the reference for the calculation of the minus independent of the distance, and in particular that EAD Extended Reach (ER) will also use EAD 1Gbit/s standard as the reference.

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17. We assume only for the purpose of discussion in this section that the “EAD 1G minus” price for dark fibre STD is fully effective in creating no arbitrage opportunity between active and passive products for the EAD 1G STD variant. In that scenario, it should be neutral for a CP to either pay the extra amount required for installing an ER box  $\pounds$  in addition to a standard box, or paying the extra charges that Openreach is charging on its ER product. Currently EAD 1G ER is priced  $\pounds 450$  higher for a connection, and  $\pounds 2,298$  higher for rental. ER therefore recovers more against all generic costs than its standard counterpart. In particular this means this product which has significantly longer routes (typically  $\pounds$ ) can recover more towards the cost of network build.

Figure 2:  $\pounds$

18. In this scenario, this means that the introduction of dark fibre would ensure that Openreach would price EAD 1G ER not at a premium of  $\pounds 2,748$  TCO over one year compared to EAD STD, but only at a premium of  $\pounds$ . Over a three year period, the premium that would have been  $\pounds 7,344$  would  $\pounds$ . In other words, Openreach should eventually review its pricing so that:

- The incremental rental charge of ER vs 1G STD  $\pounds$ ; and
- The incremental connection charge of ER vs 1G STD  $\pounds$ .

19. This would result in an average of  $\pounds$  of lost revenue for Openreach, per EAD 1G ER circuit, independent of the length of circuit, every year.

As per Ofcom’s approach to calculating the potential per circuit rebalancing required, this means for an EAD 1G ER the potential for rebalancing requirement is  $\pounds$ .

20. Considering that Openreach currently provides  $\pounds$  such EAD 1G ER circuits in 15/16, the total rebalancing requirement for those EAD ER circuits alone is  $\pounds$ / year. With Ofcom’s approach of using 15/16 prices, and 18/19 volumes ( $\pounds$  circuits), this number increases to  $\pounds$ / year. We set out our calculations in the table below.

Table 1:  $\pounds$

$\pounds$

21. We therefore do not understand how Ofcom has arrived at the conclusion that with EAD 1G minus pricing for dark fibre, only  $\pounds 2m$  in aggregate (A12.9) would need rebalancing, when we observe  $\pounds$ .

22. Two issues that are likely to lead to such an under-statement of the rebalancing requirement are:

- a) Ofcom has not listed all product variants that are subject to arbitrage. We discuss below how table A12.1 does not fully list the correct list of product variants commercially viable with dark fibre.
- b) Ofcom uses a one-year TCO which is not reflective of the average purchase decision.

We discuss below in more detail.

Alternative to table A12.1

23. Table A12.1 in Annex 12 sets out Ofcom's assessment of the potential commercial viability of active circuits with dark fibre priced on 1Gbit/s active minus basis, based on a one year minimum term, and 2015/16 prices and costs. In BT's view the assessment in Table A12.1 is factually incorrect. WES/BES 1Gbit/s products are deemed non-commercially viable with dark fibre, when in fact they are and should be considered. WES/BES 1Gbit/s rental is priced 50% higher than EAD 1G, and thus by definition these products are an immediate target for migration to dark fibre, all the more so given that they are now coming to end of life, and will not be supported from 2018.
  24. Moreover, Ofcom states in A12.6 that it uses the basis of rental plus connection for this assessment, over a single one year period. When assessing risks of arbitrage, a longer period of time needs to be considered. Three years for an access circuit and five years for a backhaul circuit are typical. Considering a single year for the purpose of this exercise presents the risk of ignoring the fact that a CP may incur some additional upfront costs in building their own active solution, but will then reduce significantly their ongoing fees. In other words, CPs will invest for a longer term than one year when choosing dark fibre. In our analysis below, we have used a three year total cost of ownership but divided by three, to reflect the cost to a CP in a year.
  25. To provide Ofcom with an alternative view to Table A12.1, we have performed a comparison at April 2015 prices, on our existing inventory of circa. 300 circuits and evaluated the TCO that a dark fibre would have, with the cost of electronics and installation added, compared to that particular active circuit TCO. We have then created the heat map of products where there would be 5% or more price arbitrage with dark fibre. For this purpose, we have used a simplified schedule for the cost of electronics and installation, ranging from 300 for EAD circuits at 1G or below to 300 for most complex 10G circuits such as Optical services. We use dark fibre pricing as it would be in 15/16 given Ofcom's approach to calculate the LRIC differential.
- 300
26. This shows that not only WES/WEES/BES at 1G circuits are all subject to price arbitrage, but also that 300 EAD 1G circuits could potentially present at least some minor price arbitrage opportunity.
  27. Ofcom in its table A12.1 has not listed individual EAD product variants that could be subject to significant price arbitrage such as Extended Reach variants at all bandwidths.
  28. In addition to this, table A12.1 does not list EAD 10G launched this year with volumes forecast to reach over 7,000 circuits by 18/19 absent dark fibre. This means that Ofcom has ignored the very high level of arbitrage presented to this new product.
  29. Moreover, such a heat map only takes into account the potential for 1:1 substitution. As we have discussed separately in section 17 of our BCMR response dated 31 July 2015, there is a major risk of aggregation of circuits at all bandwidths including 10/100M if dark fibre is mandated. Ofcom's assumption in A12.8 is therefore failing to consider the density of some routes, which is another reason why dark fibre would create a gap in cost recovery. Such aggregation points to the need for asymmetrical pricing between EAD products and dark fibre, rather than a straight rebalancing of active products.

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30. We provide below a summary of the effect of aggregation: from a total base of  $\times$  non CLA circuits, which are non-resilient and not in the excluded Data Centres/TAN areas,  $\times$  of circuits share a common route. Where this occurs, an average of  $\times$  circuits can be aggregated into one. This means that over the whole base we see a  $\times$  compression ratio from dark fibre. The aggregation effect would be worst in the first years of introduction of dark fibre, where CPs would start migrating routes where they have e.g. five to ten or more circuits.
31. Should Openreach decide to offer dark fibre in CLA and Data Centres/TAN areas for consistency of offering across geographies and to match customer demand, this effect would likely be even worse in the CLA with on average a  $\times$  compression ratio with  $\times$  of circuits being candidates for aggregation and an average of  $\times$  circuits can be aggregated into one.

Table 2:  $\times$

32. Having stated that there are more product variants subject to price arbitrage than envisaged by Ofcom, that TCO needs to be considered for at least three years, and that arbitrage could be further compounded by aggregation, we provide below our own assessment of the rebalancing through two different approaches:
- Method #1 - Review of 15/16 inventory of the installed base of circuits, and April 15/16 prices
  - Method #2 – Review of individual charges and arbitrage opportunity by product variant, for new supply and for migration, in 18/19, and at August 15/16 prices

### Our own derivation of the rebalancing requirement – Method #1

33. We consider the 15/16 existing base of circuits where we see opportunity for 5% price arbitrage or more, and compute the unrecovered revenue for those circuits minus the cost of electronics and installation. The numbers below provide a ballpark figure of the requirement for rebalancing, and estimates the gap per year against the volumes in 15/16 and the prices as of April 2015.
34. While we recognise that the underlying model has some simplifications, and there may be a need for further corrections (e.g. removal of outliers from the inventory), we provide this to Ofcom to show that our understanding is that far from a £2m overall requirement on rebalancing, we estimate that a more realistic rebalancing requirement would be around circa.  $\times$ m at April 15/16 prices, when disregarding aggregation.

Table 3:  $\times$

$\times$

35. We believe that this number would be further compounded by the effects of aggregation, which we have outlined to be a  $\times$  ratio. The above figure and modelling does not account for such aggregation.

### Our own derivation of the rebalancing requirement – Method #2

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36. Because of the importance of this matter, and the large discrepancy between BT's identified requirement and Ofcom's very small number, we consider an alternative approach to assessing the rebalancing requirement.
37. Rather than considering the existing 15/16 base of circuits and identifying whether there is 5% or more price arbitrage, we review the current August 15/16 price list for a representative set of our Ethernet product variants, and assess whether they are commercially viable with dark fibre with the matching electronics and additional set-up and running costs that the CP may incur.
38. We consider the arbitrage presented to a CP between:
- the TCO over three years for active, including connection and rentals of active, vs.
  - the TCO over three years of dark fibre and cost for the CP to provision the active service themselves, including dark fibre connection and rentals, electronics and other costs to the CP.

This leads to the following figure and table which show which product variants are commercially viable with dark fibre (in red)<sup>1</sup>. When multiplying the arbitrage on each circuit by the volumes of new supply in 18/19, we identify circa.  $\pounds$  of arbitrage per year just on new supply in that year.

Figure 3:  $\pounds$

Table 4:  $\pounds$

39. As price arbitrage occurs not just on new supply, but also on the existing base, we further take into account the following:
- 1:1 substitution opportunity for circuits that are in place on 1 April 18/19 [73% of our base]; and
  - Multiple circuits to one aggregation opportunity for circuits that are in place on 1 April 18/19 and share a route with at least another circuit [27% of our base].
40. To establish whether circuits in the existing base are candidates for substitution, we compare the rental of active circuits, to the full cost of dark fibre connection, rental, plus electronics and other costs over three years. This means that for a given product, there is less arbitrage opportunity from 1:1 substitution than for new supply, because CPs do not have to incur further active connection charges once their circuit is active.
41. To illustrate the potential risk of arbitrage presented by aggregation, we provide the following view by product variant when  $\pounds$  circuits can be aggregated into a single dark fibre route (as described in [30],  $\pounds$  is the average number of circuits when aggregation is possible).

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<sup>1</sup> For these calculations of price arbitrage, we have compared the price of active circuits to a single fibre except for resilient circuits, which require two fibres. For Optical services, we see an emerging set of single fibre working solutions that would enable CPs to purchase a single Dark fibre from Openreach. Single fibre working may partly limit the maximum number of wavelengths run on a bearer, but we consider that it is likely something CPs would consider if there was any significant arbitrage opportunity between single and dual fibre working options.

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In that case, we take into account the added costs of electronics, e.g. 2x1Gbit/s circuits will require 10Gbit/s electronics to be aggregated onto a single dark fibre. ✂.

Figure 4: ✂

42. We derive the total annual arbitrage opportunity as of FY18/19 as c. ✂. It incorporates the three components identified and tabulated below:

- Arbitrage from new supply in the year
- Arbitrage from 1:1 substitution in the existing base
- Arbitrage from aggregation in the existing base

It is important to note that we have assumed the full dark fibre connection charge would be applied on migrations from active to dark fibre (circa. £2k at 15/16 prices). Any discount on the connection charge for migrations would significantly increase the total arbitrage value<sup>2</sup>.

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<sup>2</sup> For illustration purposes, a 20% reduction in the connection charged for dark fibre for a migration would result in a 5% overall increase of the total arbitrage opportunity

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43. In this second approach, taking multiple effects into account, we therefore have a need for rebalancing worth nearly  $\pounds 200m$ , significantly different from Ofcom's  $\pounds 2m$  estimate.
44. In particular, Ofcom has not sufficiently considered the arbitrage opportunities on the EAD portfolio, depicted below. In our view, ignoring EAD 10G and EAD 1G complex product variants leads to significantly undercalling the rebalancing requirement.

Figure 5:  $\pounds 200m$

45. Finally, we stress that  $\pounds 200m$  is only the value of arbitrage. By no means does this value reflect the full extent of the potential impact on Openreach's revenues, which is equal to the arbitrage value plus the cost of electronics and installation and running costs. In this analysis, the corresponding value for the total risk to Openreach revenues is  $\pounds 200m^3$ .

### Conclusions

46. Our conclusions on the analysis performed by Ofcom for the requirement for price rebalancing are summarised below:
- Dark fibre priced at EAD 1G minus means there will ultimately be a need to rebalance prices overall.
  - A CPI-X control with  $X=13.75\%$ , and customer's expectations would restrict opportunities for significant rebalancing, and rebalancing would not be sufficient to mitigate a number of the risks introduced by dark fibre and that stem from the fixed linkage between active and passive products.
  - Ofcom significantly understates the rebalancing requirement, with a circa.  $\pounds 2m$  estimate. Openreach calculates it to be nearer  $\pounds 200m$  / year through two different approaches.
  - Beyond the requirement for additional rebalancing, Ofcom has underestimated the risks presented by dark fibre priced at EAD 1G minus, and we consider it is unlikely Ofcom has appropriately reflected the right level of arbitrage and loss of revenues for Openreach in its calculations of the X in the CPI-X control.
  - Ofcom should consider removing sub-caps altogether to allow Openreach to respond to market demand and the need to adapt its pricing structure as Ofcom introduces significant uncertainty with dark fibre.
  - As a concrete measure to offer some pricing flexibility, Openreach proposes in our response to Question 10.1 to introduce a simple measure for sub-caps allowing for rebalancing of connection, by testing that the TCO over a year from connection, rental and main link does not increase, rather than a cap on individual charges.

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<sup>3</sup> And this value would be significantly more if the migration fee for an existing circuit migrating to dark fibre was to be lower than a full dark fibre connection fee, i.e. less than circa.  $\pounds 2000$  (at 15/16 prices).

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- This may not be sufficient, and we will continue to explore further implications of the imposition of a dark fibre remedy at EAD 1G minus price in terms of requirements on prices for the active portfolio.