BT's response to Ofcom's consultation document

"Mobile Call Termination market review 2015-18"

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NON CONFIDENTIAL VERSION

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1. Executive Summary

1.1. BT has supported lower mobile termination rates in the last two mobile call termination market review processes and continues to support setting these rates based on a pure LRIC cost standard. This is consistent with the principles of technology neutrality (not least by ensuring that the same approach continues to be applied as between fixed and mobile termination rates); consistent with the findings of Ofcom and various appeal bodies in the last market review; and consistent with the approach recommended by the European Commission, to which Ofcom is required to take utmost account and which has been applied in the majority of other EU member states. What is more, BT agrees that this approach continues to be justifiable under the criteria which Ofcom used in the previous market review and proposes to apply again in the analysis in this market review.

1.2. The competition impacts are a key criterion in Ofcom's assessment of the most appropriate cost standard. If anything, we consider that the case here is stronger than it was at the time of the last market review given not only BT's increased activity in the mobility space making use of a new MVNO agreement and its 4G spectrum licences acquired last year, but also recent press reports of other potentially significant MVNO entrants such as Carphone Warehouse and the Post Office. Making suitable returns on their investments in the mobile sector will mean that BT and other new MVNO operators will need to acquire scale and market share. Regulation needs to be set such that the ability to do so is not distorted. Related to this, and as the Consultation notes, there is some competition between fixed and mobile sectors. As such, a proper competition analysis requires that termination rates across both sectors are set according to consistent principles.

1.3. Mobile call termination rates therefore need to be set on the basis of a robust estimate of pure LRIC. BT has commented on a previous iteration of Ofcom's draft MCT LRIC model and welcomes the changes which Ofcom has made to the model consistent with our earlier comments. In this response, we focus on a number of further points which we consider should further reduce the estimates of mobile pure LRICs. In particular, we consider that:

i) the way the model predicts additional 2G capacity sites is unrealistic and artificially increases the cost estimates;

ii) the implementation of infrastructure sharing in the model is inconsistent with the degree to which we understand infrastructure sharing is in fact occurring, leading to too few sites being shared in the model and again leading to costs being overestimated;

iii) similarly, the way that the increasing tendency to use combined technology base stations (S-RAN) in radio network design has been taken into account in the model generates the unrealistic result that 4G technology continues to be costed at a premium as a result, even after other technologies are assumed to have been phased out: we propose more appropriate modelling approaches here;

iv) Ofcom has under-estimated the take-up of 4G handsets, meaning too little weighting is given to voice traffic delivered over 4G, leading to an over-estimate of LRIC of call termination;

v) Ofcom has taken insufficient account of the growth in tablet devices in its forecast of datacard penetration leading to an under-estimate of the volume of data traffic; and

vi) Ofcom's forecast data usage per subscriber is too conservative, particularly for 4G users, which means that voice (including termination) services are picking up an inappropriately large proportion of total network costs.

BT estimates that if all of the above were adjusted in the cost model in the way it proposes this would lead to the pure LRIC cost benchmark reducing by more than 20%, resulting in MTRs towards the bottom end of the consultation range.

1.4. The SMP remedies which Ofcom is proposing, including the approach to the resulting charge control, broadly represent a continuation of the current approach. BT agrees with two changes introduced by Ofcom in this market review. In particular:

i) BT agrees with the proposal to extend the charge control to all MCPs (which based on Ofcom's existing guidance should in theory have no practical impact on the rates which are charged compared to the current fair and reasonable approach but which would not rely on disputes being raised); and

ii) While BT considers that in general glide path approaches are to be preferred, in the specific context of this market review it is appropriate to set the charge ceilings at the level of estimated pure LRIC in each and every year: in particular because this would ensure that approach is consistent with the approach taken in respect of fixed termination rates and would therefore be technologically and competitively neutral.

2. Setting appropriate MCT rates for 2015-18

2.0. As Ofcom will be aware, BT supported the reductions in Mobile Call Termination (MCT) rates implemented in the previous mobile call termination market review. Setting mobile termination rates at the level of a pure long run incremental cost (LRIC) standard was subject to significant debate and fully assessed under appeal by the Competition Commission. In the face of such scrutiny this approach was upheld and BT fully supports continuing use of the framework currently in force. The basic case for setting rates in this way remains unchanged as was set out at length in the previous proceedings and summarised in Ofcom's current consultation document.

2.1 Framework for market assessment and setting remedies

2.1.1. Ofcom is proposing to continue using the existing market definition approach to assessing market power and remedies. As such, the operators found to have market power with respect to mobile call termination and reasons for these findings are broadly similar to those used for the existing charge controls. The remedy set and justification for them also remains the same, in particular with rates being set on a pure LRIC basis.

2.1.2. BT expects that, over the course the market review period, there will be network and technological developments which will make the distinctions between fixed and mobile networks less clear. We accept that the calling party pays regime and the numbering system currently make a charge control on calls to 07 numbers appropriate for this market review.

2.1.3. It should be noted though that both the market and technology continue to evolve with increasing use of over the top services and the development of fixed mobile convergence. The possibility of a complete removal of the call termination bottleneck in the mobile sector in the near to medium term seems unlikely. However, market evolutions may lead to a need to modify the market assessment in subsequent market reviews and as a result this would change what are the most proportionate and appropriate remedies. In particular, BT urges Ofcom to continue to review the retail impacts in future and ensure that wholesale regulation does not inhibit retail competition or limit the potential for innovative new tariffs and ways of delivering voice services. A wider remedy set (assessing, for example, the case for different approaches such as bill and keep) will be worth considering in market reviews assessing voice markets in future. As voice services evolve in future, regulation will need to be reviewed to ensure it is keeping pace and not hindering innovation or investment in this area.

2.1.4. We agree that the charge control on MCT for this market review should continue to be based on the pure LRIC standard. Key reasons for this include:

i) as a matter of technology neutrality it is important to ensure regulatory consistency between fixed and mobile (both of which are now set using this cost standard) and that, having made the switch to pure LRIC, a very compelling reason indeed would be needed to warrant the upheaval of changing back again;

ii) as Ofcom has acknowledged in its Fixed Narrowband Market Review (FNMR) statement[1], it is also important to ensure that there exist the minimum possible distortions between fixed and mobile technologies. Regulation should not create an unnecessary block to emerging technical and network convergence between the sectors: the proposed approach using pure LRIC is consistent with the regulation of fixed termination rates determined in the FNMR;

iii) this is the approach endorsed by the European Commission (EC) and set out in the EC termination rate recommendation[2];

iv) the LRIC cost standard is now widely implemented across Europe as a basis for setting mobile termination rates[3] and the EC and BEREC have set out objections to the continued or extended use of a LRIC+ standard in those small number of countries where this is the case[4];

v) the pure LRIC standard as a basis for mobile termination rates was subjected to significant debate and challenge in the last market review and the issue was the subject of a CC determination which found no reason to deviate from Ofcom's approach;

vi) further appeals[5] advocating LRIC+ as the appropriate standard failed;

vii) as set out in the Consultation the case for retaining the pure LRIC standard remains robust.

2.1.5. BT therefore continues to believe that pure LRIC remains the appropriate cost standard. Further detail on these issues is provided as appropriate in response to the specific consultation questions in the next section of this response.

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[1] FNMR statement, A9.53 available at http://stakeholders.ofcom.org.uk/consultations/nmr-13/statement/statement-summary.

[2] European Commission Recommendation 2009/396/EC of 7 May 2009 on the Regulatory Treatment of Fixed and Mobile Termination Rates in the EU, Official Journal of the European Union, L124/67 ("EC Termination Rate Recommendation"); available at http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:124:0067:0074:EN:PDF.

[3] According to Cullen International, of the 17 Western European countries, for example, only four still retain a LRIC+ cost standard. The other West European countries use approaches such as pure LRIC or benchmarking approaches. See "Mobile termination rates – moving towards pure LRIC?" published 2.6.2014 by Cullen International.

[4] See, for example, BEREC comments in relation to fixed termination rates in Estonia (available at http://berec.europa.eu/eng/document_register/subject_matter/berec/opinions/?doc=4409), or mobile termination rates in Germany (available at http://berec.europa.eu/eng/document_register/subject_matter/berec/opinions/?doc=3991).

[5] To the Competition Appeal Tribunal as a judicial review application of the CC determination and to the Court of Appeal on the Competition Appeal Tribunal decision.

2.2 Modelling pure LRIC rate

2.2.1 One of the key issues for this market review therefore becomes how to ensure robust and appropriate estimates for pure LRIC to provide the basis for setting MCT rates. Ofcom's underlying model estimating such costs for a hypothetical efficient mobile operator uses the same logic and construction as the model it has used to set rates in the current charge control period. A number of important issues have arisen on how to update this model given the inevitable changes in the market. BT has focused its comments on these changes based on its knowledge of the market generally and its understanding of network costs. BT has also commissioned Deloitte to specifically review the volume forecasts Ofcom has undertaken in this cost modelling process. This report is included as Annex 2 to this response.

2.2.2 As Ofcom is aware, BT has previously made comments on the overall approach to modelling mobile termination costs in earlier stages of this market review.[6] We welcome the changes which Ofcom has made to the model consistent with these earlier comments. We note Ofcom's arguments around basing the LRIC calculations on a 4G only network (which we consider would be consistent with the approach taken to modelling fixed termination costs). BT does not reiterate its continued view that this would be the most appropriate approach in this response. In taking an approach which averages the costs across existing technologies, BT does consider that Ofcom should include reference to the delivery of voice services over WiFi which EE and Three have recently announced they will be introducing before the start of the next charge control period and which O2 has already offered. The MNO radio network cost of delivering voice traffic in this way is essentially zero and this should be included in the blended cost across all technologies.

2.2.3 At this stage in the market review process, BT has concentrated on areas where the existing model and approach can be improved to correct what we consider are overestimates of the mobile termination pure LRIC. To the extent possible this response also indicates the specific changes BT considers Ofcom should make to the LRIC model in order to improve it.

2.2.4 The key areas where we consider that changes to the model are warranted are:

i) treatment of 2G capacity;

ii) approach to modelling infrastructure sharing (in urban and suburban geotypes);

iii) modelling of combined radio access equipment providing functionality across different technologies (Single RAN or S-RAN) implementation;

iv) the equipment cost trends used in the model; and

v) volume forecasts.

2.2.5 Each of these is considered below with Annex 1 setting out detailed explanations for these proposed adjustments to the modelling of 2G network costs. Annex 2 reviews the volume assumptions and proposes a number of adjustments to the forecasts.

[6] BT response "Mobile Call Termination Market Review 2015-2018: comments on draft model", 20 February 2014. http://stakeholders.ofcom.org.uk/binaries/telecoms/policy/mobile/bt-appendix-2014.pdf

2.2.6 Table 1 below sets out an estimate of the impact each of these issues has on the overall value of pure LRIC.

Table 1: Impact on base case MTR of proposed model changes

Issue	Estimated impact on base case MTR
Treatment of 2G capacity	c5% reduction
Network infrastructure sharing	c5% to c.15% reduction
S-RAN implementation	c1.5% reduction
Equipment cost trends	c12.5% reduction
Busy hour traffic profile	c5% reduction
Volume forecasts	c10% to c25% reduction
Combined impact	c20% to c30% reduction

i) Treatment of 2G capacity

2.2.7 There is no longer any space restriction that limits the number of frequencies that can be provided from a 2G site because equipment now has smaller space requirements than assumed in the 2011 model.

2.2.8 There is an error in the spectrum re-use factor which leads to unreasonable factors being used in the model. These need to be amended to reflect the true spectrum re-use factor. A value of 12 was used in the previous instances of the model and this should remain.

2.2.9 The spectrum that is available on a site, when site sharing is introduced, should be increased (to align with the assumed doubling of traffic in these cases).

2.2.10 The modelling should include an allowance for the use of AMR half rate and so avoid the need to provide additional 2G sites for a very limited period only (it is uneconomic to invest in 2G sites for use for a limited period only as this creates surplus future capacity). We suggest that 66% of all 2G voice traffic could move to AMR half rate to avoid additional infrastructure build. This will account for the instances where poor radio conditions prevent its use. The model should assume that any future investment in the growth of 2G sites is uneconomic and therefore should be removed from the modelling (with extra capacity provided on 3G and 4G sites).

ii) Infrastructure Sharing in Urban and Suburban 1 geotypes

2.2.11 BT notes that there is evidence of some infrastructure sharing already being undertaken by operators in these areas and therefore some sharing should be assumed in Urban and Suburban 1 geotypes in the model (as discussed in more detail in Annex 1, see A1.2 below). At the moment the model assumes an “all or nothing” with a 0 or 1 factor applied for infrastructure sharing in these exchange types.

2.2.12 For example, Ofcom references two national RAN sharing agreements, for example EE and H3G share their RANs though the joint venture company “Mobile Broadband Network

Limited" and Vodafone and Telefonica share their RAN through the joint venture company "Cornerstone Telecommunications Infrastructure Limited" (CTIL)[7].

2.2.13 In June 2012, Vodafone and Telefonica announced their intention to strengthen their network collaboration, and plans to "pool basic infrastructure to create one national grid of 18,500 sites".[8] However, in the 2014 MCT base case only around 7,900 macrosites are required in the geotypes eligible for sharing.

2.2.14 This suggests that network sharing already occurs in Urban and Suburban 1 geotypes, especially for 2G and 3G and so the model should be adapted to reflect this.

2.2.15 We consider the extent of infrastructure sharing could be implemented through use of a factor of 50% in these geotypes, which would reflect the likelihood of infrastructure sharing in around one-half of these geotypes. A simple approach to achieving this would be to assess the impact of sharing in all areas and apply a proportion of the additional saving to reflect the level of sharing in Urban and Suburban 1 areas.

iii) S-RAN costs

2.2.16 BT agrees that the modelling approach should take account of the use of "Single Radio Access Network" (S-RAN) technologies. These are, in practice, how mobile network operators are now building their radio networks. However, the S-RAN cost allocation used in the model, between the three different technologies, includes some over-simplification which inflates costs. Further, some 4G only sites have additional costs associated with providing 2G services included when this will be unnecessary. This inflates the cost of 4G infrastructure. The cost premium (for supporting 2G traffic) will be unnecessary once all 2G traffic has migrated away, yet this persists within the cost model.

2.2.17 The treatment of a high proportion of common S-RAN costs being allocated between 2G:3G:4G on an equal basis has the result that excessive costs are allocated to 2G as traffic on that platform declines. BT suggests that these costs should be recovered from volumes across all three platforms rather than be allocated to technology first.

iv) Equipment Cost Trends

2.2.18 Although the 2014 MTR model has the capability to model cost trends, much of this capability has not been used within the current implementation of the MCT model. Several of the future cost trends are simply assumed to track inflation. This results as the model uses "real terms" cost modelling, with many items of operating costs and capital expenditure having a zero (real terms) cost trend. An exception is property costs which are assumed to increase in real terms.

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[7] Paragraph 2.63, Ofcom's MCT review 2015-18 consultation.

[8] See on-line at: http://pressoffice.telefonica.com/jsp/base.jsp?contenido=/jsp/notasdeprensa/notadetalle.jsp&id=0&idm=eng&pais=1&elem=18249

2.2.19 BT considers it is inadequate to assume zero or near zero real terms price trends (or, in other words increases in nominal prices) in a world where a significant proportion of the cost base relates to electronic equipment which tends to become cheaper in real terms over time. We consider operating cost trends should also reflect potential efficiency gains.

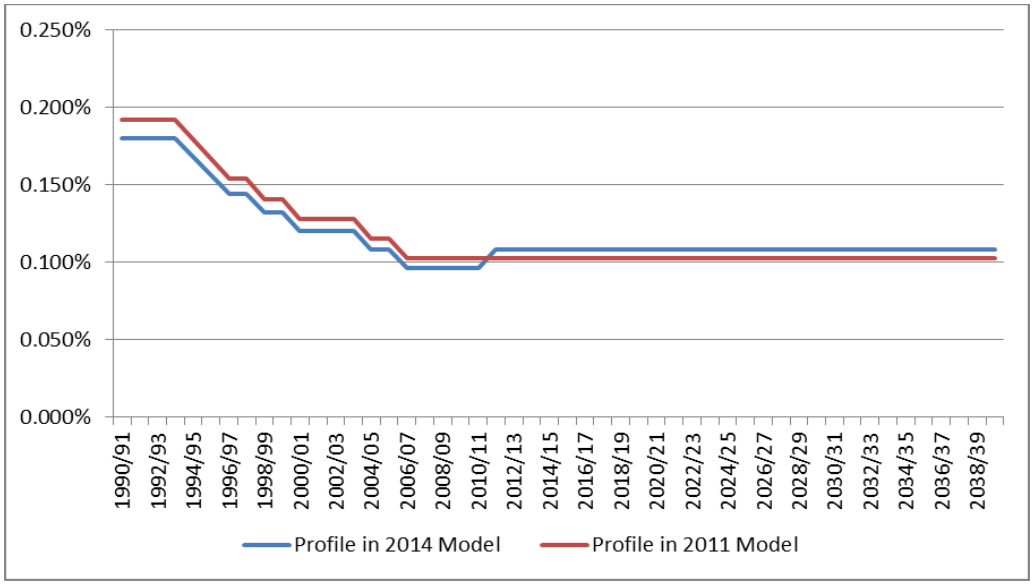
2.2.20 Ofcom's Fixed Termination Rate model evaluated cost trends for electronic equipment and found that the cost trends for these items were falling at between 1% and 3% per annum in nominal terms[9]. In other words the trend rate in costs was for a decline in costs of between 3% and 5% per annum in real terms.

2.2.21 This could be readily addressed in the 2014 MCT model by incorporating price declines in real terms to both assets and operating costs where this relates to electronic equipment, to reflect the impact of technical progress on the cost base of these items. This will ensure that a realistic efficiency assumption is incorporated into the MCT model and the resulting charge controls.

2.2.22 It is also the case that the Fixed Termination Rate model had cost inflation modelled up until 2025/26, some thirteen years beyond the base year of 2012/13. A similar approach should be adopted in the Mobile Model. BT suggests that cost reductions are included at a rate of between 3% and 5% in real terms for electronic equipment capital and operating costs. These price reductions should be included in each year up until 2026/27 to ensure a consistent approach is adopted with the Fixed Termination Rate model.

v) Busy hour traffic profile

2.2.23 Figure 1: Comparative profile of proportion of voice and SMS traffic in one busy hour



[9] See figure 17 on page 21 of Ofcom's model documentation for the Fixed Narrowband Market Review http://stakeholders.ofcom.org.uk/binaries/consultations/nmr-2013/statement/Annex_7_final.pdf

2.2.24 The traffic profile shown in Figure 1 shows the proportion of total quarterly voice and SMS traffic in one busy hour. This shows a steady decline in both 2011 and 2014 models until 2011/12 when the 2014 model shows a step-change upwards.

2.2.25 This increase in 2011/12 is due to an increase in the proportion of traffic in the busy hour of each busy day to 9% in the 2014 model, following a trend downwards to 8% in 2006/7. This step-change in the traffic profile seems counter-intuitive, and Ofcom should consider whether the change in the profile is justified.

2.2.26 In the case of data traffic, the 2014 MCT model has the proportion of data traffic in a busy hour consistently above the 2011 Model. This is due to a revision of the proportion of data traffic in the busy days upwards from 72% to 100%.[10] This implies that with 250 busy bays per year, there is no traffic in the remaining 115 days, which appears unrealistic.

vi) Volumes

2.2.27 A detailed review of the volume forecasts in the 2014 MCT model is set out in Annex 2, the "Volume forecasts in the Ofcom MCT model" report written by Deloitte ("the Deloitte Report"). This shows Ofcom's forecast volume of 4G handset subscribers is very much lower than the current level of 4G subscribers observed in the market. Operators are also anticipating higher and more rapid penetration of 4G subscribers meaning that the 2014 MCT model seriously under-estimates 4G subscriber volumes (see scenarios 1 and 2 in the Deloitte Report).

2.2.28 The data usage of 4G per subscriber is also significantly higher than forecast. Deloitte estimate that Ofcom may have under-estimated 4G data usage by a factor of between 4:1 and 6:1 (see scenarios 3 and 4 in the Deloitte Report).

2.2.29 A third area where volumes appear to have been underestimated concerns the growth in tablet devices that are connected to the 4G network. Ofcom's 2014 MCT model revised downwards the volume of datacards compared with the 2011 MCT model. However, in making this revision, Ofcom appears to have overlooked the potential growth of SIM-enabled tablet devices. For example, Deloitte predict datacard penetration rates could reach 20%, based on reports by Mintel and Enders Analysis, significantly higher than the 2014 MCT model (see scenario 5).

2.2.30 Deloitte has calculated the combined impact of the three volume forecasting issues within scenario 6 which indicate a reduction in MTR of 11.7% in 2015/16 and 25.5% in 2017/18. The volume forecasts were then moderated by limiting the total data forecast in Deloitte's modelling to match a total data traffic forecast made by Cisco. This is shown in scenario 7, where the impacts were moderated to a 10.7% reduction in 2015/16 and a 16.6% reduction in 2017/18. BT has therefore concluded that updating the volume forecasts to align with market data on 4G uptake and data usage will result in a reduction in the MTR rates of between 10% and 25% compared with the MTR rates set out in the consultation.

[10] See the "Cost Drivers" sheet in the "Network" module, cells F10 to F12 give the proportion of traffic in busy days for voice, messaging and data traffic. The data parameter was adjusted to 100% following Ofcom's calibration exercise.

2.3 Implementation of the 2015-2018 charge control

2.3.1 Given the specific circumstances relating to mobile call termination in this review, BT agrees with the overall approach proposed to implementing the charge controls. The key issue here relates to the speed of adjustment to the updated estimates for pure LRIC.

2.3.2 Ofcom's proposed approach of setting MCT rates with reference to the LRIC outputs of Ofcom's MCT model in each and every year of the control is appropriate and proportionate in the specific context of this market review.

2.3.3 Ofcom's usual approach to setting a charge control is to implement a glide path from current rates at the end of the previous charge control to an appropriate cost based rate over the years of the charge control period. BT believes this is a sensible default approach and will in most cases have superior incentive properties, in particular when the relevant cost standard being used to determine prices is based on fully allocated costs.

2.3.4 In the context of this market review, BT recognises the two-sided nature of the mobile call termination market and notes that the Competition Commission has commented that:

> *'…as the profitability of investment decisions would not be affected by, or not greatly affected by, the level of termination rates, the length of the glide path should not significantly affect investment incentives."*[11]

2.3.5 The approach which Ofcom is proposing of setting the MCT charge cap at the level of estimated pure LRIC in each year of the control period is consistent with the approach taken in the last FNMR with respect to fixed termination rates. In the particular instance of the current market review and in light of the analysis which Ofcom sets out in the Consultation, the following are also relevant:

i) BT recognises that maintaining mobile rates at the estimated pure LRIC level is not unduly disruptive as it is simply a perpetuation of the current approach (MCT rates were reduced to pure LRIC in April 2013 and have been maintained at that level this year following the CC's determination);

ii) in addition, the proposed approach will further reduce the absolute asymmetry between fixed and mobile termination rates, which BT welcomes and will promote competition between the fixed and mobile sectors; and

iii) this approach is consistent with the EC recommendation that termination rates should be "implemented at a cost-efficient, symmetric level by 31 December 2012", subject only to objective cost differences. [12]

More detailed comments on other elements of the proposed implementation approach are set out in response to consultation question 8.1 below.

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[11] Paragraph 5.70 in The CC Determination, February 2012, available at http://www.competition-commission.org.uk/assets/competitioncommission/docs/appeals/telecommunications-price-control-appeals/final_determination.pdf

[12] Article 11 of the EC Termination Rate Recommendation. See also Article 2 which sets out the basis on which costs should be evaluated.

3. Response to specific consultation questions

Question 3.1: *Do you agree with Ofcom's view of the relevant market? If not, please explain why.*

3.1 Subject to the caveats set out in Section 2.1 above, we do not object for this market review to continuing use of this established view of the market for MCT over the period 2015-18.

3.2 Under the calling party pays (CPP) system there is no substitute for terminating a voice call on the network of the subscriber's chosen provider, so the relevant economic market is that for all calls that terminate on the individual network(s) in the UK.

3.3 This is based on the similar characteristics – control of the number range – to the definition for fixed terminating calls set out in the FNMR and helps to provide consistency across the two markets. This is important particularly given the fact that it will become increasingly difficult to identify whether a call made to a mobile number in practice uses a fixed or mobile network given the increasing use of fixed infrastructure by mobile communications providers (MCPs).

Question 5.1: *Do stakeholders agree with our assessment of the harm that would result from a lack of effective competition in MCT markets?*

3.4 BT agrees that, in the absence of regulation, MCPs would have the ability and incentive to set MCT rates above the competitive level. This coupled with the ability to refuse to supply on fair and reasonable terms and lack of certainty in MCT costs incurred by providing calls to mobile, would lead to a distortion of competition, with a corresponding detrimental impact on consumers.

Question 5.2: *Do you agree with our assessment that ex-post competition law would not be sufficient to address the competition problems we have identified, and that therefore deregulation is not a regulatory option?*

3.5 As discussed in the Consultation the issue with MCT markets, at present, is the continuing market power that MCPs have in these markets. Although this may be overcome if the threat of entry were credible, the considerable barriers to entry in this market mean that there is no incentive placed on any individual MCP to deliver a competitive outcome.

3.6 The EC recommendation on relevant markets susceptible to ex ante regulation identifies wholesale call termination to mobile networks as one such market.[13] The current draft replacement recommendation[14] retains termination markets, including for the mobile sector. The draft Explanatory Memorandum[15] to this document (and the related debate

[13] See Market 7 in "Commission Recommendation on relevant product and service markets within the electronic communications sector susceptible to *ex ante* regulation in accordance with Directive 2002/21/EC of the European Parliament and of the Council on a common regulatory framework for electronic communications networks and services" (2007/879/EC); published in the OJEC, 28.12.2007 L344/65.

[14] Available at https://ec.europa.eu/digital-agenda/en/news/draft-revised-recommendation-relevant-markets

[15] Available at https://ec.europa.eu/digital-agenda/en/news/draft-revised-recommendation-relevant-markets

which has led up to the current draft) considers the impact of new developments such as VoIP but clearly considers that these developments are not yet at a stage which changes the basic approach. Ofcom also needs to take the utmost account of the EC recommendation on call termination rates[16] which is also based on the same basic competition analysis recognising the relevance of pricing based on calling party pays.

3.7 As such, both the current UK circumstances and the European framework continue to justify the imposition of ex ante regulation. Ex post competition law is by definition reactive and would not address the competition and welfare issues which Ofcom has identified in the Consultation (and previous mobile termination market reviews). On-going regulation therefore remains appropriate to counteract the incentives MCPs have to raise rates and increase regulatory certainty for all communications providers.

Question 5.3: *Do you agree with our proposal to impose an obligation to provide network access on reasonable request on all MCPs with SMP? If not, please explain why.*

3.8 The requirement for all MCPs with SMP in mobile termination markets to provide network access on reasonable request is an appropriate constraint to impose. This is consistent with the FNMR where all fixed network providers are required to provide network access on reasonable request. This is an important underpinning of the interconnection regime and assists in maintaining end to end connectivity.

Question 5.4: *Do you agree with our proposal to impose a price transparency obligation on all MCPs with SMP? If not, please explain why.*

3.9 Ofcom is not proposing any change to the existing arrangements for transparency concerning mobile call termination rates. BT is not currently aware of any significant issue arising over the course of the current charge control period which would require a change to the relevant SMP condition. Even if it were the case that not all MCPs found to have SMP were complying with these requirements this in itself is not a reason to change the SMP condition itself (but may raise issues of compliance monitoring). BT notes that its compliance with this transparency condition is achieved by publishing the relevant rates on the Carrier Price List. BT does not consider that there are any significant costs in complying with this obligation and that the transparency it provides is useful. As such, BT agrees with the proposal in the Consultation.

Question 5.5: *Do you agree with our proposal to impose a non-discrimination obligation on the four largest MCPs, but not on smaller MCPs? If not, please explain why.*

3.10 BT agrees that the current non-discriminatory obligation on the four largest MCPs remains appropriate. Further there is no need for such an obligation on other MCPs (nor any evidence that the lack of such an obligation has created any issues to date).

3.11 In particular, BT does not consider that there is any practical or theoretical reason to consider that such other MCPs would be able to gain any material advantage through such discrimination given their relative size in the market. If anything, therefore, extending such

[16] EC Termination Rate Recommendation.

an obligation would not be in line with the statutory obligation to impose regulation only where it is proportionate and targeted only at cases in which action is needed.

Question 5.6: *Do you agree that our proposal to impose a charge control on the four largest MCPs is appropriate? If not, please explain why.*

3.12 BT agrees that there has not been any significant change in market circumstances with respect to the four largest MCPs since the last market review. As such, a charge control condition for MCT provided by these operators continues to be proportionate and appropriate for the reasons set out in the Consultation and in previous market reviews. In particular, given that fixed termination rates are subject to a charge control, it would not be in the interests of wider competition or technologically neutral for the charge control of the analogous rates to be lifted from the mobile sector. Further, Ofcom's approach also ensures consistency with the EC Termination Rate recommendation and the approach taken by many other European national regulators.[17]

Question 5.7: *Do you agree that our proposal to impose a charge control on all other MCPs with SMP is also appropriate? If not, please explain why.*

3.13 Given the simplicity of the form of the existing (and proposed) charge control, this approach seems proportionate. The existing fair and reasonable requirement on MCPs other than the four network operators effectively requires compliance with the same overall cap, in combination with the guidelines Ofcom issued. Making all MCPs subject to the same cap improves regulatory certainty and reduces the requirements for costly regulatory monitoring and potential disputes. BT takes this view on the basis that it is not aware of there being any evidence or need to rely on the flexibility which the current guidelines based approach theoretically allowed.

Question 6.1: *Do you agree that the above framework is the appropriate one? If not, please explain why.*

3.14 As noted in paragraph 6.19 of the Consultation, Ofcom is proposing to use the same basic framework, based on the same four criteria, which was used in the last market review. Based on the similar market analysis discussed above there do not appear to be any reasons for making significant changes to this overall framework in this market review. Its continued use promotes appropriate regulatory consistency. We also note that the basic framework itself was not subjected to any significant challenge in the various appeals of the last market review, which were more focused on how the criteria were applied to determine the appropriate cost standard.

Question 6.2: *Do you agree with our analysis and views on allocative efficiency? If not, please explain why.*

3.15 BT agrees that an assessment of the allocative efficiency impacts does not provide any justification for moving away from the current pure LRIC approach. As Ofcom highlights in

[17] See the discussion in Section 2.1 above.

Annex 9 of the Consultation there is no clear evidence that the shift from a LRIC+ cost standard has led to any significant increase in UK retail mobile prices. As discussed in section 6 of the document and at length in the Competition Commission proceedings concerning the last market review, even if there were a rebalancing of prices which led to some increase in retail prices as a result of the waterbed effect, the impact on overall allocative efficiency is ambiguous at best. Figure A9.10 in the Consultation shows a steady, if modest, increase in mobile originated calls (i.e. on and off net mobile total call volumes) between 2010 and 2013: that is, over the period during which the switch to the pure LRIC cost standard was put into effect.

3.16 Further it is clear from the information set out in the Consultation that there has not been any significant fall in mobile subscriptions or ownership. As shown in figure A9.14 of the Consultation there has been an increase over the period from 91% to 93% of the population that personally uses a mobile phone. While there appears to have been some restatements involved in the total subscription quarterly figures which Ofcom publishes, the total number of subscribers has also increased over the course of the current charge control period from 80.8 million subscribers in the second quarter of 2011 to 83.05 million in the fourth quarter of 2013. Further, all of the main mobile network operators have been reporting increasing numbers of 4G subscribers. As such, we agree that the allocative efficiency analysis does not provide a justification for moving away from the current pure LRIC cost standard (we discuss the impact on fixed to mobile pricing in response to consultation question 6.5 below).

Question 6.3: *Do you agree with our analysis and views on dynamic efficiency? If not, please explain why.*

3.17 As with allocative efficiency, an analysis of potential dynamic efficiency impacts does not provide any justification for moving away from the current pure LRIC cost standard. While there is some volatility inherent in year on year comparisons of capital expenditure it is clear that the level of the mobile sector investment has continued. All the network operators are investing significantly in rolling out and promoting 4G networks. Indeed, Figure 5 of the Consultation shows that total capital expenditure of all four largest MNOs appears to have increased between 2011 and 2013. There has certainly been no material negative impact. Under the current regime both EE and Three have been able to increase their EBITDA margins as well (both in absolute and percentage terms).[18] BT also notes that compared to the overall scale of investment in the mobile sector, the relevant impact on mobile operators of the difference between LRIC+ and LRIC is very modest (as highlighted in the last bullet of paragraph 6.49 of the Consultation).

3.18 Further, Ofcom's assessment of dynamic efficiency in the Consultation only focuses on the potential negative impacts. The conclusion that the dynamic efficiency assessment does not support a case for changing the cost standard is further reinforced when the impact on communication providers other than the largest MCPs is also taken into account. Reducing the net payments from the fixed to mobile sectors could improve investment incentives in

[18] As shown in Figure 9 of the Consultation, O2 has also increased its EBITDA margin in percentage terms.

fixed network assets. BT continues to invest in rolling out its fibre network which itself creates significant net benefit to the UK economy. Further, BT is also investing in developing its mobile business and using the spectrum licences in the 2.6GHz band acquired in the auction last year. Pure LRIC based MTRs improve competition (see the response to the next consultation question) and hence will also improve the investment incentives of newer competitors such as BT in wider mobile markets.

Question 6.4: *Do you agree with our analysis and views on competition impacts? If not, please explain why.*

3.19 The Consultation discusses the potential competition impacts of different forms of MCT regulation using the same framework under which these issues were discussed in the previous market review. Again these broad headings were not substantially disputed in the last market review and the conclusions Ofcom reached in the 2011 Mobile Call Termination market review statement were broadly upheld by the Competition Commission. The key question which therefore arises is whether any changes have occurred which would necessitate considering any changes to the decision reached. The overall conclusion reached in 2011 was that the competition effects justified a move to pure LRIC mobile termination rates. This was reinforced by the FNMR findings that competition effects also justified a move to a pure LRIC cost standard in the fixed context. BT does not consider that there have been any material changes to the nature and scope of competition in the mobile sector which would justify any change to the basic conclusion.

3.20 If anything, we consider that the case here is stronger given the entry of BT (and potentially other significant MVNO entrants) into providing more retail services [✂]. BT also notes that there are other high profile potential new MVNO players also announcing plans to enter the retail mobile space. Newer forms of competition in the mobile space will need to be able to compete across all market segments on a level playing field in order to be sustainable and effective. Regulation needs to be set in such a way that the ability of these competitors to succeed is not distorted. For all the reasons set out in detail in the last market review and associated appeals, and summarised and discussed in paragraphs 6.55 to 6.80 of the Consultation, this therefore strengthens rather than weakens the case for continuing to use a pure LRIC cost standard.

3.21 Further, as the Consultation also notes there is some competition between fixed and mobile offerings (even if this is not considered sufficient to warrant a change to the overall SMP analysis). As such ensuring that fixed and mobile termination rates are set based on the same principles and that the absolute difference between them is minimised is also crucial to ensuring that there is a minimum possible regulatory distortion to competition of this form. This is likely to become increasingly important during this market review period to the extent that there is commercial or technological fixed mobile convergence.

3.22 We support Ofcom's confirmation of its finding that the analysis of competition effects gives no reason to change the current pure LRIC approach. On the contrary, future market reviews may need to consider if this analysis warrants changes to the approach to remedies

which further enables competition rather than leads to any increase in what mobile termination rates would otherwise be.

Question 6.5: *Do you agree with our analysis and views on the impact on vulnerable consumers? If not, please explain why.*

3.23 BT agrees that vulnerable customers do not appear to have been materially worse off under a pure LRIC MTR regime than under the previous LRIC+ regime. As discussed above, competition has been enhanced which has also protected vulnerable customer groups as well as customers more widely. A vibrant MVNO sector in particular means a range of competitive tariffs is available across both PAYG and post-pay sectors (including SIM only). Cheap handsets are also still available (as noted in the Consultation). It is notable that there is now also a growing segment of cheaper smartphones evolving (for example, the EE Kestrel handset, which is available for no up-front fee on cheaper contracts[19]).

3.24 Fixed customers are also better off under reduced MTRs than they would otherwise have been. This can be seen in a number of ways. As Ofcom notes in its analysis of the impacts of pure LRIC based regulation on vulnerable customers (paragraphs 6.90-6.94 of the Consultation), mobile termination rates at the level of pure LRIC are likely to lead to lower fixed-line prices, albeit not necessarily just to fixed-to-mobile (F2M) call prices. BT agrees and below sets out further evidence to that provided in Annex 9, supporting Ofcom's contention that LRIC MTRs have led to benefits for fixed-line consumers, including vulnerable customers.

3.25 BT passed through directly to its headline F2M prices the initial, and most significant, drop in MTRs under the current control, in 2011 – that is, 100% pass-through. This meant that in May 2011, our customers saw a 13% reduction in daytime call prices (from 13.0ppm to 11.3ppm) and a 27% reduction in the evenings (from 7.0ppm to 5.3ppm). This reduction will have also directly benefitted vulnerable customers on our *BT Basic* package who make F2M calls.

3.26 The further MTR reductions over the remainder of the control period have helped to keep our standard F2M prices at around the same level in spite of inflation. [✂][20].

3.27 As Ofcom recognises in the Consultation competition for fixed-line consumers has shifted increasingly to bundles and call packages where the price of calling a mobile is but one element of a much larger value proposition.

3.28 Ofcom's Table A9.2 references fixed operators' call bundles that include F2M calls. Following research and trials of various options, including one with all-inclusive calls, BT launched in April 2013 our *Unlimited Anytime Calls* (UAC) package which for £7.50 per month includes half-price F2M calls (that is, 6ppm). [✂]

[19] See http://shop.ee.co.uk/mobile-phones/pay-monthly/gallery?search=%3Abest-sellers%3Abrand%3Abrands_ee&

[20] [✂]

3.29 BT expects to announce, on 22nd August, a set of price changes, taking effect in December 2014, one of which will increase the price of most call types, including F2M calls, by around 6%. This uniform increase will maintain the price differential between calling a mobile and calling a UK landline.

Question 6.6: *Do you agree with our analysis and views on regulatory and commercial impacts? If not, please explain why.*

3.30 Given Ofcom's estimate of the decline in the LRIC+ standard, the waterbed effect and the lack of significant detrimental effects on the overall market of the current pure LRIC based charge control, we agree with Ofcom's conclusion here. Specifically there are no material regulatory or commercial impacts which would point towards a reversal to using a LRIC+ cost standard. Further this is consistent with the approach taken by the majority of EU national regulatory authorities and in line with the EC recommendation on termination rates. As discussed in Section 2 above the approach is also consistent with the way in which fixed termination rates were set in the FNMR. As discussed in response to consultation question 6.3 above there also do not appear to have been significant detrimental impacts on investment incentives which further reinforces the view that overall commercial impacts of continuing to use a pure LRIC cost standard are not materially detrimental.

Question 6.7: *Do you agree with our proposal that LRIC should continue to be the appropriate cost standard? If not, please explain why.*

3.31 Based on the discussion above, BT agrees that pure LRIC should continue to be the cost standard used to set mobile termination rates. This is the case in particular as a result of the analysis on each of the relevant criteria (discussed in the response to consultation questions 6.2 to 6.6 above and for the reasons set out in Section 2.1 of this response).

Question 7.1: *Do you agree with our proposed modelling approach as discussed in this section, the supporting annexes and the 2014 MCT model? If not, please discuss the specific proposals that you disagree with.*

3.32 Ofcom's modelling approach and the 2014 MCT model overestimate costs and the investment necessary to deliver forecast volumes with the consequential result that the Mobile Call Termination rates have been overstated. The modelling approach has also resulted in a significant under-estimation of the take-up of 4G which impacts on the technology mix of 2G:3G:4G subscribers and also the impact 4G take-up has on forecast data volumes.

3.33 BT therefore considers that there are a number of areas where the approach can be improved and more robust estimates for the relevant cost standards to be derived. These are discussed in Section 2.2 of this response with relevant additional detail provided in the Annex 1 to this response for network investment and Annex 2 (the Deloitte Report) for volumes forecast. In summary, we consider the modelling approach to the following issues could be improved:

i.) treatment of 2G capacity;

ii.) approach to modelling infrastructure sharing (in urban and suburban geotypes);

iii.) modelling of S-RAN implementation;

iv.) the equipment cost trends used in the model

v.) busy hour traffic profile; and

vi.) volume forecasts.

Question 8.1: *Do you agree with our proposed approach to implementing the MCT charge control? If not, please discuss the specific proposals that you disagree with.*

3.34 Section 8 of the Consultation sets out a number of proposals, relating to the practical implementation of the MCT SMP remedies. BT broadly agrees with the approach which Ofcom is proposing to take but we set out below a number of comments on the detail and implications. BT has set out in paragraph 2.1.4 and in Section 2.3 above the reasons why it supports Ofcom setting MCT rates at the level of pure LRIC in each and every year of the charge control: this reasoning is not repeated here.

3.35 In relation to the other implementation issues set out in Section 8 of the Consultation BT has the following comments:

i.) While BT has supported the use of RPI in other market reviews (as an index relevant to key input costs in the sector), we recognise the benefits of consistency between market reviews. As noted in paragraph 8.40 of the consultation CPI is now used in FAMR, LLU, WLR and WBA charge controls. If it is assumed that there is a shift towards using CPI in this market review, then clearly this change will need to be implemented in a transparent and appropriate way.

ii.) BT supports the proposed 3 year duration of the charge control in line with other electronic communications charge controls and the European recommended approach. In future reviews in relation to fixed and mobile termination rates there may be a case for considering whether the review periods should be aligned, especially if alternative remedies are to be considered.

iii.) Use of a technology and operator neutral rate is beneficial as it creates a level playing field across the market.

iv.) BT agrees with the proposal to apply a single maximum cap on MTRs on all MCPs with SMP (which based on Ofcom's existing guidance[21] should in theory have no practical impact on the rates which are charged compared to the current fair and reasonable approach but which would not rely on disputes being raised). The alternative of an obligation that sets MTRs at fair and reasonable terms has proved burdensome in terms of the effort required to agree rates in the fixed world, and can easily result in higher termination rates which disadvantage the consumer and the CPs charging

[21] "Wholesale mobile call termination: guidance on dispute resolution in relation to fair and reasonable charges; Statement" Ofcom published on 5 April 2011.

lower termination rates. BT also notes the history of flip-flopping in the mobile world, and therefore supports the use of a single maximum in preference to a weighted average basket as a way to preclude this practice.

A1. **Annex: Detailed cost modelling issues**

This annex provides further detail on the detailed modelling issues discussed in Section 2.2 of this response, which collectively lead to an overstatement of the appropriate pure LRIC cost benchmark.

A1.1 2G Capacity Analysis

A1.1.1 Within the MCT 2014 model a large proportion of the 2G radio network is assumed to be required for capacity build. The main factors driving this capacity requirement is the assumed capacity of a base station. In our view, this capacity calculation is based on unrealistic assumptions in some areas and is erroneous in others. In particular the following points should be noted.

A1.1.2 When infrastructure sharing occurs in the model, the traffic assumed to be carried in an individual sector is doubled (see Row 50 of the "Nw-2G" tab in the Network Module of the model). However the capacity available to the sector remains unchanged. This has occurred due to an unjustified manipulation of the spectrum re-use factor (see Row 112 of the "Params-2G" tab in the Network Module). This leads to the capacity limited by spectrum to be set to the capacity limited by space (see Row 141 of "Params-2G" tab, labelled as "space limited" on Row 119 of "Nw-2G" tab). It is highly unrealistic to assume that two operators would seek to share network infrastructure if this leads to a need for new capacity sites to be built. It is worth noting that this anomaly only arises in relation to 2G in the model and not with respect to 3G.

A1.1.3 When network sharing is not implied by the model, the manipulation described in the previous bullet effectively halves the radio capacity of a site. This is due to a combination of (i) the reduction in spectrum available due to refarming to 4G use and (ii) the alteration of the spectrum re-use factor. Since the limiting factor in the model is the "space limit", the refarming of spectrum should have no effect at all.

A1.1.4 We further consider that the "space limit" on the size of a 2G base station is unreasonable. In reality we would expect that where a capacity increase, beyond the capability of an existing site, is required this will be in areas where the early deployments of 2G equipment took place. Such deployments would typically have used 19" racks for base station equipment. Modern base station equipment is significantly smaller, with the capability implied by the Ofcom assumptions now available in a single 25 litre volume unit.[22] As a result, use of more up to date equipment would mean that the space limit will not be a binding constraint and should be removed. The only practical limit will be the spectrum available.

A1.1.5 Ofcom's MCT Model has a modelled peak of 2G site build in 2014/15 and 2015/16 before 2G demand dies away. With the expectation that the demand for peak 2G capacity will

[22] See for example http://nsn.com/portfolio/products/mobile-broadband/single-ran-advanced/flexi-compact-base-station

only exist for two years, it is reasonable to assume that operators will seek to compress as much traffic as possible into the existing available spectrum. BT notes that mobile operators were referring Ofcom to the deployment of dynamic AMR half rate for voice services several years ago. BT understands that operators are extensively using this technique to double voice capacity in good radio conditions[23]. Given these ongoing enhancements to the GSM standard creating greater capacity over existing spectrum and infrastructure, it is unrealistic to assume (as Ofcom's model currently does) that the 2G network cost profile is based on additional site build to maintain full rate 2G voice services.

A1.1.6 The data component of the 2G traffic is converted to "equivalent Erlangs" (see Row 67 of "Nw-2G" tab) and then has the Erlang B formula applied to the total. This is, in effect, running a best effort data service at the same level of occupancy as a voice service. The same approach is not extended to 3G services, where the data component is removed before the Erlang B calculation is applied. In reality a certain proportion of the best effort data service will run in the excess capacity required to meet the voice grade of service, improving the overall utilisation of the service[24]. In the current implementation the requirements for 2G capacity will be exaggerated. The approach to mixing voice and data services should be altered to be in line with that employed in the 3G sections of the model.

A1.1.7 The above points lead to the following proposed specific changes to the model.

i.) Remove the space restriction from the limit on the number of frequencies apply to the sector.

ii.) Remove the error that has been introduced, changing the spectrum re-use factor to unreasonable values (33 in some cases).

iii.) Increase the spectrum that is available on a site when site sharing is introduced (to align with the assumed doubling of traffic in these cases).

iv.) Include an allowance for AMR half rate to avoid the need to provide additional 2G sites for a very limited period. We suggest that 66% of all 2G voice traffic could be assumed to move to AMR half rate to avoid additional infrastructure build. This will account for the instances where poor radio conditions prevent its use. We note that VAMOS might not be deployed in a mature UK network unless the costs of doing so are significantly less than the construction requirements of additional 2G capacity. At the moment the model implies such construction requirements.

[23] See footnote on page 54 of http://stakeholders.ofcom.org.uk/binaries/consultations/spectrumlib/responses/Telefonica_O2_UK.pdf.

[24] BT also considers that it is unclear to what the TRX utilisation and Macro utilisation factors (included on the "Utilisation" tab) relate. These serve to further reduce the capacity of the sector in addition to any reduction arising from the Erlang B calculations.

A1.2 Infrastructure Sharing

A1.2.1 Network sharing has been restricted to areas outside Urban and Suburban 1 geotypes. The Consultation states that the reason for approach is provided in the Analysys Mason report (Annex 12 of the Consultation). The relevant detail underlying this approach in that report has been redacted.

A1.2.2 Within the baseline model, in 2015/16, this assumption implies that 55% of the macrocells are not eligible for network sharing (which results from analysing Rows 476 to 482 of the "Nw-other" tab). Given the announcements that have been made by mobile operators concerning the benefits of network sharing to their overall cost bases, this level of exclusion of network sharing from the calculations is not credible:

A1.2.3 For example, the Vodafone/Telefonica network share has been started to result in a network where "both companies will have access to a single grid of 18,500 masts".[25] In 2015/16 the model predicts 17,900 macro sites are required. If only 45% of these are shared it is difficult to reconcile this assumption with the statements of the total available sites from the mobile operators.

A1.2.4 Recent announcements from EE indicate that their 4G network sharing arrangements with Three will be restricted to passive elements. However the model should reflect the full extent of sharing during the period covered by the model. The creation of the joint network (operated by the joint venture MBNL) involved full (active) network sharing for 3G. This was certainly not restricted to 45% of the network and it seems unlikely that the 4G passive network share will be restricted in this way.

A1.2.5 From the comments above it is proposed that the model is amended to include a greater proportion of network sharing to reflect reality. This could be achieved either by redefining the geotypes or an estimate achieved by assessing the MTR if network sharing was enabled in all areas and then assigning a percentage of this change to account for sharing in Urban and Suburban 1 areas.

A1.3 Single-RAN

A1.3.1 BT notes the description in Annex 12 of the Consultation (the Analysys Mason report) of the changes made to the S-RAN treatment in the model. In particular, this involves distribution of the Opex components of the technology between the three original technologies with no attribution for traffic levels. This, combined with the assumptions regarding the opex price premium of an S-RAN site compared to a single technology site,[26] results in additional 4G opex cost being moved into the future.

[25] See the press release at: http://pressoffice.telefonica.com/jsp/base.jsp?contenido=/jsp/notasdeprensa/notadetalle.jsp&id=0&idm=eng&pais=1&elem=18249

[26] See Rows 454 & 455 of the "Unit Expenses" tab in the Cost module.

A1.3.2 In our February 2014 comments on the draft model we pointed out the inadequacy of an approach that sought to mimic network build effects by the manipulation of the costs.[27] Within the Network Module of the MCT model it is possible to identify those sites which are shared between multiple technologies in a number of combinations on a year by year basis. Such an analysis shows that the current modelling approach implies a cost penalty associated with the use of S-RAN equipment on a 4G site. This arises as it bears the cost of what is assumed to be more expensive 2G only equipment. This cost penalty is levied on sites that are 4G only.

A1.3.3 The principal reason for the development of S-RAN equipment was for mobile operators to control their costs through a period where traffic is migrating between technologies by making a single purchase. The model currently assumes that when the network is dominated by 4G equipment carrying 4G traffic, a cost premium remains associated with 2G equipment that has left the network. This is not consistent with the overall assumption of modelling a hypothetical efficient operator's long run costs.

A1.3.4 A similar problem carries over to the capex sheet. Here the traffic split is taken into account but with a significant proportion (20%) allocated as common costs. It is reasonable to assume that a proportion of the physical equipment costs are independent of the technology which is carrying the traffic. However, the current approach result in a situation where the S-RAN equipment cost is, in effect, being allocated to a technology where there is no traffic being carried over it.

A1.3.5 As with the opex, the assumed method of allocating cost to technology is based on an assumption regarding the relative cost of different single technology components. Again, this puts a price premium onto 4G, even where the sites are 4G only and long after the 2G and 3G traffic has declined away.

A1.3.6 BT therefore considers that in this aspect, the model is generating unrealistic results. As stated in BT's February 2014 comments, we remain of the view that the appropriate way to account for S-RAN equipment is to include its deployment in the Network module of the model. This is the place where all the information relevant to the deployment of S-RAN is available. Ofcom's current approach of modelling the impacts of S-RAN through changes to the Cost module inevitably leads to anomalies such as these arising.

A1.3.7 In the alternative, if Ofcom retains the current approach, BT considers that the cost of devices over their lifetime needs to be revisited. For example, an S-RAN unit could be deployed as a 2G replacement base station that has 4G capability. This unit will command a cost premium relative to a 2G or 4G only device due to its capacity and associated licence fees for running S-RAN features. Over time the unit will be increasingly devoted to 4G traffic with processor load diverted to 4G features and 2G eventually being withdrawn. At this point the cost of the unit would be expected to be similar or the same as a 4G only unit. It is not appropriate for a 4G cost premium to be applied in perpetuity. BT considers

[27] BT response "Mobile Call Termination Market Review 2015-2018: comments on draft model" 20 February 2014.

this approach is also consistent (albeit in a different context) with the principle established in previous Competition Commission determinations that the costs of newer and more efficient technologies should not in principle be greater than earlier technologies.[28]

[28] See paragraph 2.9.10 of the Competition Commission determination of 16 January 2009 in Cases 1083/3/3/07 and 1085/3/3/07 "Mobile phone wholesale voice termination charges".

A2. Annex: Deloitte report “Volume Forecasts in Ofcom MCT model”

This Annex is provided as a separate report.