Leased Lines Charge Control

Annexes

Consultation

Publication date: 5 July 2012

Closing Date for Responses: 30 August 2012

Contents

Annex 1

Responding to this consultation

How to respond

A1.1 Ofcom invites written views and comments on the issues raised in this document, to be made **by 5pm on 30 August 2012**.

A1.2 Ofcom strongly prefers to receive responses using the online web form at http://stakeholders.ofcom.org.uk/consultations/llcc-2012, as this helps us to process the responses quickly and efficiently. We would also be grateful if you could assist us by completing a response cover sheet (see Annex 3), to indicate whether or not there are confidentiality issues. This response coversheet is incorporated into the online web form questionnaire.

A1.3 For larger consultation responses - particularly those with supporting charts, tables or other data - please email Monika.Kochanowska@ofcom.org.uk attaching your response in Microsoft Word format, together with a consultation response coversheet.

A1.4 Responses may alternatively be posted or faxed to the address below, marked with the title of the consultation.

Monika Kochanowska-Tym
Floor 4
Competition Group
Riverside House
2A Southwark Bridge Road
London SE1 9HA

Fax: 020 7783 4109

A1.5 Note that we do not need a hard copy in addition to an electronic version. Ofcom will acknowledge receipt of responses if they are submitted using the online web form but not otherwise.

A1.6 It would be helpful if your response could include direct answers to the questions asked in this document, which are listed together at Annex 4. It would also help if you can explain why you hold your views and how Ofcom's proposals would impact on you.

Further information

A1.7 If you want to discuss the issues and questions raised in this consultation, or need advice on the appropriate form of response, please contact Monika Kochanowska on 020 7783 4192.

Confidentiality

A1.8 We believe it is important for everyone interested in an issue to see the views expressed by consultation respondents. We will therefore usually publish all responses on our website, www.ofcom.org.uk, ideally on receipt. If you think your

response should be kept confidential, can you please specify what part or whether all of your response should be kept confidential, and specify why. Please also place such parts in a separate annex.

A1.9 If someone asks us to keep part or all of a response confidential, we will treat this request seriously and will try to respect this. But sometimes we will need to publish all responses, including those that are marked as confidential, in order to meet legal obligations.

A1.10 Please also note that copyright and all other intellectual property in responses will be assumed to be licensed to Ofcom to use. Ofcom's approach on intellectual property rights is explained further on its website at http://www.ofcom.org.uk/about/accoun/disclaimer/

Next steps

A1.11 Following the end of the consultation period, Ofcom intends to publish a statement in the first quarter of 2013.

A1.12 Please note that you can register to receive free mail Updates alerting you to the publications of relevant Ofcom documents. For more details please see: http://www.ofcom.org.uk/static/subscribe/select_list.htm

Ofcom's consultation processes

A1.13 Ofcom seeks to ensure that responding to a consultation is easy as possible. For more information please see our consultation principles in Annex 2.

A1.14 If you have any comments or suggestions on how Ofcom conducts its consultations, please call our consultation helpdesk on 020 7981 3003 or e-mail us at consult@ofcom.org.uk . We would particularly welcome thoughts on how Ofcom could more effectively seek the views of those groups or individuals, such as small businesses or particular types of residential consumers, who are less likely to give their opinions through a formal consultation.

A1.15 If you would like to discuss these issues or Ofcom's consultation processes more generally you can alternatively contact Graham Howell, Secretary to the Corporation, who is Ofcom's consultation champion:

Graham Howell
Ofcom
Riverside House
2a Southwark Bridge Road
London SE1 9HA

Tel: 020 7981 3601

Email Graham.Howell@ofcom.org.uk

Annex 2

Ofcom's consultation principles

A2.1 Ofcom has published the following seven principles that it will follow for each public written consultation:

Before the consultation

A2.2 Where possible, we will hold informal talks with people and organisations before announcing a big consultation to find out whether we are thinking in the right direction. If we do not have enough time to do this, we will hold an open meeting to explain our proposals shortly after announcing the consultation.

During the consultation

A2.3 We will be clear about who we are consulting, why, on what questions and for how long.

A2.4 We will make the consultation document as short and simple as possible and will include a short summary. We will try to make it as easy as possible to give us a written response. If the consultation is complicated, we may provide a shortened Plain English Guide for smaller organisations or individuals who would otherwise not be able to spare the time to share their views.

A2.5 A person within Ofcom will be in charge of making sure we follow our own guidelines and reach out to the largest number of people and organisations interested in the outcome of our decisions. Ofcom's 'Consultation Champion' will also be the main person to contact with views on the way we run our consultations.

A2.6 If we are not able to follow one of these principles, we will explain why.

After the consultation

A2.7 We think it is important for everyone interested in an issue to see the views of others during a consultation. We would usually publish all the responses we have received on our website. In our statement, we will give reasons for our decisions and will give an account of how the views of those concerned helped shape those decisions.

Annex 3

Consultation response cover sheet

A3.1 In the interests of transparency and good regulatory practice, we will publish all consultation responses in full on our website, www.ofcom.org.uk.

A3.2 We have produced a coversheet for responses (see below) and would be very grateful if you could send one with your response (this is incorporated into the online web form if you respond in this way). This will speed up our processing of responses, and help to maintain confidentiality where appropriate.

A3.3 The quality of consultation can be enhanced by publishing responses before the consultation period closes. In particular, this can help those individuals and organisations with limited resources or familiarity with the issues to respond in a more informed way. Therefore Ofcom would encourage respondents to complete their coversheet in a way that allows Ofcom to publish their responses upon receipt, rather than waiting until the consultation period has ended.

A3.4 We strongly prefer to receive responses via the online web form which incorporates the coversheet. If you are responding via email, post or fax you can download an electronic copy of this coversheet in Word or RTF format from the 'Consultations' section of our website at www.ofcom.org.uk/consult/.

A3.5 Please put any parts of your response you consider should be kept confidential in a separate annex to your response and include your reasons why this part of your response should not be published. This can include information such as your personal background and experience. If you want your name, address, other contact details, or job title to remain confidential, please provide them in your cover sheet only, so that we don't have to edit your response.

Cover sheet for response to an Ofcom consultation

BASIC DETAILS

Consultation title:

To (Ofcom contact):

Name of respondent:

Representing (self or organisation/s):

Address (if not received by email):

CONFIDENTIALITY

Please tick below what part of your response you consider is confidential, giving your reasons why

Nothing ☐

Whole response ☐

Part of the response ☐

Name/contact details/job title ☐

Organisation ☐

If there is no separate annex, which parts?

If you want part of your response, your name or your organisation not to be published, can Ofcom still publish a reference to the contents of your response (including, for any confidential parts, a general summary that does not disclose the specific information or enable you to be identified)?

DECLARATION

I confirm that the correspondence supplied with this cover sheet is a formal consultation response that Ofcom can publish. However, in supplying this response, I understand that Ofcom may need to publish all responses, including those which are marked as confidential, in order to meet legal obligations. If I have sent my response by email, Ofcom can disregard any standard e-mail text about not disclosing email contents and attachments.

Ofcom seeks to publish responses on receipt. If your response is non-confidential (in whole or in part), and you would prefer us to publish your response only once the consultation has ended, please tick here. ☐

Name

Signed (if hard copy)

Annex 4

Consultation questions

Question 1: Do you agree with our proposal to use an RPI-X form of charge control? If not, please explain why and propose an alternative approach with supporting information.

Question 2: Do you agree with our proposal for the charge control to run for a maximum of three years from the date of implementation? If not, please explain why and propose an alternative approach with supporting information.

Question 3: Do you agree with our overall proposal for the design of the charge control? If not, please explain why and propose an alternative approach with supporting information.

Question 4: Do you agree with our proposals for TI, specifically: basket design; anchor pricing approach; base year adjustments; and forecasting assumptions? If not, please explain why and propose alternative approaches with supporting information.

Question 5: Do you agree with our proposal for Ethernet, specifically: basket design; modern equivalent asset approach; base year adjustments; and forecasting assumptions? If not, please explain why and propose alternative approaches with supporting information.

Question 6: Do you agree with our approach and proposals for controls for excess construction charges? If not, please explain why and propose an alternative approach with supporting information.

Question 7: Do you agree with our approach and proposals for charge controls for accommodation? If not, please explain why and propose an alternative approach with supporting information.

Question 8: Do you agree with our proposal for charge controls for AI services in the WECLA? If not, please explain why and propose an alternative approach with supporting information.

Question 9: Do you agree with our proposal for charge controls for retail analogue services? If not, please explain why and propose an alternative approach with supporting information.

Question 10: Do you agree with our proposals for the implementation of the new charge controls? If not, please explain why and propose alternative approaches with supporting information.

Question 11: Do you agree with our approach to cost forecast modelling? If not, please explain why and propose an alternative approach with supporting information.

Question 12: Do you agree with our assumptions of key inputs? If not, please explain why and propose an alternative approach with supporting information.

Question 13: Do you agree with our approach in relation to POH charges? If not, please explain why and propose an alternative approach with supporting information.

Question 14: Do you agree with our proposals for the treatment of cost of capital? If not, please explain why and propose an alternative approach with supporting information.

Annex 5

Ofcom's forecasting model

Introduction

A5.1 As explained in Section 4, we have developed a cost forecasting model (the 'LLCC model') in order to calculate a value of X for the main baskets in the charge control. For each basket, we propose that BT would be required to ensure that its charges for the services in question do not increase by more than RPI minus the value of X.

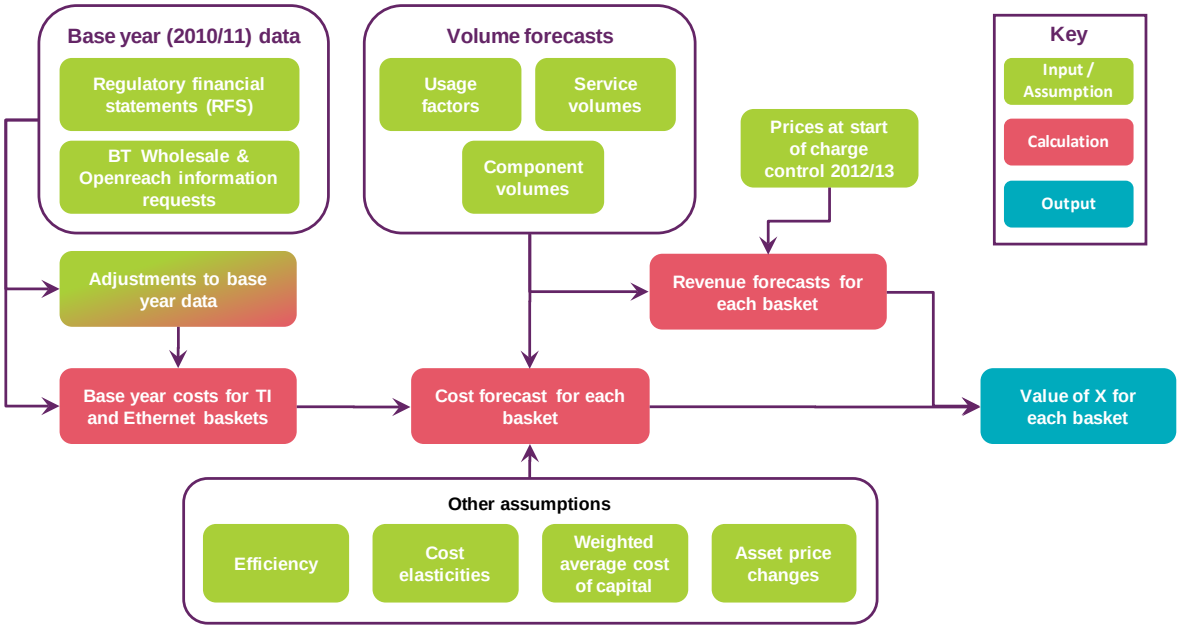
A5.2 This annex:

- provides an overview of the LLCC model;
- details our base case cost adjustments;
- shows our volume forecasts;
- explains how we have applied the MEA approach;
- outlines our cost forecast assumptions;
- explains our cost forecasting approach;
- explains how we have calculated the reallocation between the TI and Ethernet baskets; and
- shows our value of X and how we have arrived at the consultation range.

Overview of model structure

A5.3 The objective of the LLCC model is to estimate how the costs of providing the relevant services will change over the period of the proposed charge control. In so doing, we have structured the LLCC model as illustrated in Figure A5.1

Figure A5.1 The LLCC model structure



A5.4 In summary, the structure illustrated by Figure A5.1 above is that, firstly, we calculate the respective base year costs for the TI and Ethernet baskets. The base year cost data comes from BT's RFS, as well as data supplied by BT in response to the information requests. We have made adjustments to such data to reflect our proposed structure of the baskets, as well as to reflect forward looking efficient costs.

A5.5 Secondly, we have forecast the costs in the final year of the charge control. Total costs are forecast based on how different types of costs might vary with respect to the underlying volume changes, subject to assumptions such as efficiency, asset price changes and the WACC.

A5.6 Thirdly, we have determined what the revenues would be at the end of the charge control by multiplying service volumes by their respective prices. In effect, this is what the revenues would be in the absence of any price changes from current levels.

A5.7 Finally, we have calculated the value of X for the basket in question such that forecast total revenues within each basket are equal to forecast total costs in the final year of the charge control. The value of X is then calculated as follows:

A5.8 $X = (Costs_T / [Price_0 * Volumes_T])^{1/3} - 1$

Where:

$Costs_T$ = Forecast costs at the end of the charge control (2015/16)

$Price_0$ = Service prices at the start of the charge control (2012/13)

$Volumes_T$ = Service volumes at the end of the charge control.

A5.9 In the sections below, we further describe in detail how we determine the costs at the end of the charge control period.

We propose the following adjustments to BT's base year costs in 2010/11

A5.10 Our starting position for the base year costs are BT's RFS for 2010/11. The data supplied both by BT Wholesale and Openreach in response to our information requests have provided us with detailed disaggregation of costs that have been prepared on the same basis as those in the RFS. The 2010/11 RFS are the latest fully audited set of regulatory accounts that we had at our disposal for the purpose of carrying out the charge control modelling.

A5.11 BT has provided disaggregated financial data for 2010/11 on a component basis for the leased line services at the same level of aggregation as those reported in the RFS[1]. For example, costs for WES services are available for some bandwidths (10Mbit/s, 100Mbit/s and 1Gbit/s) but aggregated across others (2Mbit/s, 155Mbit/s and 622Mbit/s)[2].

A5.12 We propose adjusting the cost data to ensure that these are representative of the relevant level of costs for the respective baskets on a forward looking basis for setting this charge control. We also consider whether to make one-off adjustments to starting charges, which requires reliable cost data matched to revenues.

A5.13 We propose two main types of adjustments, described in detail in Table A5.1 below, namely:

- adjustments to reflect the composition of the basket; and
- adjustments to base year costs to reflect forward looking efficient costs for the purposes of forecasting costs to 2015/16.

Table A5.1: Types of adjustments made to base year costs

#	Question	Type of adjustment	Examples
1	Do BT's reported figures reflect the composition of our basket?	Include or exclude service data to reflect composition of the basket	Exclude SDSL, POH, capital employed associated with ECCs, protected paths, resilience and other ancillary services Geographic adjustment
2	Are any adjustments needed to provide a more	Amendments to base year	Update to BT's volumes

[1] Network components are the underlying pieces of infrastructure / activities that make up each service. Every service reported by BT uses one or more components. For example, PPC 64kbit/s - link uses the following components: PC rental 64kbit link, SG & A partial private circuits and SG & A private circuits. Network access provided by BT Wholesale for downstream services is based on components that are common to PPCs sold externally. BT's total network costs are disaggregated into these network components. Costs of a service is then dependent on the amount of costs attributed to these components, which are described in BT's Detailed Attribution Methodology document: http://www.btplc.com/Thegroup/RegulatoryandPublicaffairs/Financialstatements/2011/DetailedAttributionMethods2011.pdf

[2] See the RFS for more details of the services reported: p.42 to p.51 for PPC terminating segments, p.52 to p.55 for Ethernet services, and p.73 to p.74 for PPC trunk segments. http://www.btplc.com/Thegroup/RegulatoryandPublicaffairs/Financialstatements/2011/CurrentCostFinancialStatements2011.pdf

#	Question	Type of adjustment	Examples
	relevant view of BT's profitability for 2010/11?	data	Mismatch of revenues and costs such as: • transmission equipment costs • payment terms
3	Does our adjusted accounting view provide a suitable basis for price controls in terms of:		
a	reflecting one-off events or abnormal levels of cost or revenue?	Smoothing of costs & revenues i.e. adjusting to reflect expected levels of future costs or revenues	Normalisation of current cost holding gains/losses
b	how we expect BT to recover particular items of cost in future?	Implementing our cost recovery methodologies through adjustments to costs and revenues	Cost recovery profile for duct to be consistent with BT's RAV

TI basket

A5.14 In Table A5.2 below, we set out the different types of adjustments that we are proposing to make to the 2010/11 data for the TI basket, our reasoning and the data used for proposing each of these adjustments.

Table A5.2: Adjustments to reported 2010/11 costs, revenues & volumes for the traditional interface ('TI') basket

#	Description of adjustment	Mechanics / source data used
Non-core services		
1	Ancillary services and Points of Handover We propose to model only core services for determining the X to be applied to the TI basket. BT charges customers for other services used in the provision of the core TI services, known as 'ancillary services'. We do not model these services because it would require a significant number of assumptions detailing the specific nature of connections, migrations, cancellations and take up of additional service options. The table below shows that these account for around 6% of all TI services and therefore would only have a small impact on the value of X if there were included in the modelling analysis. For POH services we analyse these charges on a different basis.	We exclude POH services, ancillary services and resilient circuits from our modelling. Ancillary services data is not included in the RFS. POH revenues and costs are separately identified in the RFS and we exclude these from our modelling analysis for setting the overall basket cap.

#	Description of adjustment	Mechanics / source data used
2	Protected paths and separation & diversity costs BT's RFS separately identify the revenues and an estimate of the costs for protected path variants and separation and diversity circuits. We eliminate these from our modelling analysis since our X is based on the costs and revenues of the core TI services. Our forecasts assume that the volumes for the core TI basket services do not include protected path variant or separation and diversity circuit volumes.	BT's estimate of costs in the RFS did not include all resilience and separation costs, as some of the costs have been included within other services. BT subsequently provided an estimate of additional resilience and protected path costs that are included within other services in the RFS and we eliminated these additional costs against reported services. We excluded the impact on holding gains and other CCA adjustments as we model those separately.
Services out of scope of TI basket		
3	SDSL BT includes SDSL within the reporting for TI services. SDSL is a legacy product that BT Wholesale does not intend to support beyond spring 2014. We exclude SDSL from the basket.	We eliminated SDSL costs and revenues from our analysis based on the reporting in the RFS.
4	Assets constructed under 'Excess construction' BT includes the cost of providing ECCs within the base data for TI basket services. ECCs do not however fall within our proposed TI basket and we therefore eliminated an estimate of the cost of these services. BT also capitalises and depreciates all ECC costs. However, customers have to pay BT upfront when they incur ECCs. We therefore propose to remove an estimate of capital employed associated with ECCs from the MCE of other services to avoid double recovery.	BT estimates the costs of ECCs in its RFS. All ECC costs are capitalised and depreciated. The depreciation is removed from specific services and reported against ECCs in the RFS. We are unable to determine exact ECCs costs and against what services these have been capitalised as BT does not have the data where those costs are reported separately. We have eliminated the estimate of capital employed associated with ECCs against all low bandwidth TI services MCE in proportion to reported MCE of these services. We have estimated ECCs costs within MCE by calculating the ratio of ECCs depreciation to total depreciation in the low bandwidth market, and then applying the same proportion to total relevant MCE.

#	Description of adjustment	Mechanics / source data used
5	Geographic disaggregation We propose in the BCMR Consultation that no operator has SMP in medium and high bandwidth TI services in the WECLA[3]. We therefore propose to exclude the costs and revenues associated with the WECLA from our modelling.	BT has analysed the costs for TI services that vary by geography and it has provided calculations of the extent of the difference between the WECLA and the rest of the UK. BT Wholesale's methodology[4] can be summarised as follows: First, BT Wholesale categorised the cost categories which constituted these service into access related costs, equipment related costs and other costs. It then calculated how costs of access and equipment related costs varied by geography. Based on these estimates, it applied the unit cost differentials to the overall share of these costs categories on a per circuit basis. BT Wholesale's analysis found that aggregate unit cost differentials for main link are as follows: Links: 34/45Mbit/s — WECLA [✂] — Rest of UK [✂] Links: 140/155Mbit/s — WECLA [✂] — Rest of UK [✂] It found that aggregate unit cost differentials for local ends are as follows: Local ends: 34/45Mbit/s — WECLA [✂] — Rest of UK [✂] Local ends: 140/155Mbit/s — WECLA [✂] — Rest of UK [✂] We have also adjusted the total TI trunk volumes and costs to include only regional trunk, consistent with our proposals in the BCMR Consultation[5] . Trunk charges are applied on a per kilometre basis, and we do not believe that there should be differences in unit costs between regional and national trunk. We have estimated the proportion of regional and national trunk as follows: Trunk volumes at all bandwidths — Regional 41 % — National 59% Trunk costs at all bandwidths — 41% — 59% Unit cost differential — 100% — 100% We have adjusted the nationally averaged cost data based on this geographic analysis when modelling TI services, as we consider that this adjusted data provides a more accurate reflection of the costs in the charge controlled area than nationally averaged data. Our analysis suggests that, in 2010/11, the costs for medium and high bandwidth circuits are between 10 to 20% higher in the charge controlled area compared to the non-charge controlled areas.

#	Description of adjustment	Mechanics / source data used
	Data updates	
6	**Volume update**	
	BT updated its 2010/11 volume data for main links and local ends, based on data from BT's costing system[6]. BT identified errors in its estimates of volumes following a detailed review of the system as part of the work on geographic costing that we requested.	We have used the new volume data provided by BT to update our model. The effect is a 3% reduction in base year revenues.
	Adjustments to reflect forward looking efficient costs	
7	**Current cost normalisation**	
	BT prepares its RFS using CCA principles. These costs reflect the actual level of asset prices changes experienced and the impact of any changes to the methodologies used to value assets. Therefore, one period's CCA adjustments are unlikely to provide a robust forecast for future years. We have therefore substituted BT's numbers with our own estimate of future asset price changes and eliminate the impact of any one off methodology changes.	We have adjusted asset price change forecast assumptions in our model, substituting the values provided by BT for 'holding (gain)/loss' and 'other CCA adjustments' with our own forecasts. We have calculated our forecast holding gain by multiplying asset values by the geometric mean of the past five years' asset price change figures as supplied by BT excluding one off changes. We assume that forecast price changes for duct will be equal to RPI. This is consistent with our approach to RAV. We explain the source of our asset inflation assumptions in Section 5.
8	**21CN**	
	Our proposed TI basket services include an element of the cost of BT's investment in its 21CN network. We consider that these costs should be recovered against services delivered over the 21CN network, and not against current services which do not use this network. We have therefore eliminated an estimate of 21CN costs reflected in TI services. BT's use of the term '21CN' in the RFS includes its next generation backhaul network as well as its core.	In 2010/11, BT identified components which it attributed to certain services in the TI basket. Components, in the same way as BT's plant groups, comprise not just direct costs such as for equipment but also indirect costs such as accommodation & security as well as corporate costs. *Avoidable versus unavoidable element* We asked BT to provide us with an analysis for 2010/11 of the 21CN costs which identified which costs were truly specific to 21CN (e.g. equipment and software) including overheads that would not have been included in the service costs had the MCE of 21CN components been excluded from the services. Based on this analysis, we have eliminated costs and MCE specific to 21CN network.

[3] See paragraphs 7.122 and 7.161 of BCMR Consultation.
[4] BT Wholesale response to S135 Notice of 21 May 2012.
[5] See paragraphs 7.434 to 7.486 of the BCMR Consultation.
[6] For circuits above 2Mbit/s BT's Core Transmission Costing System (CTCS) is the central system for determining how circuits are provisioned within the network.

#	Description of adjustment	Mechanics / source data used
9	Payment terms	
	Part of the relevant capital employed includes the cost to BT of financing the payment terms it offers. BT reflects this cost as notional debtors. We have calculated its value using the number of days between when BT (on average) provides the service and when it expects to be paid. We have then multiplied this number of days over 365 days by its annual revenues to arrive at the value to include in MCE. BT's value for notional debtors reflects 33 days of revenues across all services, which differs from the terms actually offered on individual services. We have therefore adjusted notional debtors to reflect BT's actual payment terms for each service.	We have substituted the internal and external debtor figures, which reflect 33/365'ths of internal and external revenues, with a revised calculation based on 16/365 days and 47/365 days for rental and connection services respectively. *Rentals* 16 days represents the average interval for services billed monthly in advance. This includes a day for bill preparation. *Connections* 47 days represents the average interval between a new connection and when payment falls due. BT invoices connections on a monthly billing cycle, rather than billing for the service the day after connection. This period includes two days for bill preparation.
10	Regulatory asset value (RAV)	
	We propose to adjust BT's current cost depreciation and asset values for access duct. This is to ensure full and fair cost recovery over the life of these assets across all the services that use these assets.	We have attributed the total value of the RAV adjustment for access duct in 2010/11 across all TI services. Because copper is nearing the end of its useful life, the adjustment is immaterial. We have calculated the adjustment for duct by taking the difference between CCA and RAV valuations and multiplying it by the percentage of duct that is used by TI services. The relevant percentage was identified by BT as approximately 10%. We have then applied the adjustment to MCE and depreciation of access duct across all TI services. The adjustment is based on the RAV value of duct calculated in accordance with the methodology described in the February 2012 WLR LLU CC[7].

A5.15 In Table A5.3 below (the same table as included in Section 5), we show the impact of these proposed adjustments on the reported 2010/11 data. We note, in particular, that:

- for the adjustments made in order to reflect forward-looking efficient costs, the figures shown in Table A5.3 below reflect the impact to the basket only, rather than to the TI market as a whole; and
- these adjustments are made in the base year and rolled forward using the same assumptions as applied to the base year costs. As such, the ROCE figures

[7] http://stakeholders.ofcom.org.uk/consultations/llu-wlr-further-consultation/statement

shown are for illustrative purposes only and do not reflect actual profitability achieved in 2010/11.

Table A5.3: Impact of adjustments on the TI basket[8]

Adjustment	Revenues (£m)	Operating costs (£m)	Capital costs[9] (£m)	Mean capital employed (£m)	ROCE (%)
RFS All TISBO and TI trunk markets	**898**	**342**	**344**	**1,497**	**14.2%**
Points of handover	-8	-7	-9	-28	
TISBO and TI trunk	**890**	**335**	**335**	**1,469**	**15.0%**
Ancillary services Resilience circuits, separation & diversity, ECCs and third party infrastructure costs	-54	-4	-43	-18	
Additional protected paths costs	-	-2	-1	-8	
Additional separation & diversity costs	-	-1	-1	-7	
Exclusion of ECC assets	-	-	-	-39	
TISBO and TI trunk core services	**836**	**328**	**290**	**1,397**	**15.6%**
SDSL	-11	-2	-1	-5	
TISBO and TI trunk core services excl. SDSL	**825**	**326**	**289**	**1,392**	**15.1%**
Volume update Updated estimate of TI main link and local ends following audit of CTCS database	-25	-	-	-	
TISBO and TI trunk core services volume update	**800**	**326**	**289**	**1,392**	**13.3%**
Geographic disaggregation Exclude services delivered within the WECLA	-47	-9	-18	-87	
TISBO and TI trunk core services outside the WECLA	**753**	**317**	**271**	**1,305**	**12.6%**
Ofcom cost adjustments Current cost normalisation		-	-61	-	
Exclusion of 21CN costs		-4	-11	-42	
Payment terms		-	-	-148	
Regulatory asset value (RAV) adjustment to duct assets		-	-14	-179	
Total TI basket in 2010/11	**753**	**314**	**185**	**937**	**27.2%**

Ethernet basket

A5.16 In Table A5.4 below, we set out the different types of adjustments we are proposing to make to 2010/11 data for the Ethernet basket, our reasoning and the data used for each of these adjustments.

[8] Not all columns may total correctly as numbers have been rounded.
[9] Capital costs includes depreciation and holding losses (gains).

Table A5.4: Adjustments to reported 2010/11 costs and revenues for the Ethernet basket

#	Adjustment	Mechanics / source data used
Services in and out of scope of the basket		
1	Non-core ancillary services	
	Similar to the approach we propose for the TI services, we propose to only model core services. There would be significant amount of additional data and assumptions required in order to forecast the volume of ancillary services. The table below shows that they make up a small proportion of the Ethernet market.	We have excluded revenues and costs associated with ancillary services from base year costs.
2	Services not reported in RFS	
	We propose to include Ethernet services that are part of the main Ethernet services we model (internal BES, ONBS and EBD up to 1Gbit/s and their associated main link distances and above 1Gbit/s Ethernet services and their associated main link distances).	BT does not report volumes, revenues and costs of these services in its RFS and this information was provided by BT in a separate submission. We include this data in our modelling.
3	Other services	
	We propose to exclude Cablelink, Broadcast Access, CCTV access, Street Access to reflect our proposals in the BCMR Consultation[10].	We have excluded costs, revenues and volumes of these services from base year data.
4	ECCs	
	BT includes the cost of providing ECCs services within the base data for Ethernet basket services. ECCs do not, however, fall within the Ethernet basket and we have therefore eliminated an estimate of the cost of these services.	BT estimates the costs of ECCs in its RFS. All ECCs costs are capitalised and depreciated. The depreciation is removed from specific services and reported against ECCs in the RFS.
	BT also capitalises and depreciates all ECCs costs. However, these costs do not need to be recovered as part of ongoing revenues to ensure cost recovery, because customers have to pay BT upfront when they incur ECCs. We therefore propose to remove the capital employed associated with ECCs from MCE of other services to avoid double recovery.	We are unable to determine exact ECC costs and against what services these have been capitalised as BT does not have this breakdown of data. We have eliminated the estimate of the capital employed associated with ECC costs against MCE of all Ethernet services in proportion to the reported MCE of these services. We estimated ECC MCE by calculating the ratio of ECC depreciation to total depreciation and then applying the same proportion to the total relevant MCE.

[10] See paragraph 4.332 of the BCMR Consultation.

#	Adjustment	Mechanics / source data used
5	Geographic disaggregation	
	We propose in the BCMR Consultation that the competitive conditions in the market for low bandwidth Ethernet services in the WECLA are different to those outside the WECLA and accordingly we propose to regulate these areas differently[11]. We propose to exclude the costs and revenues associated with the WECLA from our modelling. If costs differ between the charge controlled and non-charge controlled areas, then in order to accurately model the costs in the charge controlled area, we should use geographically disaggregated costs.	Openreach has provided data on the proportion of Ethernet circuits in the WECLA, and the cost differential with respect to the rest of the UK (excluding Hull). From the data submitted, there is insufficient data for us to assess Openreach's methodology. We have used the estimate of the proportion of WECLA circuits from the figures we published in the BCMR Consultation, and we have assumed that the cost differential for Ethernet is the same as for high bandwidth TI circuits.
	Adjustments to reflect forward looking efficient costs	
6	Current cost normalisation	
	As already noted, BT prepares its statements using CCA principles. These costs reflect the actual level of asset price changes experienced and the impact of any changes to the methodologies used to value assets. Therefore, one period's CCA adjustments are unlikely to provide a robust forecast for future years. We have therefore substituted our own estimate of future asset price changes and eliminate the impact of any methodology changes.	We have adjusted asset price change forecast assumptions in our model, substituting the values provided by BT for 'holding (gain)/loss' and 'other CCA adjustments' with our own forecasts. We have calculated our forecast holding gain by multiplying asset values by the geometric mean of the past five years' asset price change figures as supplied by BT excluding one-off changes. We explain the source of our asset inflation assumptions under 'Asset price changes' in Section 5.
7	Transmission equipment costs	
	Up to 2010/11, BT recovered the cost of the transmission equipment deployed at either end of an Ethernet circuit and which are wholly dedicated to that service, through the local end connection charges. BT also capitalised and depreciated this equipment over its useful economic life. In the LLCC 2009 we made an adjustment to match costs and revenues by eliminating MCE and depreciation of the assets and replacing them with a measure of fully expensed cost of the equipment on connection. In 2010/11, BT changed the accounting policy to recover the cost of transmission equipment through rentals. We therefore need to remove the costs associated with transmission equipment assets capitalised before 2010/11.	BT provided a breakdown of transmission equipment capitalised before 2010/11 and in the year. We have eliminated HCA and MCE related to transmission equipment capitalised before 2010/11 from our cost base.

[11] See paragraph 11.168 of the BCMR Consultation.

#	Adjustment	Mechanics / source data used
8	Payment terms	
	Part of the relevant capital employed includes the cost to BT of financing the payment terms it offers. BT reflects this cost as notional debtors. We have calculated its value using the number of days between when BT (on average) provides the service and when it expects to be paid. We have then multiplied this number of days over 365 days by its annual revenues to arrive at the value to include in MCE. BT's value for notional debtors reflects 33 days of revenues across all services, which differs from the terms actually offered on individual services. We have therefore adjusted notional debtors to reflect BT's actual payment terms for each service.	We have substituted the internal and external debtor figures, which reflect 33/365'ths of internal and external revenues, with a revised calculation based on 16/365 days and 46/365 days for rental and connection services respectively. *Rentals* 16 days represents the average interval for services billed monthly in advance. This includes a day for bill preparation. *Connections* 47 days represents the average interval between a new connection and when payment falls due. BT invoices connections on a monthly billing cycle, rather than billing for the service the day after connection. This period includes two days for bill preparation.
9	Regulatory asset value (RAV)	
	We propose to adjust BT's current cost depreciation and asset values for access duct. This is to ensure full and fair cost recovery over the life of these assets across all the services that use these assets.	We have attributed the total value of the RAV adjustment for 2010/11 across all relevant BT services. The adjustment for copper is immaterial as copper is almost fully depreciated. We have calculated the adjustment for duct by taking the difference between CCA and RAV valuations and multiplying it by the percentage of duct that is used by AI services. The relevant percentage was identified by BT as approximately 7%. We have then applied the adjustment to MCE and depreciation of access duct across all Ethernet services. The adjustment is based on the RAV value of duct calculated in accordance with the methodology described in the February 2012 WLR LLU CC Statement[12].

A5.17 As with the TI basket, Table A5.5 below (also set out in Section 6) shows the impact of these proposed adjustments on the base year costs and revenues for the Ethernet basket.

[12] http://stakeholders.ofcom.org.uk/consultations/llu-wlr-further-consultation/statement

Table A5.5: Impact of adjustments on the Ethernet basket[13]

Adjustment	Revenues (£m)	Operating costs (£m)	Capital costs[14] (£m)	Mean capital employed (£m)	ROCE (%)
RFS All Ethernet market (i.e. Ethernet services up to 1Gbit/s)	**554**	**193**	**303**	**1,301**	**4.5%**
All services above 1Gbit/s	[✂]	[✂]	[✂]	[✂]	
Internal BES, EBP, ONBS services	[✂]	[✂]	[✂]	[✂]	
Out of scope services Cablelink, Street Access, CCTV Access, Broadcast Access, WDM services	[✂]	[✂]	[✂]	[✂]	
Ancillary services, including ECCs and TRCs	-	-	-4	-	
Exclusion of ECC assets	-32	-	-	-25	
Ethernet basket	**584**	**207**	**325**	**1,361**	**3.8%**
Geographic disaggregation Exclude services delivered within the WECLA	-49	-18	-24	-93	
Ethernet services outside the WECLA	**535**	**189**	302	**1,268**	**3.5%**
Ofcom cost adjustments Current cost normalisation			-86	-	
Exclusion of transmission equipment			-30	-67	
Payment terms			-	-21	
Regulatory asset value (RAV) adjustment to duct assets			-11	-145	
Total Ethernet basket in 2010/11	**535**	**189**	**174**	**1,035**	**16.7%**

We propose to use Ofcom's volume forecasts

A5.18 Service volume forecasts are a key determinant of the values of X for the TI and Ethernet baskets. Revenues in the final year of the charge control are calculated as the current prevailing service price multiplied by their respective final year volume forecasts.

A5.19 The volume forecasts for the services in the TI and Ethernet baskets are used to derive the total capital and operating costs that BT will need to recover by the end of the proposed charge control period. The values of X are sensitive to these forecasts due to the interaction between volumes and the asset volume elasticities and cost volume elasticities, which reflect economies of scale.

A5.20 We obtained detailed forecasts from both BT Wholesale and Openreach for the TI and Ethernet services respectively[15]. These forecasts are compiled internally by BT as part of its Medium Term Plan which it uses for business planning purposes. We

[13] Not all columns may total correctly as numbers have been rounded.
[14] Capital costs includes depreciation and holding losses (gains).
[15] BT Wholesale response to S135 Notice of 21 May 2012. Openreach response to S135 Notice of 25 May 2012.

have also taken into account volumes that were submitted for the BCMR Consultation.

A5.21 We have also obtained forecasts from a number of OCPs and commissioned an independent industry analyst to provide additional input into our forecasts. We have found that the trends shown in the forecasts are broadly consistent across the different sources and appear to be reasonable. Furthermore, the pattern of growth in Ethernet is consistent with the decline in TI volumes, as discussed in Section 5. We therefore propose to take into account all of the volume forecasts received to arrive at our base case for our cost modelling, conducting sensitivity testing where appropriate.

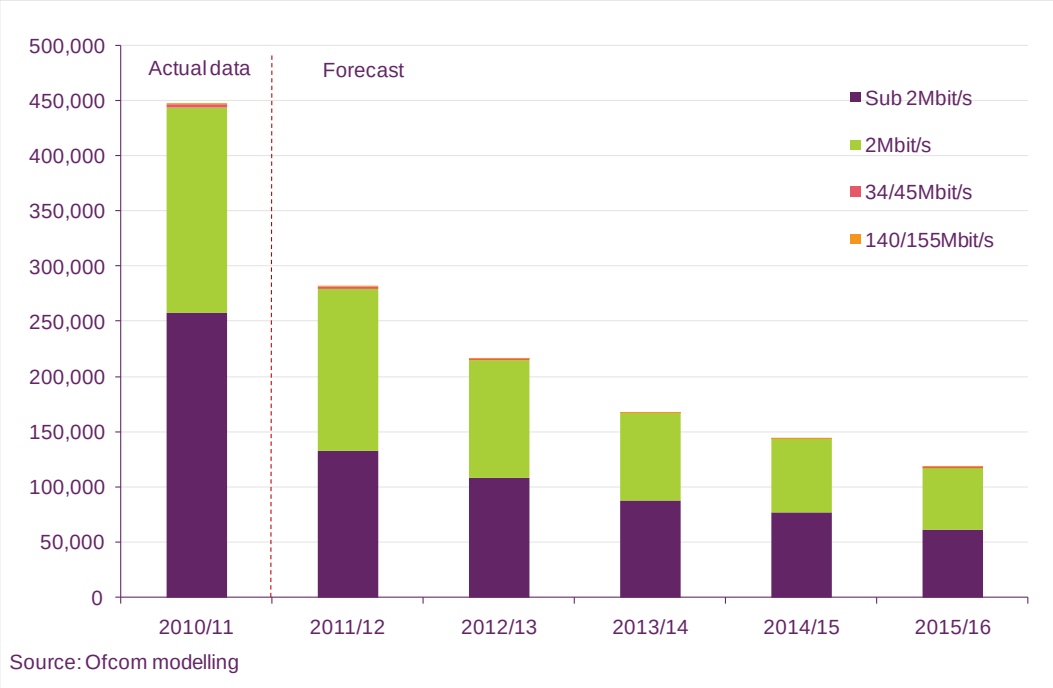
A5.22 Below, we set out our base case forecasts for TI and Ethernet services, and draw comparisons between the various sources to check for consistency. We also present what these forecasts mean in terms of total network capacity delivered.

Volume forecasts for TI services

We predict an overall decline in the demand for TI terminating and trunk segments

A5.23 In proposing this charge control, we have had to take into account an anticipated decline in the volume of TI services. By the end of this charge control, we expect the total number of TI circuits to decline by over 70% compared to 2010/11. There is a similar decline predicted in total capacity delivered through TI circuits at around 25% reduction per annum.

Figure A5.2 Ofcom forecasts of TI services to 2015/16 (number of circuits)



Source: Ofcom modelling

A5.24 Figure A5.2 shows that sub 2Mbit/s and 2Mbit/s circuits currently make up the vast majority of all TI circuits, and this is forecast to continue as the higher speed TI services (34/45Mbit/s and 140/155Mbit/s) and the mobile backhaul services migrate to Ethernet-based services.

A5.25 The main driver of the declining volumes in the TI market is the increasing demand for higher bandwidth services which, in general, can be delivered more efficiently using Ethernet services or potentially via high speed broadband services (for example, Next Generation Access ('NGA'), Ethernet and VPNs)[16]. As a consequence, many (but not all) customers are expected to migrate from TI to higher bandwidth services delivered using Ethernet and other technologies, with the Ethernet forecasts supporting this view of growth in high bandwidth services.

A5.26 It is likely a residual customer base will remain on TI services over the charge control period due to the very exacting requirements of some customers, such as the need for synchronisation which cannot currently be replicated using Ethernet services[17]. Some of the obstacles preventing migration from TI services are likely to reduce when Openreach introduces its synchronous Ethernet service[18].

A5.27 BT intends to close the Digital Private Circuit Network ('DPCN') used to carry low bandwidth (sub 2Mbit/s) PPCs by 2018 and has stated that its service level guarantee may reduce to 'best efforts' due to the very limited availability of replacement equipment[19]. This platform has been extended from a previous closure date of 2014.

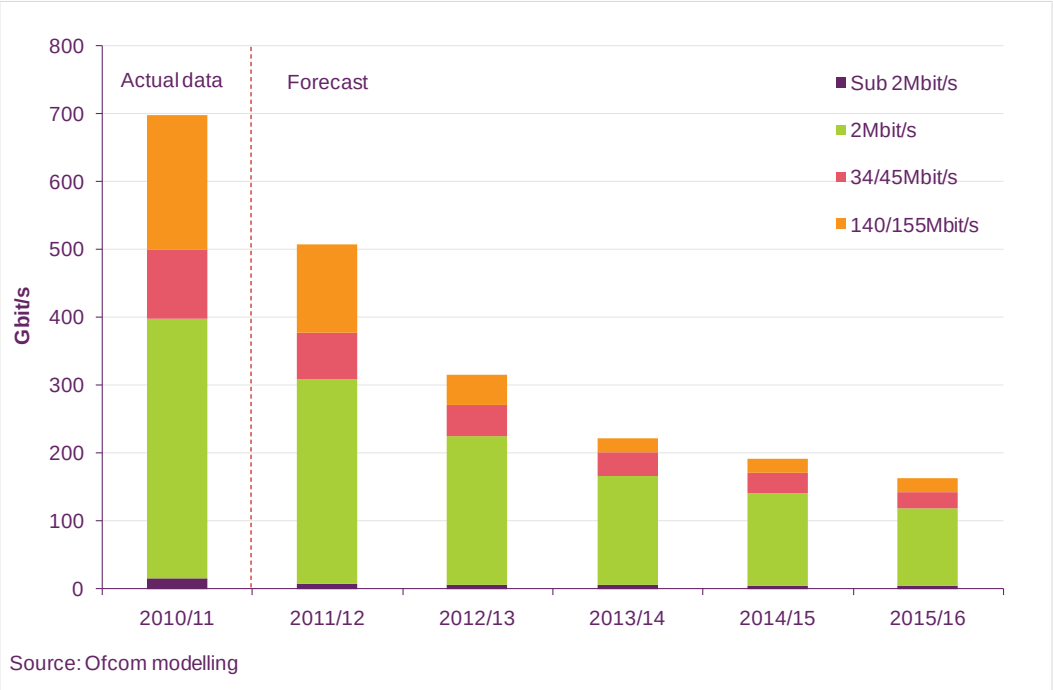
A5.28 We expect an acceleration in the decline of all local ends from 2010/11 onwards, reaching a level in 2015/16 which is between 8% and 31% of current levels, depending on bandwidth. By 2015/16, the higher bandwidth TI services are expected to decline by a greater proportion than the low bandwidth TI services. This is likely to be as a result of the similar bandwidth services available on Ethernet providing a more straightforward migration than for low bandwidth TI services for customers who are no longer reliant on the specific characteristics of TI.

A5.29 We have used our volume forecasts to derive a view of the capacity delivered over TI services. By multiplying the circuit volumes by the relevant bandwidths, we have forecasted the capacity delivered over the TI network until 2015/16. As shown in Figure A5.3 below, our forecasts predict that capacity will decline rapidly from 2010/11 to 2013/14 but is expected to decrease at a slower rate from 2013/14 onwards.

A5.30 In terms of circuits, over 80% of capacity is currently delivered by 2Mbit/s and 140/155Mbit/s circuits, and we expect this to remain relatively unchanged until the end of the charge control.

[16] BT Wholesale response to S135 Notice of 21 May 2012.
[17] Digital leased lines services are based on PDH and SDH technology, where the transmission of data is time-division multiplexed ('TDM'). As a result, the transmission characteristic can be predicted with a very high degree of accuracy.
[18] See for example R1900 E1P10 deployment on SOR 8167 on EAD Synchronous Ethernet which provides "Synchronous timing to the EAD product, mitigating the need for an 'out of band' timing source". https://www.openreach.co.uk/orpg/home/updates/eipcommunications/eipcommunications.do
[19] See, for example BT Wholesale briefing https://www.btwholesale.com/pages/downloads/21_Century_Network_Community/21CN_quarterly_webcall_%20220110.ppt.

Figure A5.3: Ofcom's forecast of TI services capacity



Source: Ofcom modelling

TI volume forecasts from different sources forecast a similar rate of decline

A5.31 Our base case forecasts show that TI volumes from 2010/11 onwards are expected to decline at a faster rate at the beginning of our forecast period than towards the end. We have derived our forecasts from those of three operators. The trend forecast of these operators is shown in Figure A5.4 and Figure A5.5. We note that these comparisons do not take into account changes in market share, operators' strategies or general trends. Nonetheless, the trends demonstrate a broadly consistent view of the market.

Figure A5.4: Comparison of TI volume forecasts, up to and including 2Mbit/s

[✂]

A5.32 Figure A5.4 above shows that the forecasts demonstrate very similar declining trends for the 2Mbit/s services. The 2Mbit/s services are particularly important as these currently make up a considerable proportion of TI volumes and all forecasts are consistent for those circuits.

Figure A5.5: Comparison of volume forecasts, above 2Mbit/s

[✂]

A5.33 Figure A5.5 compares the forecasts for the above 2Mbit/s services. CP1 and CP2 forecast similar rates of decline for the 34/45Mbit/s services. CP1 forecasts a more moderate decline in 140/155Mbit/s volumes than CP2, but we note that these make up a relatively small proportion of TI services. CP3 expects stronger decline in the above 2Mbit/s services and does not distinguish between 34/45Mbit/s and 140/155Mbit/s services. We note that CP3's data has been interpolated to ensure comparability between the other two data sets.

Conclusion on TI forecasts

A5.34 Our base case forecast of significant decline in TI volumes beyond 2010/11 is consistent with the volume forecasts provided to us by BT Wholesale and other CPs. We therefore consider that our base case forecasts provide a reasonable basis for our forward looking analysis in relation to TI services.

Volume forecasts for Ethernet services

A5.35 As with TI forecasts, we set out below our base case forecasts for Ethernet services. As an additional cross-check, we compare the trends in capacity derived from our base case forecasts for Ethernet services and TI services. The decline in TI capacity is consistent with the growth in Ethernet capacity; although we note that the volume growth from Ethernet services more than compensates the decline in TI capacity, in line with our expectation of overall capacity growth.

A5.36 We also present below the trends in rental volumes for two bandwidth categories (up to and including 1Gbit/s and above 1Gbit/s). In addition, we derive a view of the trend in capacity delivered using Ethernet services from the volume forecasts.

A5.37 During the charge control period (2012/13 to 2015/16), we expect to see significant migration from the legacy Ethernet services (WES and BES) to the newer equivalents (EAD and EBD). We have presented the specific volume trends for WES, BES, EAD and EBD services below.

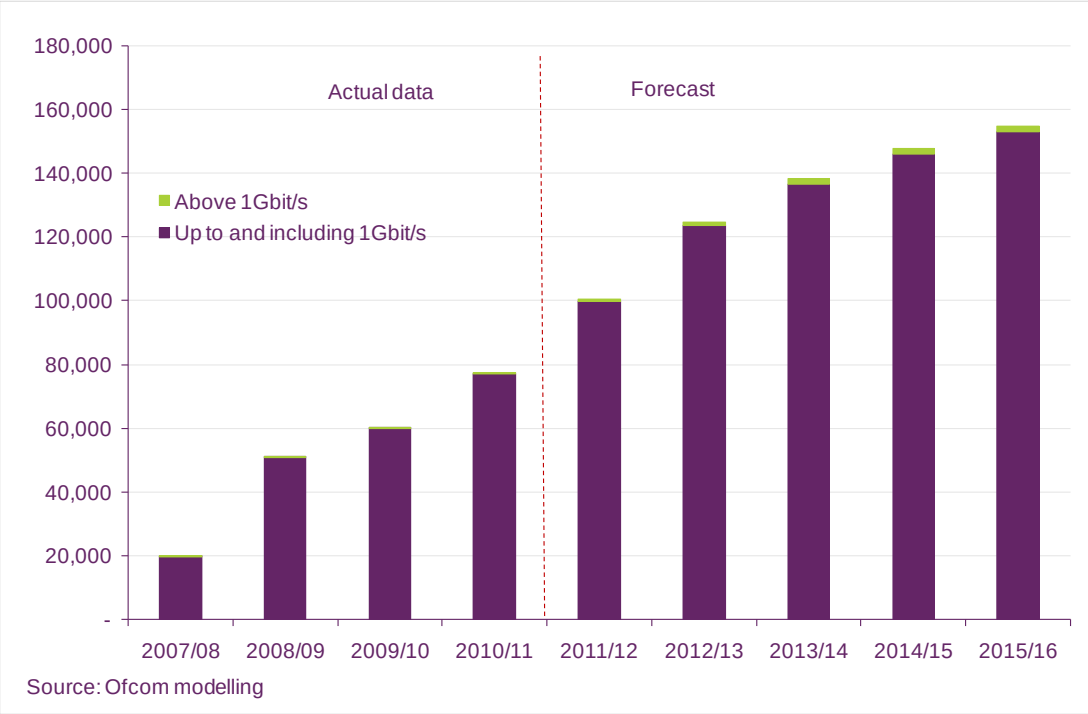
We expect significant growth in demand for high bandwidth Ethernet services

A5.38 In our base case forecast of Ethernet service volumes, we expect significant growth in demand for higher bandwidth Ethernet services. We consider that the overall trend in demand over the next few years is likely to be driven by the following factors.

- Increasing demand for broadband and greater capacity required by end-user applications is driving the backhaul bandwidth requirements of LLU operators and broadband providers.
- The need to transmit increasingly large amounts of data quickly is driving the need for greater bandwidth. As a result, the bandwidth profile of Ethernet services is likely to change over time, with a trend towards higher capacity circuits.
- The deployment of NGA and new services delivered over 4G mobile networks will further increase the requirement for backhaul capacity.
- Migration from SDH circuits to Ethernet is likely to drive further significant growth in the demand for Ethernet services.

A5.39 Our forecast of total Ethernet circuit volumes is summarised in Figure A5.6 below. It shows that there has been significant growth over the period from 2007/08 to 2010/11, and we expect this trend to continue to 2015/16. Of the historic growth in overall circuits, the most pronounced came from up to and including 1Gbit/s circuits, while from 2011/12 onwards, above 1Gbit/s circuits are forecast to grow at a faster rate than lower bandwidth Ethernet circuits (albeit from a lower base).

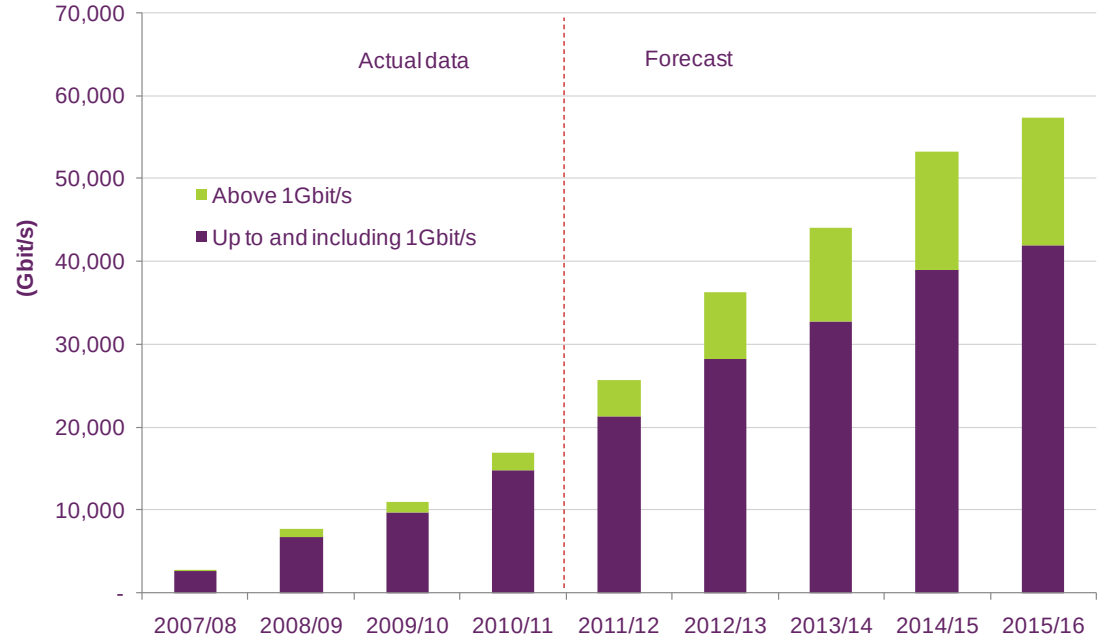
Figure A5.6: Ofcom historic and forecast volumes for Ethernet services (number of circuits)



A5.40 This historic upwards trend in the demand for Ethernet services is expected to continue over the period of our analysis. Rental volumes are likely to be driven by the increasing demand for higher bandwidth services and the migration of customers from the lower bandwidth TI services in decline. In addition, the transition from legacy WES and BES services to the newer EAD and EBD services may provide a suitable opportunity for customers to upgrade to a higher bandwidth service.

A5.41 With the increase in demand, we also expect to see a significant increase in the capacity delivered over BT's network, as shown below. We have taken our forecasts for individual service volumes and multiplied the rental volumes by the corresponding bandwidth to analyse the trend of capacity provided by Ethernet services. Figure A5.7 below demonstrates that capacity has grown significantly and that we forecast it to continue.

Figure A5.7: Capacity delivered through Ethernet services



Source: Ofcom modelling

Ethernet volume forecasts forecast a similar rate of increase

A5.42 Our base case volume forecasts show significant volume growth in the market for Ethernet services. Our forecasts are derived from the forecasts obtained from three providers ('CP1', CP2' and 'CP3') and an industry analyst Ovum ('Analyst'). These forecasts all show a consistent pattern of market trends. Figure A5.8 below compares the forecasts of these providers for individual circuit types.

Figure A5.8: Comparison of Ethernet circuit forecasts, up to 1Gbit/s

[✂]

A5.43 By bandwidth, there is a degree of consistency between the trends forecast by CP1 and the Analyst. Although CP1 forecasts a higher rate of growth in 10Mbit/s initially, both forecasts converge to similar rates of growth from 2012/13 onwards. CP3's forecast for 2012/13 is also consistent with the 10Mbit/s forecasts from the CP1 and the Analyst. CP2 forecasts a gradual decline in the 10Mbit/s services from 2011/12 onwards, which is different to the other three sources. For 100Mbit/s services, we note that CP2's expects a significantly higher growth rate than the other sources.

A5.44 For the 1Gbit/s and above services, we note that CP2's forecasts show a similar trend to that of the Analyst's. In comparison, CP1 does not expect a significant growth in the 1Gbit/s services. Instead it expects a sharp increase initially in the above 1Gbit/s services, which then tapers off after 2013/14.

A5.45 In order for us to compare the impact of the growth rates across the different sources, we calculate the total capacity delivered using Ethernet services. As Figure A5.10 shows the three forecasts predict a significant increase in capacity, and that, despite the differences in the growth rates of the underlying services by

bandwidth, all three predict similar rate of capacity growth. The growth rates shown are also consistent with the historic growth rates seen between 2007/08 and 2010/11.

Figure A5.9: Comparison of capacity forecasts from CP1, CP2 and Analyst

[✂]

Conclusion on Ethernet forecasts

A5.46 The trend in our base case forecast of significant growth in Ethernet volumes beyond 2010/11 is consistent with the volume forecasts provided to us by Openreach, other CPs and an independent industry analyst. We therefore consider that our base case forecasts provide a reasonable basis for our forward looking analysis in relation to Ethernet services.

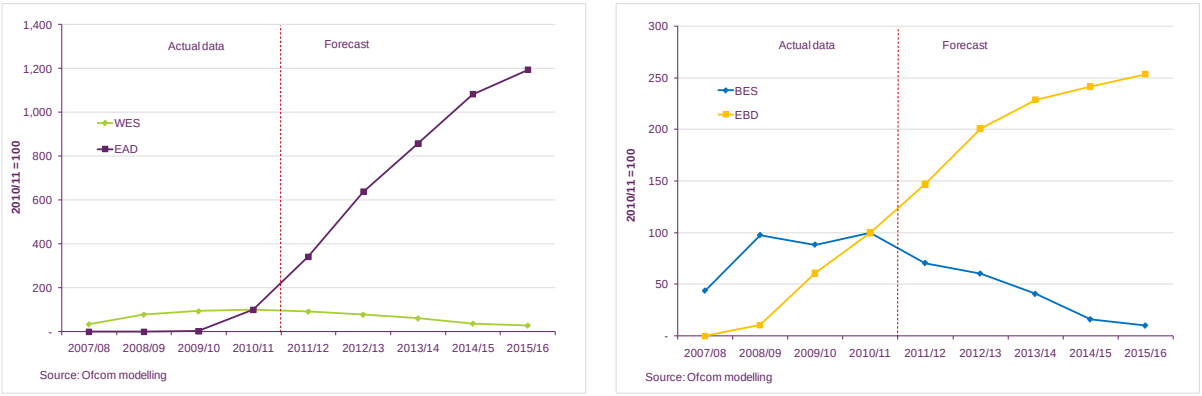
Modern Equivalent Asset ('MEA') approach

A5.47 The business connectivity services offered by BT are in a period of change. Volumes of services delivered using traditional interface are declining, whilst Ethernet services, which are capable of delivering higher bandwidths, are on the increase. In addition, we expect to see a transition from the legacy to newer Ethernet services used to provide the same functionality of current services.

A5.48 As discussed in Section 6, we propose to adopt a MEA approach for the purposes of modelling the costs of the legacy WES and BES services. We intend to model these services using the costs of what we consider to be the modern equivalent. To this end, Openreach has supplied us with a mapping of the legacy WES and BES services over to the nearest equivalent EAD or EBD service. We note that this mapping is independent of actual decisions that customers may make when transitioning from legacy to new services and whether they take the opportunity to upgrade their bandwidth at the same time.

A5.49 Figure A5.10 below shows the forecast decline of WES and BES, and the growth of EAD and EBD from 2010/11 through to 2015/16.

Figure A5.10: Ofcom volume forecast for WES and BES migrations (number of circuits)



A5.50 The forecasts show a significant increase in EAD volumes, of which only a proportion appear to be a consequence of WES migrations. This growth is also

likely to capture the migration from legacy TI services to Ethernet. A similar pattern is seen for BES and EBD circuits. BES circuits are forecast to decline, whilst EBD circuits are forecast to rise.

A5.51 Table A5.6 below shows the mapping rules we have adopted for the purposes of estimating the costs of providing WES and BES services. For example, the cost of a WES 10Mbit/s service would be assumed with reference to an EAD 10Mbit/s service. For BES services it is possible to migrate either to EAD or EBD, depending on the specific demand characteristics at the location. We are not making the MEA assumption for the above 1Gbit/s WES and BES services, as we have not identified a different MEA for these services.

Table A5.6: Mapping of services between legacy and newer Ethernet services

	MEA equivalent				
Legacy service	**Standard service**	**Aggregation**	**Local access**	**Local reach**	**Extended reach**
WES 2Mbit/s	EAD 10Mbit/s	N/A	N/A	N/A	N/A
WES 10Mbit/s	EAD 10Mbit/s	No MEA equivalent	EAD Local access 10Mbit/s	EAD 10Mbit/	N/A
WES 100Mbit/s	EAD 100Mbit/s	No MEA equivalent	EAD Local access 100Mbit/s	N/A	N/A
WES 155Mbit/s	EAD 1Gbit/s	N/A	N/A	N/A	N/A
WES 622Mbit/s	EAD 1Gbit/s	N/A	N/A	N/A	N/A
WES 1Gbit/s	EAD 1Gbit/s	N/A	N/A	N/A	EAD Extended reach 1Gbit/
BES 100Mbit/s	EAD 100Mbit/s or EBD 1Gbit/s	N/A	N/A	N/A	N/A
BES 155Mbit/s	EAD 1Gbit/s or EBD 1Gbit/s	N/A	N/A	N/A	N/A
BES 622Mbit/s	EAD 1Gbit/s or EBD 1Gbit/s	N/A	N/A	N/A	N/A
BES 1Gbit/s	EAD 1Gbit/s or EBD 1Gbit/s	N/A	N/A	N/A	EAD Extended reach 1Gbit/s or EBD 1Gbit/s
WES 2.5Gbit/s	No MEA equivalent – Services will continue to be provided and no EAD services above 1Gbit/s				
WES 10Gbit/s					
BES 2.5Gbit/s					
BES 10Gbit/s					

Cost forecast assumptions

A5.52 There are a number of assumptions that influence the way in which costs are forecast for present purposes. We set out below an overview of the main ones, specifically:

- operating cost (opex) efficiency;
- return on capital;
- asset and cost volume elasticities (AVEs/CVEs); and
- asset price changes.

Operating cost ('Opex') efficiency

What are efficiency gains?

A5.53 In calculating the value of X for each charge control basket, we have taken into account an assumed efficiency gain that BT is expected to make over the next few years. Greater efficiency is achieved when a given level of output is produced with fewer input resources or when a greater level of output is produced with a given level of input resources. Our proposed efficiency assumption is based on several sources of analysis which assess what BT can realistically achieve in terms of reducing its costs over the period of the proposed charge control.

A5.54 The efficiency rate used in the calculation of the RPI-X cap is the expected year-on-year savings in real unit operating costs that BT is expected to achieve in the normal course of its operations, abstracting from volume and price changes. It is possible to apply this efficiency assumption to both new capital expenditure and operating costs.

A5.55 In our modelling of TI services we have applied the assumption only to operating costs for two main reasons.

a) The forecast decline in volumes for TI services means it is unlikely there will be significant new capital expenditure. The consequence of this is that any potential efficiencies in procurement and investment are not relevant.

b) The other consequence of falling volumes is the associated negative capital expenditure ('capex'), which can be thought of as asset disposals. An efficient operator would be expected to dispose of its unused assets in an efficient manner. Given the type of assets employed in the TI market, it is unlikely that even an efficient operator could command a price for its unused assets higher than the expectations within our model. We therefore set the forecast year-on year efficiency gain for capex at zero and focus on opex.

A5.56 For Ethernet services, we believe that the asset price change adjustments have already taken into account efficiency gains for capital expenditure and so propose to calculate expected efficiency gains for operating costs only. We believe that efficiencies relating to capital expenditure is taken into account through our use of the MEA approach and asset price changes;

- our MEA approach to modelling Ethernet services involves assumptions on the use of the most efficient available technology to deliver the services in question. Under this approach we propose to shift our modelling of costs from being based on the costs of legacy services to being entirely based on the costs of new Ethernet services; and

- our asset price changes take account of changes in the valuation of all assets, including equipment, copper and duct.

A5.57 We assume separate efficiency assumptions for the TI and the Ethernet baskets. This is due to the functional separation of BT Wholesale and Openreach, which supply TI and Ethernet services respectively. It should also be noted that TI and Ethernet services are based on different underlying technologies and use different equipment. In addition, they are at significantly different stages of life, with TI volumes in a state of decline and Ethernet volumes forecast to grow substantially.

A5.58 Based on our assessment of the different sources of information set out below, we propose an efficiency range of:

- 0% to 3% for BT Wholesale's provision of TI services; and
- 2% to 5% per annum for Openreach's provision of Ethernet services.

We propose an operating cost efficiency of 0% to 3% for TI services

A5.59 We have considered a range of indicators to estimate the efficiency improvement that could reasonably be expected from BT Wholesale. These can be categorised into three broad headings:

- TI-specific historic trend analysis;
- BT Wholesale internal efficiency targets; and
- external benchmarking studies.

A5.60 These are summarised in Table A5.7 below (the same table as included in Section 5), including two sets of external benchmarking studies.

Table A5.7: Evidence for TI efficiency assumption

	TI specific historical trend analysis	BT Wholesale internal efficiency targets	2012 Deloitte Study[20]	Statistical analysis (NERA, Deloitte)[21][22]
Efficiency (%)	1.2-2.0%	[✂]	2.25%	~2%
Comments	Ofcom analysis of BT Wholesale's historical TI cost data	Relates only to SG&A costs, which account for only a small proportion of total BT Wholesale costs	Benchmark against five other European operators	Benchmark against US LECs

Note: Other sources of evidence were considered. However for the reasons set out below we did not factor these into our final range.

TI-specific historical trend analysis

A5.61 The trends of reductions in real unit costs in the recent past for a given service offer a useful indicator for expected future efficiency gains. In its decision on the appeal of 'A new Pricing Framework for Openreach", the Competition Commission ('CC') indicated that historical rates "*should be reliable for at least the first year of the price control, and represent useful indicators for the whole period under review*"[23].

A5.62 We have calculated BT Wholesale's underlying rate of real unit cost reduction over the period from 2005/06 to 2010/11. Our approach has been set out in previous

[20] Deloitte, 'Analysis of the Efficiency of BT's Regulated Operations', A report for BT, dated 16 February 2012.
[21] NERA, 17 March 2008, The comparative efficiency of BT Openreach. http://stakeholders.ofcom.org.uk/binaries/consultations/llcc/annexes/efficiency.pdf
[22] Deloitte, 29 March 2011, 'WBA consultation response' http://stakeholders.ofcom.org.uk/binaries/consultations/823069/responses/BT2.pdf
[23] See Paragraph 2.185 CC Determination http://www.competition-commission.org.uk/assets/competitioncommission/docs/appeals/carphone-warehouse-group-plc-local-loop-unbundling-appeals/llu_determination.pdf

consultations (for example, the WBA CC 2011) [24], and is based on total factor productivity ('TFP') analysis. This requires the use of the Tornqvist index, which is a standard measure used in productivity analysis which takes into account the impact of changing cost weights over time. Our methodology is set out below.

- Calculate the output (volume) index change as the sum of all year-on-year volume changes across all cost components.
- Calculate the input (labour and non-labour) index change as the sum of all year-on-year input changes across all cost components.
- Derive the unit output index by dividing the input index by the output index.
- Adjust the unit output index for scale effects (using cost volume relationship assumption consistent with our cost forecasting approach) and any historical catch-up. The remainder represents the historic productivity growth which we assume is equal to future productivity growth.

A5.63 Our approach produces a range of 1.3% to 2.0% for the reduction in the real unit operating costs in the period 2005/06 and 2010/11.

BT Wholesale internal efficiency targets

A5.64 BT's Medium Term Plan ('MTP') is an internal document used for planning purposes within BT. It sets out the financial outlook for BT for the next three years including efficiency targets set internally to BT Group.

A5.65 In response to our information requests, BT supplied to us its MTP which set a target annual efficiency saving for BT Wholesale of [✂] on Selling, General & Administrative Expense (SG&A) costs only[25]. We note however that SG&A costs only make up a small proportion (approximately [✂]) of BT Wholesale's operating costs for the provision of TI services and are unlikely to be typical of the whole set of BT Wholesale costs, meaning that it may not be appropriate to extrapolate from this to the whole of BT Wholesale.

External benchmarking studies

i) 2012 KPMG Study of BT Wholesale

A5.66 Ofcom engaged with BT Wholesale to obtain the necessary data that would allow our adviser, KPMG, to perform an efficiency study similar to that undertaken on Openreach in 2009. In contrast to Openreach, where cost allocation is made at the entity level, cost allocation in BT Wholesale is made at the product and service level. This difference in the approach to cost allocation meant that it was not possible to undertake the planned efficiency study. We considered whether it would be appropriate to undertake a fuller study. However, we determined that an assessment of whether those allocations were efficient would have required a review of a significant proportion of BT's costs more generally, to cover those groups of costs partially allocated to TI. In the context of this charge control we considered that it was not proportionate to undertake such an extensive study.

[24] For further details regarding our approach please see Annex 7 of the WBA CC Consultation: http://stakeholders.ofcom.org.uk/binaries/consultations/823069/summary/condoc.pdf
[25] BT Wholesale response to S135 Notice of 1 July 2011

A5.67 As a result of this, we did not proceed with the study to assess BT Wholesale's efficiency.

ii) BT Wholesale Efficiency Study ('2012 Deloitte Study') [26]

A5.68 The 2012 Deloitte Study was commissioned by BT Wholesale to assess its efficiency relative to five other European operators. Deloitte estimated the model using two different methods, stochastic frontier analysis ('SFA') and corrected ordinary least squares ('COLS'). The estimated coefficients using SFA were found not be statistically different from those estimated using COLS.

A5.69 To perform the analysis, Deloitte collected annual data from six European operators on total costs, switched lines, minutes and bandwidth for the period from 2005 to 2010. Deloitte also made certain adjustments to the data to ensure comparability. They modelled costs as a function of a number of explanatory variables, such as output factors (e.g. number of lines) and environmental variables (e.g. GDP, population density).

A5.70 The results indicated that, of the six operators analysed, BT was the most efficient. In addition, Deloitte indicated that the results of the study suggested a suitable efficiency target for BT would be 2.25% per annum.

iii) The NERA/Deloitte efficiency studies

A5.71 Whereas the 2012 Deloitte study compared BT's efficiency with that of other European operators, earlier studies have compared BT's efficiency with US operators. The NERA efficiency study[27] was commissioned by Ofcom for the purposes of the WLR LLU CC. It was published in December 2008 and was based on stochastic frontier analysis of the Local Exchange Companies ('LECs'), the regional telephone network incumbents in the USA. NERA fitted a cost function using data from the LECs over time, summarising how costs changed according to different types of variables. It then assessed BT's efficiency on a network basis by comparing BT's actual costs to the expected costs by fitting BT's data on the modelled specification.

A5.72 The midpoint of the wide range of possible results from the analysis put BT around the top decile of US LECs ranked by efficiency. NERA's report therefore indicated that BT was already operating at an efficient level when compared to the LECs, so that future cost reductions would come mainly from technical progress rather than by eliminating existing inefficiencies.

A5.73 For the WBA CC, BT commissioned Deloitte to produce an updated version of the efficiency report ('2011 Deloitte Study')[28], which made use of additional data. Deloitte claimed that the results of their study suggested an appropriate efficiency range of 0.6% to 2.8%.

Evaluation of evidence and proposal for efficiency assumption for TI services

A5.74 To arrive at an appropriate range of efficiency savings, we consider that most weight should be placed on the sources of evidence which are specific to the TI

[26] Deloitte, "Analysis of the Efficiency of BT's Regulated Operations", A report for BT, dated 16 February 2012.
[27] NERA, 17 March 2008, "The comparative efficiency of BT Openreach."
http://stakeholders.ofcom.org.uk/binaries/consultations/llcc/annexes/efficiency.pdf
[28] http://stakeholders.ofcom.org.uk/binaries/consultations/823069/responses/BT2.pdf

market, i.e. the historical trend analysis. Our historic trend analysis suggests that a range of 1% to 2% would be appropriate to use in our sensitivity analysis.

A5.75 We have also considered BT's internal planning documents as a potential additional indicator of expected future efficiency savings. This source suggests efficiency savings of [✂] are achievable. However, that figure is based only on SG&A costs, which account for a small proportion of BT Wholesale's operating costs for the provision of TI services (approximately [✂] in 2010/11). We believe that this does not cover a sufficiently wide range of BT Wholesale's activities for it to be extrapolated and applied to BT Wholesale's provision of TI services. Therefore, we have chosen not to place significant weight on this source relative to the historical trend analysis.

A5.76 The benchmarking studies conducted by Deloitte and NERA are not specific to the TI market, although they represent the scope for efficiency improvements for the organisation as a whole. We place relatively less weight on these results compared to the TI-specific analysis of historic data.

A5.77 Considering the 2012 Deloitte study, we have some concerns about the robustness of the results. The data set used contains very few cross-sectional observations with little variation over time, meaning the sample size is unlikely to be sufficient to produce reliable estimates. The set of 30 observations is considered a minimum sample size, although we note that the data used in this study does not consist of 30 independent observations but repeated observations of the same six operators over time. We believe that the very high R-squared (97%) produced by the results is consistent with our concern, as it suggests the model is over-fitted, i.e. the model includes too many explanatory variables relative to the number of independent observations.

A5.78 In addition to this, the methodology 'pools' the data from the six operators together as if they are individual observations. Fitting an equation on this basis imposes a very strong requirement on the data. That is, any element of an operator's cost which is unique to that operator and fixed over time is unrelated to all the explanatory variables in the equation. We consider there are a number of reasons why this assumption may not hold, in particular the possibility that operator efficiency is relatively constant over the time period considered. Deloitte have not provided any justification to support their implied assumption using this methodology. The study also notes the high degree of collinearity between the explanatory variables. Whilst we agree that in a purely statistical sense, collinearity does not bias an estimate, it is known to produce unreliable results, i.e. inflating variance and magnifying any bias in the model. For these reasons, we place little weight on this study for the purposes of determining a suitable efficiency assumption.

A5.79 The original NERA study conducted in 2008 outlined some of the limitations of its analysis due to difficulties in comparing US LEC and BT's data directly. Further, we disagreed with some aspects of Deloitte's approach in their follow-up studies. Our considerations in that regard are set out in Annex 7 of the WBA CC Consultation[29].

A5.80 Nevertheless, we note that the results from each of these benchmarking studies are consistent with our other sources of evidence and therefore support our proposed efficiency range.

[29] See Annex 7: http://stakeholders.ofcom.org.uk/binaries/consultations/823069/summary/condoc.pdf

A5.81 In light of the considerations discussed above, we propose that an appropriate efficiency range for BT Wholesale's provision of TI services is 0% to 3%. We note that this range may be considered a relatively low target for efficiency improvements compared to those used in other charge controls on BT. However, TI services are a mature and declining set of markets and we believe that there is no reason that would justify making a stronger efficiency assumption. The proposed range reflects the relative weights we have placed on the different sources of information as well as providing a wide enough range to assess the sensitivity of our base case proposals.

We propose to use an operating cost efficiency assumption of 2% to 5% for Ethernet services

A5.82 We have considered a range of indicators to estimate the efficiency improvement that may reasonably incentivise Openreach to bring its costs in line with those of an efficient operator. They can be categorised into four broad headings:

- Ethernet-specific historical trend analysis;
- Openreach-specific historical trend analysis;
- Openreach internal efficiency targets; and
- external benchmarking studies.

A5.83 These are summarised instable 5.8 below (the same table as included in Section 6), including two sets of external benchmarking studies.

Table A5.8 Evidence for Ethernet efficiency assumption

	Ethernet-specific historical trend analysis[30]	Openreach internal efficiency targets[31]	2012 Deloitte Study[32]	Statistical analysis (NERA, Deloitte) [33][34]	KPMG study
Efficiency (% per annum)	2.7-4.6%	[≫]%	2.25%	~2%	2.3-2.6%
Comments	Ofcom analysis of Openreach's historical cost data	Internal targets set for the subsequent 3 years	Benchmark against 5 other European operators	Benchmark against US LECs	Excludes fault rates and task times

Ethernet-specific historical trend analysis

A5.84 We have attempted to conduct a similar analysis of historical trends of Ethernet services as we have undertaken for TI services. However, it was not possible to obtain meaningful or robust results for the following reasons.

[30] Ofcom analysis of BT Group response to S135 Notice of 1 July 2011.
[31] BT Group response to S135 Notice of 1 July 2011.
[32] Deloitte, "Analysis of the Efficiency of BT's Regulated Operations", A report for BT, dated 16 February 2012.
[33] NERA, 17 March 2008, "The comparative efficiency of BT Openreach." http://stakeholders.ofcom.org.uk/binaries/consultations/llcc/annexes/efficiency.pdf
[34] Deloitte, 29 March 2011, "WBA consultation response" http://stakeholders.ofcom.org.uk/binaries/consultations/823069/responses/BT2.pdf

- The relationship between cost components and the underlying services has changed over the time period considered (2007/08 to 2010/11). This means that costs have not been allocated to the components on a consistent basis.

- Cost and volume data for Ethernet services are available for four years from 2007/08 to 2010/11. As a result, trend data (differences between one year and the next) are only available for three years. This, coupled with the fact that there are only a limited number of components relating to Ethernet services, result in there being a low number of observations from which to extrapolate a trend.

A5.85 As a result, we have focused on the historical trend analysis for Openreach as a whole.

Openreach-specific historical trend analysis

A5.86 We have conducted an analysis of Openreach's historical efficiency savings in operating costs. We estimate that Openreach delivered the following efficiency savings:

Table A5.9: Evidence for Ethernet efficiency assumption

	2007/08	2008/09	2009/10	2010/11
Ofcom estimate of Openreach operating cost efficiency	[✂]	[✂]	[✂]	[✂]

A5.87 The data set analysed is similar to that used for the recent WLR LLU CC Statement[35], except that for reasons set out above, we have analysed only savings in operating costs, rather than both opex and capex.

A5.88 Openreach has argued these savings are not indicative of future efficiency gains as some of the savings were one-off in nature. However, consistent with our approach in the WLR LLU CC, we have excluded BT's cumulo bill as this was a step change in 2010/11[36]. The step change in cumulo liability has arisen due to the switch from the 2005 ratings assessment to the 2010 assessment.

A5.89 On this basis, we calculate that over the period from 2007/08 to 2010/11 BT has achieved annual efficiency savings ranging between 2.7% and 4.6%.

Openreach-specific internal efficiency targets

A5.90 As noted above, Openreach's MTP is an internal document used for planning purposes within BT. It sets out the financial outlook for the company for the next three years and sets efficiency targets for each line of business.

A5.91 Using Openreach's break-down of their efficiency targets, we have calculated a figure based on operating cost efficiency savings as a proportion of total operating costs, as shown in Table A5.9[37].

[35] See Annex 3 of the WLR LLU Statement: http://stakeholders.ofcom.org.uk/binaries/consultations/wlr-cc-2011/statement/annexesMarch12.pdf
[36] Cumulo rates are the business rates paid by BT Group on its network business. These relate to the use of public land for assets such as poles, duct, street cabinets and the equipment in exchange buildings.
[37] BT Group response to S135 Notice of 1 July 2011

Table A5.10: Openreach Medium Term Plan targets

	2011/12	2012/13	2013/14	2014/15
Efficiency target	[✂]	[✂]	[✂]	[✂]

A5.92 Openreach's MTP shows that Openreach has targets of between [✂] and [✂] reductions in operating costs over the period from 2011/12 to 2014/15.

Other external benchmarking studies

i) 2012 Deloitte Study

A5.93 The 2012 Deloitte Study was carried out using data for BT as a whole, not specific to BT Wholesale or Openreach. A brief summary of the study is set out in paragraphs A5.68 and A5.70.

ii) KPMG Study

A5.94 For the purposes of the WLR LLU CC Consultation, KPMG undertook an analysis for Ofcom which estimated the efficiency gains that could be achieved by Openreach until 2012/13 through benchmarking operating cost components[38]. This was subsequently updated and is explained further in Annex 3 of Ofcom's 2012 WLR LLU CC Statement[39].

A5.95 KPMG concluded from the updated analysis that Openreach could deliver average efficiency gains of 2.3-2.6% per annum between 2010 and 2014 on its operating cost. As explained in the full report, KPMG has looked specifically at benchmarking operating cost categories; therefore these percentages represent the potential reduction in costs before any changes in fault rates and task times. A decrease in fault rates or task times is likely to increase the scope for BT to deliver efficiency improvements. In contrast, a reduction in these would tend to increase BT's ability to deliver efficiency improvements.

iii) NERA Study and Deloitte 2010 Study

A5.96 See discussion at A5.70 to A5.72 above.

Evaluation of evidence and proposal for efficiency assumption for Ethernet services

A5.97 As with TI, we consider it is appropriate to place most weight on the sources of evidence which are most relevant to Ethernet services. In the absence of historical trend analysis specific to Ethernet services, we have placed most weight on the past and projected efficiency savings achieved by Openreach. Over the four years from 2007/08 to 2010/11, we calculate that Openreach achieved operating efficiency savings ranging from 2.7% to 4.6%. We note that, for the purposes of the proposed charge control, we need to extrapolate significantly into the future. As we forecast further into the future, the predictive power of this past trend is reduced. Nevertheless, it forms a useful starting point.

[38] KPMG "Efficiency Review of BT Openreach" March 2010. http://stakeholders.ofcom.org.uk/binaries/consultations/wlr-cc-2011/annexes/Efficiency_Review_Report.PDF

[39] http://stakeholders.ofcom.org.uk/consultations/wlr-cc-2011/?a=0

A5.98 We have placed less weight on BT's internal planning documents and an extrapolation of their latest rolling forecast. These contained targets for efficiency savings of [✂]. We are also mindful of the need for Openreach to have incentives to make efficiency improvements. If Openreach's internal targets form the basis of the charge control (and so are all passed onto consumers), then Openreach could face reduced incentives to make such efficiency savings in future.

A5.99 We consider that the benchmarking studies conducted by NERA and Deloitte are less specific to Ethernet services and therefore have attributed little weight to these. In addition, the NERA study and the 2008 and 2011 Deloitte studies which made use of the US LEC data were problematic due to data not being directly comparable. We also have concerns over the 2012 Deloitte study due to a limited number of observations in the sample, and minimal variation in the output variables (explained in more detail in paragraphs A5.71 to A5.81). Nevertheless, we note that these suggest efficiency savings in the region of 0.6% to 2.8% per annum.

A5.100 From our consideration of the available evidence, we have proposed an efficiency rate for the provision of Ethernet services of 2% to 5% per annum gross. This places most weight on the historical evidence of efficiency gains made by Openreach.

A5.101 This target is consistent with that made under the WLR LLU CC, given that we focus only on opex efficiency saving, rather than including capex efficiency as well[40]. We also note that, whilst this target range is below the internal targets set in the MTP, we believe it is realistic and provides Openreach with an incentive to meet those internal targets and outperform the targets proposed under the charge control.

Return on Capital

A5.102 We have included in BT's cost base a return on capital that is equal to its WACC. The WACC is the minimum return required on BT's investments.

A5.103 As discussed in Section 5 and 6, we apply a cost of capital in the range of 5.5% to 7.5% for both the TI and Ethernet services. The methodology behind this proposal is explained in Annex 7 on the Cost of Capital.

Asset and cost volume elasticities (AVEs/CVEs)

A5.104 The impact that forecast changes in volumes have on forecast costs in our model (before efficiency improvements are taken into account) is determined by asset price elasticities (AVEs) and cost volume elasticities (CVEs).

- **AVEs** are used to determine the level of capital costs needed in response to changes in demand (an AVE is defined as the percentage change in assets, valued at gross replacement costs, for a 1% change in volumes).

- **CVEs** are used to determine the level of operating costs needed in response to changes in demand (a CVE is defined as the percentage change in operating costs for a 1% change in volumes).

[40] Note that we account for Capex efficiency gains in other ways, as explained at paragraph in Section 4.

A5.105 An elasticity of one would indicate that costs change proportionately with volumes (resulting in constant unit costs) whilst an elasticity of zero indicates that total costs are fixed (and therefore unit costs will have an inversely proportional relationship with volumes).

A5.106 As explained in Section 5, we have considered a number of options when deciding on which values to use for the AVEs and CVEs, both for TI services and Ethernet services, as set out below.

- **Option 1.** Use the AVEs and CVEs from the 2009 Leased Lines Charge Control ('LLCC').
- **Option 2.** Base the AVE and CVE estimates on an analysis of how actual costs have changed in the recent past as volumes of TI and Ethernet services have changed.
- **Option 3.** Use AVEs and CVEs submitted by BT Wholesale and Openreach in response to a formal information request.
- **Option 4.** Assess BT Wholesale and Openreach submissions under Option 3 and make certain adjustments.

A5.107 We propose to adopt Option 4. We consider that this provides the most reliable estimates of AVEs and CVEs, since the values submitted by BT Wholesale and Openreach are based on the most up-to-date information, but require certain adjustments for the purposes of the proposed charge control.

A5.108 We explain in more detail below the options and the reasons for our proposed approach in more detail below.

Option 1: AVEs and CVEs from LLCC 2009

A5.109 We have assessed the AVEs and CVEs that were used in the LLCC 2009 (as shown in the Table A5.11) and considered whether it would be appropriate to simply apply the same values for our proposed charge control. We consider that this option would be inappropriate, since the AVEs and CVEs used in the LLCC 2009 were based on a top-down model of BT's costs that formed part of the 1997 Network Charge Controls[41]. We no longer believe we can rely on these estimates, since they were calculated over ten years ago and it is likely that the relationship between costs and volumes will have changed since then.

[41] http://www.ofcom.org.uk/static/archive/oftel/publications/1995_98/pricing/nccjul97.htm

Table A5.11: AVEs and CVEs from LLCC 2009

	Cost category	Assumed value
AVE	Cable	0.20
	Duct	0.05
	Local Exchange	0.55
	Main Exchange	0.70
	Transmission	0.65
	Other Network Equipment	0.65
	Motor Transport	0.40
	Land & Buildings	0.20
	Computers and OM	0.74
	Other	0.64
	Weighted Average	**0.39**
CVE	Pay	0.24
	Non-pay	0.24
	Weighted Average	**0.24**

Option 2: Estimate AVEs and CVEs based on recent volume and cost changes

A5.110 We have also considered whether changes in volumes and costs in recent years could provide estimates of how costs should vary as volumes of leased line services change in the future. We have found that such estimates are highly dependent on certain assumptions, such as the extent of efficiency gains made by BT and the allocation of costs across a varying mix of services[42]. Given that the precise values of these assumptions are uncertain and because relatively small variations in the assumptions have a significant impact on how costs are estimated to change with volume, it has not been possible to calculate reliable estimates in this way.

A5.111 We note that that, in our proposals for the efficiency estimates, we have placed a greater weight on historic efficiency gains based on BT Wholesale's actual costs and volumes. We consider that this is consistent with our approach here, especially considering that the range of efficiency estimates provided by historic analysis is supported by other sources.

Option 3: BT submissions for the proposed charge controls

A5.112 We have received submissions from BT Wholesale and from Openreach on AVEs and CVEs in response to our information request. Both BT Wholesale and Openreach have submitted data based on BT's 'LRIC model', as set out in the Table A5.12. BT Wholesale has also provided 'End of life' AVEs and CVEs.

[42] For instance, for TI services, varying the efficiency assumption from 1% to 2% changes the implied CVE from 0.08 to 0.58.

Table A5.12: BT's AVE and CVE submissions for 2012 LLCC

	Cost category	BT Wholesale LRIC model AVE[43]	BT Wholesale 'end of life' AVE[44]	Openreach LRIC model AVE[45]
AVE	Cable	0.13	0.60	0.13
	Duct	0.08	0.60	0.08
	Local Exchange	0.70	0.60	0.63
	Main Exchange	NA	NA	0.47
	Transmission	0.83	0	0.83
	Other Network Equipment	0.72	0	0.72
	Motor Transport	0.76	0.76	0.76
	Land & Buildings	0.70	0	0.70
	Computers and OM	0.83	1	0.83
	Other	0.72	0	0.72
	Other Intangibles	0.72	0	0.72
	Ethernet Electronics	N/A	N/A	0.92
	21CN Electronics	N/A	N/A	0.47
	Weighted Average	**0.38**	**0.38**	**0.38**
CVE	Pay	0.63	0.40	0.57
	Non-pay	0.53	0.23	0.41

A5.113 The 'LRIC model' estimates of AVEs and CVEs submitted by BT Wholesale and Openreach are based on BT's methodology for allocating costs across services to calculate LRIC and other cost measures. They are calculated by first obtaining an estimate of Cost Volume Relationships ('CVRs') for each category of cost, asset and liability. These CVRs describe what level of cost, asset or liability is expected at each level of volume of the appropriate cost driver and they are calculated using engineer simulation models, statistical surveys, interviews and field research. The CVRs are then used to derive a calculation of the LRIC, given the level of Fully Allocated Costs ('FACs'). The ratio of LRIC to FAC then provides an estimate of the AVEs and CVEs[46].

A5.114 We consider that the estimates contained in the submissions from BT Wholesale and Openreach have the advantage that they are based on up-to-date information that is consistent with BT's cost allocation system and the way FACs for each service are determined, However, we have a number of issues with adopting these values for the purposes of forecasting efficient forward-looking costs, which we discuss in turn below:

LRIC versus DLRIC estimates

A5.115 BT had initially submitted AVEs and CVEs based on distributed LRIC ('DLRIC'), rather than LRIC. The DLRIC measure includes an allocation of fixed and common costs which, by definition, are not variable. Using these for forecasting costs would therefore lead to an over-estimate of costs because it includes additional costs that would, in practice, be fixed as volume increases (and vice versa). As such we requested that BT submit these values based on LRIC, rather than DLRIC.

[43] BT Wholesale response to S135 Notice of 21 May 2012.
[44] BT Wholesale response to S135 Notice of 21 May 2012.
[45] Openreach response to S135 Notice of 25 May 2012.
[46] Long Run Incremental Cost Model: Relationships and Parameters, BT Group plc 2011

Weighting of CVEs by AVEs

A5.116 BT has proposed that 'indicative' CVE values derived from their LRIC to FAC analysis should be multiplied by the corresponding AVEs to arrive at a 'true' CVE because it argued that many of the pay and non-pay costs were themselves dependent on the asset volume relationships[47]. In this sense, operating costs would be realised according to the assets that were deployed, rather than being solely and directly caused by a change in service volumes. We consider this to be reasonable for many operating costs such as maintenance and power.

A5.117 We note that this is also consistent with the explanation provided by BT Wholesale on how it has calculated geographically disaggregated costs for the WECLA and the rest of the UK. BT Wholesale submitted cost data that varies by the volume of equipment in a local exchange, rather than directly varying with service volumes.

The inclusion of fixed costs

A5.118 The LRIC of a product or service may include some fixed costs incurred in its provision[48]. If only modest volumes changes are predicted, then a LRIC to FAC ratio may overstate the true AVE and CVE. However, in the context of the present charge control, we forecast that the number of Ethernet circuits will increase by more than 140% relative to 2010/11 and that there will be a comparable decline of over 70% for TI circuits. Given the scale of the forecast volume changes, a ratio of LRIC to FAC may not be an unreasonable approximation.

A5.119 In relation to operating costs, the multiplication of AVEs by CVEs, alleviates some of our concerns over the inclusion of fixed costs because operating costs would only change when there are underlying changes in fixed assets. However, we do not think this is appropriate for all cost categories. In particular, we are concerned about the cost category 'General Management and Other'. This category accounts for [✂] of total pay operating costs and [✂] of total non-pay operating costs. It is also treated as nearly fully variable with volume changes. BT has explained that this cost category included a large number of different costs, some of which are variable with output and others which were an allocation of management costs.

A5.120 We consider that, as volumes increase, there would be some increase in management costs. However, we do not believe that the 'General Management and Other' category would be expected to vary to the same extent as other operating costs (e.g. maintenance).

A5.121 It is difficult to assess the exact level of adjustment which would be appropriate but we believe it should reflect:

- our analysis of the proportion of such administration and management costs which are likely to relate to operations of the overall network assets and customers, rather than specific assets within the network or managing the changing customer base;

- the potential incentives on BT to manage and allocate its costs to reflect changes in volumes, if it perceives that Ofcom will take account of CVEs in setting charge controls; and

Openreach response to S135 Notice of 4 April 2012.

[48] In the long run, on which LRIC is based by definition, all costs are variable. However, LRIC will include some costs that are fixed in the short run.

- the size of any impact on BT and on customers of any difference between our assumption, and BT's actual ability to manage costs with changing volumes over the charge control period.

A5.122 In general, we would expect pure overheads to be a relatively small proportion of these costs, and this is consistent with BT's published data in respect of the scale of general and administration overhead costs within its business more generally[49]. Our modelling also indicates that the choice of CVE has a small impact on BT and on customers generally, as indicated by our sensitivity analysis below. The net impact across the growth in Ethernet and decline in TI is small. This will also imply that the incentive properties of our proposals will be modest. Based on our analysis of the data available on the level of such shared costs within BT's data, and taking into account the limited impact of such an adjustment within the charge control, we propose that it is appropriate to make an adjustment of 10% to reduce BT's CVEs in the categories of General Management and in respect of those overhead costs not linked to specific assets, including administration costs.

Weighting of component CVEs by means of an arithmetic average

A5.123 BT calculated its LRIC to FAC ratios on a component by component basis. To arrive at its overall CVEs it calculated a simple average across all components, rather than a weighted average.

A5.124 We have some concerns about the use of the simple average and believe that it may result in inputs to our charge control model that are not consistent with the way the CVEs are derived.

A5.125 Since our model is based on largely the same set of components as the ones BT provided, we believe it is more appropriate to use the unweighted component values for each of the identified components, rather than using the simple average for all components. We believe this is appropriate as the volume changes across these components are not homogeneous and that the CVE values are used in a way that is consistent with their derivation.

'End of life' AVEs and CVEs

A5.126 BT Wholesale also calculated an 'end of life' view of AVEs and CVEs. These reflect the different relationships between costs and volumes when there are reductions in volumes, as opposed to when there are increases. That is, some costs may fall particularly slowly if they must be incurred to ensure that the platforms can be kept operational, whereas certain costs are likely to fall in proportion to falls in volumes and some assets may be recovered through other services.

A5.127 For instance, BT Wholesale argues that the need to continue supporting the PPC platform while volumes decline means that some costs are "sticky downwards", so that a lower AVE/CVE would be more appropriate compared to one estimated by its LRIC model, e.g. the AVEs on Transmission and Other Network Equipment and the CVEs on Finance & Billing and Accommodation). In contrast, it also believes that some costs can be re-used by other services as PPC volumes decline, so that a

[49] See, for example, http://www.btplc.com/sharesandperformance/annualreportandreview/pdf/btgroupannualreport2011.pdf page 48

higher AVE/CVE might be applicable to reflect this (e.g. the AVEs on Cable and Duct and the CVEs on General Support and Provision & Installation)[50].

A5.128 Whilst we believe there may be some merit in the views put forward, we do not think that they are applicable in general. We expect the greater 'lumpiness' reflected in the 'end of life' values (as costs would be forecast to decline relatively more slowly as volumes fall) would be smoothed out over the longer term. We also think that the binary nature of several of the 'end of life' values (such as the AVEs for Transmission and Other Intangibles) appear to be an extreme approximation of the potential cost-volume relationships and do not appear to have been subject to the same level of derivation as the 'LRIC model' values that BT has submitted.

A5.129 BT Wholesale also suggests that the CVE on Accommodation for DPCN equipment should be zero, as the volume of DPCN equipment and its footprint within exchanges is unchanged in the past four years, despite falls in the volume of sub-2Mbit/s circuits[51]. However, the volumes of sub-2Mbit/s circuits have only declined slightly over this time period[52]. Given the relatively small change in volumes, we do not believe that a lack of change in accommodation costs provides strong evidence of costs being particularly sticky downwards.

A5.130 For these reasons, we consider that it would not be appropriate to apply the 'end of life' values to our modelling of TI services.

A5.131 We also note that our proposed reallocation of costs from the TI basket to the Ethernet basket reflects the potential for the rising volume of Ethernet service to use assets that are no longer used by the falling volumes of TI services.

Option 4: BT submissions with Ofcom adjustments

A5.132 Given the reservations explained above, we propose that it would be appropriate to make the following adjustments to BT's submitted AVEs and CVEs:

- apply the individual component-level AVEs and CVEs rather than using an arithmetic average of each of these values;
- weight the 'indicative' CVEs by the corresponding AVEs to get a final CVE; and
- make a reduction of 10% to the submitted CVE for the category of 'General Management and Other' and for the CVEs for other categories of administration costs not linked to specific services.

A5.133 If such adjustments are made, we consider that it would be appropriate to use BT's submitted AVEs and CVEs, together with our proposed adjustments, in our charge control modelling.

Asset price changes

A5.134 Asset price changes have offsetting effects on the cost base for two main reasons, namely:

[50] BT Wholesale response to S135 Notice of 21 May 2012.
[51] BT Wholesale response to S135 Notice of 21 May 2012.
[52] BT Wholesale response to S135 Notice of 21 May 2012.

- the first is a holding gain as a result of the asset price increases - such a gain reduces costs in the year that it occurs, the reverse is true for holding losses; and

- the second effect is the impact on the real return. An asset price rise increases the value of the asset base, and therefore increases the required return in the cost base. Similarly, a fall in the asset price would reduce the value of the asset base and in turn reduce the cost base to be recovered through the charges in the charge control basket.

A5.135 As a result, the impact of real price changes depends on which effect dominates and it is not known a priori whether it will increase or decrease the overall cost base.

A5.136 Real holding gains or losses are created where asset prices change at rates other than RPI. Forecasting asset price changes is clearly a challenging task. In the LLCC model, we have taken an average of asset price changes over the past five years, as supplied by BT, and these are shown in Table A5.13 below (the same table as used in Section 5). We have assumed that the real asset price changes apply over the period from 2012/13 to 2015/16.

Table A5.13: Asset price changes assumed in Ofcom's cost forecasts

Asset	5 year average nominal price change between 2006/07 and 2010/11	Real price change
Duct	3.6%	0.0%
Local Exchange	-0.1%	-3.6%
Main Exchange	0.0%	-3.4%
Transmission	-0.2%	-3.6%
Other Network Equipment	0.0%	-3.4%
Motor Transport	0.0%	-3.4%
Land & Buildings	0.1%	-3.3%
Computers & OM	0.0%	-3.4%
Other intangibles	0.0%	-3.4%
Other	-0.3%	-3.8%
Cable – Copper*	4.7%	1.7%
Cable - Fibre	1.9%	-1.6%

* For copper cable we use the five year average from 2005/06 to 2010/11 excluding 2009/10 due to one off events in 2009/10

A5.137 For copper cable, we use the five year average from 2005/06 to 2010/11 excluding 2009/10 data. This is because in the year 2009/10 there was a very significant increase in the price of copper driven by the recovery of the world economy. We consider that the 2009/10 increase was a one off and would distort the average if included.

A5.138 As regards the cost categories of "Other network equipment", "Motor Transport", "Computers & OM" and "Other", we consider that they have zero holding gain or loss. This is because these assets are now valued at historical cost, and they are therefore to be consistent with the accounting treatment of these assets.

Consequently, they do not have a holding gain/loss. This means their values reduce in real terms over the duration of the charge control[53]. '

A5.139 To forecast the value of duct, we assume that the nominal changes in the price of duct in the future will equal RPI. A five year average is not representative of future duct values given a large one off holding gain on duct in 2009/10 and a holding loss in 2010/11 that occurred for reasons that did not involve changes to the underlying asset. The use of RPI to forecast the value of duct is consistent with Ofcom's view of the RAV approach. A detailed description of the approach is available in the WLR LLU CC.

We do not propose start charge adjustments for TI or Ethernet services

A5.140 A key element in the value of X is the assumed starting level of prices. We use those prices expected to be in effect on 30 September 2012. Under certain circumstances we may propose to make one-off adjustments to starting charges in order to bring about changes at the start of the charge control. The value of X would then be calculated to take this adjustment into account. Where such an approach is adopted, we need to balance the trade off between one-off changes versus implementing changes through the glide-path.

A5.141 As discussed in Section 4, we consider that a glide path approach is appropriate for these proposed RPI-X controls. However, there may be circumstances under which we might consider one-off adjustments to BT's prices to be implemented at the start of the new charge control period. This might include, for example, scenarios where:

- there are strong allocative efficiency arguments for bringing prices into line with cost sooner; and/or
- the previous charges were unregulated or not subject to a charge control and the positioning of BT's charges relative to costs.

Assessment of BT Wholesale charges for TI services

A5.142 The services we model for setting the value of X for the TI basket includes all PPC services, Netstream, RBS backhaul and SiteConnect. Of those services, only PPCs are currently explicitly charge controlled, with the other services indirectly controlled through their use of the same underlying cost components.

Assessment of BT Wholesale's current charges

A5.143 For PPC services there is a direct relationship between the charging structure and how costs are allocated and reported in the RFS. For example, a 2Mbit/s trunk service attracts a current charge of £45.28 per kilometre. This compares against fully allocated costs of £24.89 in 2010/11[54]. This is not the case for Netstream, RBS backhaul and SiteConnect services, where the charging structure was simplified in

[53] The 'Other' category also includes 21CN assets that were revalued for the first time in 2010/11. As we removed 21CN assets from modelling for TI as a result of anchor pricing approach, the historical asset price change applies. In any case, the revaluation effect is small and does not change the 5 year average.

[54] See page 73 of BT's 2011 Regulatory Financial Statements available at http://www.btplc.com/Thegroup/RegulatoryandPublicaffairs/Financialstatements/2011/CurrentCostFinancialStatements2011.pdf.

terms of circuit rentals but the costs are disaggregated into the underlying components, i.e. local ends, links, terminating and trunk kilometres.

A5.144 For each of the PPC services, we have carried out the analysis as set out below.

- We have calculated the 2010/11 ratios of DSAC to FAC and DLRIC to FAC as reported in the RFS.
- Given our proposed cost adjustments and other assumptions, we have arrived at a different FAC compared to those reported in the RFS in 2010/11. Based on our forecast assumptions, we have also been able to calculate what these FACs might be at the start of the charge control in 2012/13.
- Assuming that DSACs and DLRICs also follow the general trend in FACs, we can estimate what these are in 2012/13 by multiplying the forecast FACs with the 2010/11 ratios.
- We have compared what BT's start charges would be against the DLRIC and DSAC estimates for 2012/13.

A5.145 Based on the 2010/11 RFS, we note that all of BT's charges appear to be below DSAC, but that there are a number of charges appear to also be below DLRIC. Given the overall trend of reducing volumes, this would imply increases in unit costs, which would result in a larger gap between these charges and the DLRIC estimate at the start of the charge control. We do not consider it is appropriate to make upward adjustments to these charges. This is because some of the increases in unit costs are due to fixed costs spread over declining volumes. If prices were to reflect this, this would result in steeply increasing charges. At the extreme, it would result in the last customers paying the full cost of running the network. As such, we believe that increasing charges to fully reflect this would not be consistent with our objectives of protecting customers, and ultimately, consumers. Furthermore, such increases could result in revenues in the final year being sufficient to more than recover costs, resulting in a positive X in the RPI-X control formula. This may then result in a zig-zag profile of charges where they initially increase but have to be brought down over the charge control period. We therefore do not propose any one-off adjustment to TI charges at the start of the charge control.

Assessment of BT Wholesale's charging structure

A5.146 C&WW brought appeals against the LLCC 2009 and raised issues relating to the one-off adjustments proposed. As part of C&WW's Notice of Appeal ('NoA') it identified a number of examples that it claimed demonstrated that the resulting structure of charges was "inefficient, discriminatory and distorts competition" [55]. The CC ruled that *"C&W failed to demonstrate that Ofcom erred in adjusting some prices and not others within the TI basket*" for the reasons it had set out.

A5.147 Our assessment of current charges based on the RFS did not suggest the need for one-off adjustments to TI charges. In the sections below, we explain our

[55] Cable & Wireless UK v Office of Communications (Leased Lines Charge Control), Case 1112/3/3/09, Notice of Appeal, http://www.catribunal.org.uk/237-4334/1112-3-3-09-Cable--Wireless-UK.html

considerations as to whether the observations C&WW made still persist and, if so, whether there is a case for making one-off adjustments to PPC charges[56].

DPCN versus 2Mbit/s circuits

A5.148 C&WW observed that it was more expensive to use some DPCN circuits than 2Mbit/s circuits. Its assessment was based on average circuit distances for the different bandwidths, comparing average monthly rental prices and assuming a contribution to other charges from connection, POH and DPCN bearers[57]. C&WW argued that, as CPs purchase more nx64kbit/s circuits[58], they were charged more compared to a 2Mbit/s circuit.

A5.149 BT Wholesale sells nx64kbit/s circuits as multiples of 64kbit/s circuits and this is reflected in BT Wholesale's current charges[59]. For example, a 256kbit/s circuit attracts twice the charge for main link, terminating and trunk segments compared to a 128kbit/s circuit. As more 64kbit/s circuits are bundled together, these charges can mount up and can result in higher per kilometre charges than a 2Mbit/s circuit.

A5.150 As part of Ofcom's response to C&WW's observation[60], we noted that the costs of providing DPCN circuits were higher than costs of providing a 2Mbit/s local end. BT's Statement of Intervention ('SoI') further explained that the difference in technology is one of the reasons for this. The CC supported this and concluded that "*it would appear difficult to make comparisons between DPCN and non-DPCN services as they are* underpinned *by different technologies*". On this basis, we considered that the price differential between DPCN and 2Mbit/s circuits is not an anomaly and therefore that it is appropriate to allow BT the freedom to set its own pricing structure for them, subject to the constraints of the charge control conditions.

DPCN terminating versus trunk charges

A5.151 C&WW's second observation was that DPCN trunk charges were more than three times DPCN terminating charges. It argued that this was illogical because (i) there was little difference between trunk and terminating segments from an engineering perspective, and (ii) if there was a difference, trunk should be priced lower than terminating segments as economies of scale should make the costs of trunk lower than the costs of terminating segments. C&WW also argued that there should be no difference between the relative prices of DPCN trunk and terminating segments and non-DPCN trunk and terminating segments.

A5.152 We noted[61] that trunk charges were brought into the charge control for the first time as a result of the BCMR 2008[62]. BT's SoI argued that the new pricing structure proposed in LLCC 2009 "*rebalanced the charges between trunk and terminating*

[56] See paragraph 3.218 of the Competition Commission's Determination, 30 June 2010, available at the above link.
[57] These assumptions were presented as evidence in the LLCC appeal, and are now archived. We can obtain these if necessary.
[58] A PPC operating at nx64kbit/s is a wholesale circuit from a Third Party Customer Link to a CP's Point of Handover. These circuits are available at bandwidths from 128kbit/s to 960kbit/s in increments of 64kbit/s.
[59] PPC charges are available at: https://www.btwholesale.com/pages/downloads/service_and_support/pricing_information/carrier_price_list/browsable_carrier_price_list/section_b3/B8.03.rtf
[60] See paragraph 3.236 of the Competition Commission's Determination, 30 June 2010.
[61] See paragraph 3.230 of the Competition Commission's Determination, 30 June 2010.

segments and aligned prices more closely with costs". The CC concluded that there was "*not sufficient evidence to support the allegation that the structure of charges … is anti-competitive*". Again, in relation to the relative trunk and terminating prices for DPCN and non-DPCN circuits, BT submitted that there was no correlation between the cost ratios at different bandwidths, and that the two types of services are delivered using different technologies.

A5.153 For the purposes of this charge control we carried out an assessment of current PPC charges. We find that for nx64kbit/s circuits trunk charges (including main link, on a per kilometre basis) are lower than terminating segments for average circuit lengths. For higher bandwidth circuits, this holds true for average externally-purchased circuits, which are significantly shorter than average internally-consumed PPC circuits. Given these developments since the start of the existing charge control, we consider that it is appropriate to delegate pricing decisions on relative charges to BT, subject to the constraints of our proposed charge control.

Trunk charges at different bandwidths

A5.154 C&WW observed that the per kilometre charge for some DPCN trunk products were higher than the per kilometre charge of 2Mbit/s trunk.

A5.155 Figure A5.11 below compares trunk charges by bandwidth based on BT Wholesale's Carrier Price List from 1 October 2009 (start of the existing charge controls) with the latest prices as at 1 October 2011. It shows that trunk charges in general have reduced during the two year period, and in particular, 64kbit/s trunk charges have reduced relative to 2Mbit/s charges. However, it is still the case that the per kilometre charge for some DPCN trunk products is more expensive than some 2Mbit/s charges.

Figure A5.11: Comparison of trunk charges by bandwidth

A5.156 We consider that this pricing difference does not warrant intervention as the two services are based on different technologies. BT's response during the LLCC Appeal, "*DPCN technology does not utilise trunk. Direct comparison of transmission costs using different technologies was simply not possible*"[63].

[63] See paragraph 3.241 of the Competition Commission's Determination, 30 June 2010.

Terminating versus trunk charges for 2Mbit/s circuits

A5.157 On the 2Mbit/s charges, C&WW observed that trunk was 3.3% more expensive than 2Mbit/s terminating segments[64]. If the 2Mbit/s trunk price was being brought down to DSAC and 2Mbit/s terminating segments were below DSAC, then it was likely that terminating segments were more expensive than trunk. C&WW argued that this should be reflected in the pricing structure.

A5.158 We note that, since the LLCC 2009, PPC trunk charges and terminating segment charges have been charge controlled in the same basket. Table A5.14 below sets out the 2Mbit/s trunk and terminating segment charges over three periods between 2009 and 2012. It shows that, since 2009, terminating segment charges have increased while trunk segment charges have decreased. The result is that terminating charges are now more expensive on a per km basis than trunk. We consider that the changes in the charges of trunk and terminating segments indicate that BT has rebalanced its pricing structure since the beginning of the last charge control and that the current trunk and terminating segment charges are likely to broadly reflect the underlying costs of providing them.

Table A5.14: Comparison of 2Mbit/s charges between 2009 and 2012

Charge	1 October 2009	1 October 2011	1 August 2012
Terminating segment charge (per km per annum)	£45.34	£51.57	£56.57
Trunk segment charge (per km per annum)	£46.83	£42.61	£44.94

Source: BT Wholesale Carrier Price List

Comparison of 34/45Mbit/s and 140/155Mbit/s trunk charges

A5.159 C&WW's last observation was that the price of 45Mbit/s trunk was over twice the price of 155Mbit/s trunk. C&WW argued that from a technical perspective there was no reason why 34Mbit/s or 45Mbit/s circuit could not be routed over a 155Mbit/s bearer and therefore no reason why there should be such a price differential. C&WW pointed out that within the PPC product portfolio there is no product option for customers to route 45Mbit/s circuits over 155Mbit/s and that there was no obvious reason why the efficiently incurred costs of 45Mbit/s trunk should be greater than those for 155Mbit/s.

A5.160 Figure A5.11 above shows that the per kilometre charge for a 45Mbit/s circuit was just over twice the charge for a 155Mbit/s circuit in 2009 and that this margin has since reduced. In Ofcom's response to C&WW during the appeal, we noted that one reason for this is that the costs of trunk circuits are not geographically uniform in that they vary depending on location. This, in turn, may reflect the density of trunk circuits on particular routes. So if a higher proportion of 45Mbit/s circuits were in "high cost" areas or on low-density routes, the result might be that the average cost of 45Mbit/s trunk was higher than that of 155Mbit/s.

A5.161 In its assessment, the CC was not persuaded by C&WW's view that the pricing differential and that this would lead to inefficient and discriminatory pricing. In particular, the CC argued that that "*in an industry with large common costs, the*

[64] In 2009, the 2Mbit/s trunk charge was £46.83 per km, while the 2Mbit/s terminating charge was £45.34 per km.

'correct' cost of each product is very difficult to know", which was the basis of C&WW's argument.

We do not propose any start charge adjustments to TI services

A5.162 Based on our assessment of the current level of charges and the charging structure, we do not believe there is sufficient evidence to make one-off adjustments to BT Wholesale's current prices. As per the CC's findings, we do not believe that some of the pricing anomalies as put forward by C&WW "*were indeed anomalies*". For other areas, we believe that our current proposals provide BT with the flexibility to price on a cost-reflective basis, subject to the sub-caps. Indeed, the CC believed that this is "*a sensible division of powers… and reflected a considered judgement by Ofcom consonant with the purposes of the 2003 Act*".

Assessment of Openreach charges for Ethernet services

A5.163 As with TI services, we have also evaluated the case for any one-off adjustments to Ethernet services. Ethernet services above 1Gbit/s were not previously regulated, hence no DSACs or DLRICs are provided in the 2010/11 RFS. DSACs and DLRICs for WES and BES services up to 1Gbit/s, disaggregated by bandwidth, are available. EAD services are currently aggregated across bandwidths (10Mbit/s, 100Mbit/s and 1Gbit/s), as are EBD (100Mbit/s and 1Gbit/s).

Assessment of Openreach current charges

A5.164 Based on the 2010/11 RFS, there are no Ethernet charges that are outside the reported DSAC and DLRIC range. Given the volume increases, we expect unit costs to fall, leading to a similar trend for DSACs and DLRICs. Despite this, we do not expect charges to increase above our estimated DSACs in 2012/13. This is because current DSACs are around 150% to 300% of reported FACs. Unit costs would have to decline dramatically for current prices to be above this threshold. Similarly current prices are at least 10% above reported DLRICs. As DLRICs fall in line with the unit cost reductions there would be a growing gap between current prices and DLRIC. Based on this, we do not propose any one-off adjustments for Ethernet services at the start of the charge control.

Assessment of Openreach charging structure

A5.165 Within Ethernet services, the total price paid for a circuit increases, depending on the capacity of the circuit. This increase in price as capacity increases is sometimes referred to as the 'bandwidth gradient' in pricing. We set out below our consideration as to whether Openreach might have been in a position to produce such a bandwidth gradient with potentially anti-competitive effects.

<u>Ethernet service prices and costs by bandwidth</u>

A5.166 Table A5.15 below shows that the rental prices of basic WES, BES and EAD circuits increase as bandwidth increases. For example, the step increase in price between 10Mbit/s and 100Mbit/s is 8% for EAD, 12% for BES and 32% for WES. However, the step increase between 100Mbit/s and 1Gbit/s is substantially greater: more than 100% increase for all three services.

Table A5.15: Ethernet services rental charges as at 1 October 2011

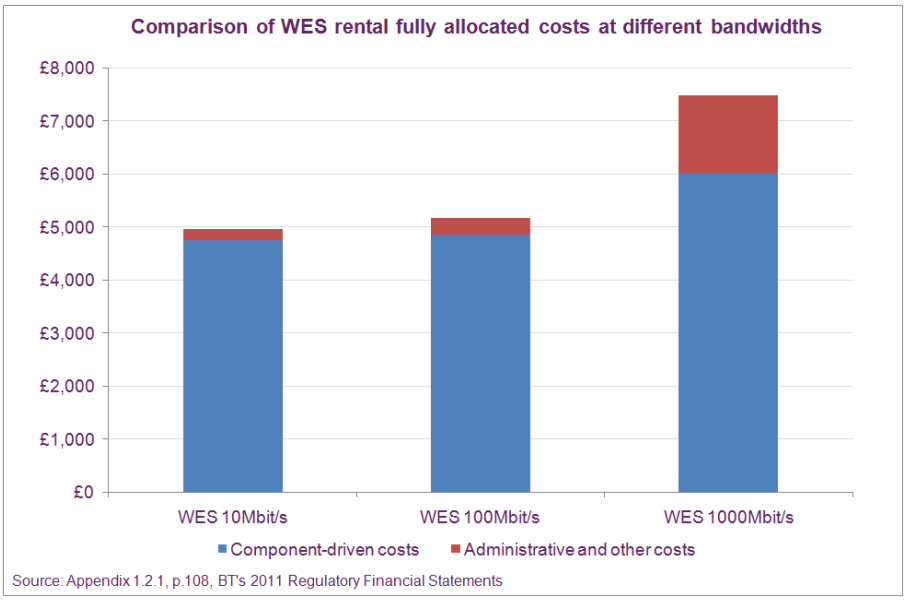
Service	Total price per circuit per annum	Average price per Mbit/s (£/circuit/annum)
WES		
10Mbit/s	3,217	321.72
100Mbit/s	4,235	42.35
1Gbit/s	10,000	10.00
2.5Gbit/s	[✂]	[✂]
10Gbit/s	[✂]	[✂]
BES		
10Mbit/s	3,110	311.00
100Mbit/s	3,476	34.76
1Gbit/s	7,529	7.53
2.5Gbit/s	[✂]	[✂]
10Gbit/s	[✂]	[✂]
EAD		
10Mbit/s	3,353	335.26
100Mbit/s	3,629	36.29
1Gbit/s	9,500	9.50

A5.167 However, although total prices increase with bandwidth, the increases are less than the corresponding increases in capacity for these circuits. Table A5.15 shows that for each circuit type, the average price per Mbit/s falls as bandwidth increases, i.e. customers benefit from lower average prices per Mbit/s as they purchase more bandwidth. For example, an EAD 1Gbit/s circuit costs £9.50 per Mbit/s compared to £335.26 per Mbit/s for the 10Mbit/s variant.

A5.168 We note that the bandwidth gradient in pricing is unlikely to be driven by differences in marginal costs.

A5.169 To illustrate this, we have considered the FAC profile of WES services up to 1Gbit/s. Figure A5.12 below shows that the FACs of WES rental services increase by only a small proportion as bandwidth increases. This suggests that there is little difference in the marginal costs of WES services across different bandwidths and is likely to reflect the fact that the technology and equipment used to deliver WES services are largely the same regardless of the bandwidth that is being provided. In the case of the WES services depicted below, the difference in FACs is mainly due to the fact that a higher proportion of admin-related costs (i.e. common costs) have been allocated to the higher bandwidth services.

Figure A5.12: WES rental fully allocated costs (FACs) in 2010/11



A5.170 It appears, however, that the bandwidth gradient in pricing is set with reference to the allocation of total costs across different services (i.e. the FAC allocation).

A5.171 For example, looking at Figure A5.12 and Table A5.15 indicates that based on current prices, the 10Mbit/s and 100Mbit/s circuits currently slightly under-recover FACs. The FACs show that there is little difference in the costs of providing the 10Mbit/s compared to the 100Mbit/s service, which is reflected in the smaller increase in prices between these bandwidths. Moving from 100Mbit/s to 1Gbit/s, however, there is a 45% increase in costs, also mirrored in the step increase in prices.

Incentives regarding the bandwidth gradient

A5.172 As the pricing gradient does not reflect differences in marginal costs, this suggests that Openreach earns a higher gross margin on high bandwidth circuits than on low bandwidth circuits. High bandwidth circuits therefore make a greater contribution to the recovery of fixed and common costs.

A5.173 We have examined whether Openreach could have an incentive to price the different bandwidth products in a discriminatory and/or anti-competitive way. Such an incentive could arise if the higher capacity circuits were purchased disproportionately by other CPs rather than BT itself. We note that the Openreach is required to set the same prices, use the same processes, to the same timescales to all their customers, internal or external. Table A5.16 below sets out the split of volumes of WES, BES and EAD circuits sold internally and externally.

Table A5.16: Ethernet internal rental volumes by customer type in 2010/11

Service	2010/11	2015/16
WES		
10Mbit/s	[✂]	[✂]
100Mbit/s	[✂]	[✂]
1Gbit/s	[✂]	[✂]
2.5Gbit/s	[✂]	[✂]
10Gbit/s	[✂]	[✂]
BES		
10Mbit/s	[✂]	[✂]
100Mbit/s	[✂]	[✂]
1Gbit/s	[✂]	[✂]
2.5Gbit/s	[✂]	[✂]
10Gbit/s	[✂]	[✂]
EAD		
10Mbit/s	[✂]	[✂]
100Mbit/s	[✂]	[✂]
1Gbit/s	[✂]	[✂]

Source: BT's 2011 RFS and Openreach response to S135 Notice of 4 April 2012[65].

A5.174 Table A5.16 shows that in 2010/11 the majority of WES and EAD circuits were purchased [✂] migration [✂].

A5.175 [✂]

A5.176 [✂]

A5.177 By the end of the charge control, most circuits are forecast to be EAD as a result of migration, particularly as new supply of WES and BES up to and including 1Gbit/s have been withdrawn since 31 May 2011. Therefore, Ofcom expects internal volumes to continue to make up a significant proportion of the overall total in 2015/16[66].

A5.178 Given the above assessment, we consider that Openreach will tend not have a strategic incentive to set higher prices for high capacity circuits (relative to lower bandwidth circuits) in order to comply with the charge control. That said, BES services are sold primarily to external customers and expected to continue to be the case over the course of the proposed charge control. As discussed in Section 6, although we consider that Openreach might have the incentive to earn a higher margin on BES services, we consider that it would not be appropriate in this case to place a specific sub-cap on BES services. This will allow Openreach the pricing flexibility to encourage customers to migrate from BES circuits to more modern and efficient services, such as EAD and EBD. We consider that the more general sub-

[65] Openreach response to S135 Notice of 4 April 2012
[66] See Openreach announcement at:
http://www.openreach.co.uk/orpg/home/updates/briefings/ethernetservicesbriefings/ethernetservicesbriefingsarticles/eth01711.do

cap that we are proposing to cover all charges (at RPI-RPI) will be sufficient to protect BES customers.

Bandwidth gradients and economic efficiency

A5.179 As noted above, with the exception of BES services, we have not found that Openreach has an incentive to recover more costs from purchases of high capacity circuits. Allowing for an upward-sloping bandwidth gradient (i.e. higher costs for more capacity) may be an efficient way to recover fixed and common costs, particularly when this is accompanied by decreasing average costs, as observed in Openreach's current charging structure in Table A5.15.

A5.180 The services that make up the Ethernet basket are characterised by high fixed and common costs and low marginal costs largely because much of the underlying network infrastructure that Openreach uses to deliver these services is common across different bandwidths and services. For example, all of these services use elements of the same assets like duct, fibre, equipment, while many location-related costs (e.g. accommodation or air-conditioning) and management systems are common across all bandwidths and services. This view was supported by the CC in the C&W appeal.

A5.181 Finally, since the demand for Ethernet services is changing rapidly over the next few years, this approach also allows Openreach the ability to re-optimise prices and respond to new patterns of demand quickly.

We do not propose any start charge adjustments to Ethernet services

A5.182 In the absence of competition concerns on the current level of prices and the pricing structure, we consider it appropriate to give Openreach the flexibility to determine the most appropriate structure of prices, subject to meeting the charge control conditions. This should allow Openreach to discover pricing outcomes which recover costs, (particularly fixed and common costs) in an efficient way. In addition, Openreach is likely to have much better knowledge of the way demand responds to price than Ofcom, and is able to respond to changes in demand and costs by changing relative prices far more quickly than Ofcom could. Having considered the evidence and the arguments put to us to date, we therefore do not propose any start charge adjustments to Ethernet services.

Cost forecasting approach

A5.183 The cost forecasts are split into two parts. The 'steady state' element is the forecast of what would happen to costs if there was no change in volumes during the charge control period. The 'additional' element is the change in cost induced by changing volumes. If volumes increase this will be positive, if volumes fall this will be negative.

A5.184 The steady state and additional elements are summed together to generate a total cost forecast.

A5.185 It is important to recognise that we are proposing an RPI – X charge control. Therefore, we forecast costs in real terms so that the value of X is unaffected by the assumed rate of inflation. Some values are forecast in nominal terms, and then converted into real terms, to capture price changes that diverge from the RPI.

A5.186 We forecast financial year-end costs and revenues. For calculating charge control year costs and revenues that begin in October and end in the following September, we take the average of our financial year-end forecasts.

A5.187 Table A5.17 below explains the terminology used in this section.

Table A5.17: Explanation of accounting terms

Name	Description
Gross Replacement Cost ('GRC')	The current cost accounting equivalent of Gross Book Value, i.e. the cost of BT replacing its assets now
Net Replacement Cost ('NRC')	The current cost accounting equivalent of Net Book Value, i.e. depreciated replacement cost of BT's assets
Operating capability maintenance ('OCM')	A Current Cost Accounting ('CCA') convention, where the depreciation charge to the profit and loss account relates to the current replacement cost of the firm's assets, taking account of specific and general price inflation.
Financial capital maintenance ('FCM')	A CCA accounting convention, where the depreciation charge to the profit and loss account includes holding gains or losses due to changes in asset prices, in addition to the OCM depreciation charge.
Mean capital employed ('MCE')	BT's definition of Mean Capital Employed is total assets less current liabilities, excluding corporate taxes and dividends payable, and provisions other than those for deferred taxation. The mean is computed from the start and end values for the period, except in the case of short-term investments and borrowings, where daily averages are used in their place.
Fully allocated costs ('FAC')	An accounting approach under which all the costs of the firm are distributed between its various services. The fully allocated costs of a service may therefore include some common costs that are not directly attributable to the service.
Inflation	The general change in prices across the economy. We have used RPI data obtained from the Office of National Statistics ('ONS')
Real asset price change ('APC')	Changes in valuation of underlying assets over and above general inflation.
WACC	BT's weighted average cost of capital.
Return on capital employed ('ROCE')	The ratio of accounting profit to capital employed. The measure of capital employed can be either HCA or CCA.
Asset lives	Asset lives of each component are calculated by dividing the GRC by the depreciation charge in the base year assuming straight line depreciation.

A5.188 Table A5.18 below sets out the abbreviations used in the cost forecasting calculations.

Table A5.18: Abbreviations used in cost forecasts

Abbreviation	Description
GRC(t)	The value of Gross Replacement Cost (GRC) in year t (taken as a year-end figure)
GRC(t-1)	The value of GRC previous year (taken as a year-end figure)
NRC (t)	Net Replacement Cost in year t
Capex (t)	Capital expenditure in year t
OCM dep (t)	Operating Capability Maintenance depreciation in year t
HGL (t)	Holding losses or gains in year t
NCA (t)	Net Current Assets in year t
eff	Percentage reduction in costs arising from efficiency gains

Forecasting of 'steady state' capital costs

A5.189 The 'steady state' element is the forecast of what would happen to costs if there was no change in volumes during the charge control period. Table A5.19 below presents the steady state calculations used by Ofcom's forecasting model.

Table A5.19: Approach to forecasting steady state capital costs

Calculation	Description
Gross Replacement Cost (GRC)	Base year GRC is taken from BT's response to our information request. Subsequent years are calculated as: GRC(t) = GRC(t-1) * [1 + APC(t)] + Steady state capex(t)
OCM depreciation (OCM dep)	Base year OCM depreciation is taken from BT's response to our information request and is the sum of HCA depreciation and CCA depreciation. In subsequent years we assume straight line depreciation, calculated as: OCM dep(t) = GRC(t) / asset life Where asset life in the base year is equal to GRC/OCM dep.
Capital expenditure (Capex)	Base year capital expenditure is assumed to be equal to OCM dep. Subsequent years are calculated as: Capex(t) = Capex(t-1) * [1 + APC(t)] * (1 – eff) Note that in both the TI and Ethernet baskets we have assumed 0% efficiency on capex.
Net replacement cost (NRC)	Base year NRC is taken from BT's response to our information request. Subsequent years are calculated as: NRC(t) = NRC(t-1) * [1 + APC (t)] + Steady state capex(t) – Steady state OCM dep(t)

Forecasting of 'additional' capital costs

A5.190 The 'additional' element is the change in cost induced by changing volumes of services relative to the steady state. If volumes increase this will be positive, if volumes fall this will be negative.

A5.191 Table A5.20 below presents the additional calculations used by Ofcom's forecasting model. All changes are forecast relative to the base year. As with the steady state capital and depreciation costs, additional costs are also forecast as year-end values.

Table A5.20: Approach to forecasting additional capital costs

Calculation	Description
Additional capex	Capex(t) = Total GRC(t-1) * [1 + APC(t)] * AVE * vol change %(t)
Additional GRC	GRC(t) = GRC(t-1) * [1 + APC(t)] + capex(t)
Additional OCM dep	OCM dep(t) = GRC(t) / asset life
Additional NRC	NRC(t) = Additional GRC(t) –OCM dep(t)

Forecasting of total capital costs

A5.192 Table A5.21 below presents the final set of calculations used by Ofcom's forecasting model in the capital cost category. In that Table, steady state values are prefixed by 'ss' and additional (volume driven) values are prefixed by 'ad'.

Table A5.21: Approach to forecasting total capital costs

Calculation	Description
Total GRC	Total GRC(t) = ss GRC(t) +ad GRC(t)
Real return on capital	Real return on capital(t) = [ss NRC(t) + ad NRC(t) + NCA(t)] * pre tax real WACC
Real deprecation	Real depreciation(t) = ss OCM dep(t) + ad OCM dep(t)
Real total holding loss	Real total holding loss(t) = -[ss NRC(t) + ad NRC(t)] * APC(t)
Real total capital and depreciation cost	Real total capital and dep cost(t) = Real return on capital(t) + Real depreciation(t) + Real total holding loss(t)
Real unit total capital and depreciation cost	Real unit total capital and dep cost(t) = Real total capital and dep cost(t) / Component volume (t)

Forecasting of total operating costs

A5.193 Table A5.22 below presents the operating cost calculations used by our forecasting model.

Table A5.22: Approach to forecasting operating costs

Calculation	Description
Pay	Base year pay is taken from BT's response to our information request. Subsequent years are calculated as: Pay(t) = Pay(t-1) *(1 – eff) *[1 + APC(t)] * [1 + volume change %(t) * CVE]
Non-pay	Base year non-pay is taken from BT's response to our information request. Subsequent years are calculated as: Non-pay(t) = Non-pay(t-1) * (1 – eff) * [1 + APC(t)] * [1 + volume change %(t)* CVE]
Real total operating expenditure	Real total opex(t) = [Pay(t) + Non-pay(t)]
Real unit total operating expenditure	Real unit total opex(t) = Real total opex(t) / Component volume (t)

Forecasting of service costs and the value of X

A5.194 We have calculated total component costs on a component-by-component basis as the sum of operating and capital costs. For a service that uses a number of different components, the total costs of service *y* is calculated using the following steps:

- Unit component costs(t) = Total component costs(t) / Component volumes(t);
- Unit service costs(t) = Matrix multiplication of Unit component costs(t) and Usage factor by service y for each of the components; and
- Total service costs(t) = Unit service costs(t) * Service volumes(t)

A5.195 Having selected the appropriate services to include in a basket the model then calculates total basket costs and total basket revenues:

- Total basket costs(t) = Sum of individual service costs(t); and
- Total basket revenues(t) in the absence of a charge control = Prices(0) * Service volumes(t), where Price(0) is the start charge for each service.

A5.196 To determine the value of X for each basket, the model compares the total costs and revenues in the last year of the charge control. Charge control year costs and revenues for any one year are calculated as the average of current and previous financial year costs and revenues. We solve the value of X for this basket such that the two are equal in the final year.

A5.197 The value of X is effectively the weighted average real annual price change for the services in the basket. That is, assuming that with the introduction of the charge control, the value of X is applied equally for all services within a basket, the value of X can be solved as:

$$X = (Costs_T / [Price_0 * VolumesT])^{1/3} - 1$$

Where:

$Costs_T$ = Forecast costs at the end of the charge control (2015/16)

$Price_0$ = Service prices at the start of the charge control (2012/13)

$Volumes_T$ = Service volumes at the end of the charge control

Key quantitative issues

A5.198 We discuss below how the model approaches a number of modelling challenges concerning:

- services disclosed in the regulatory accounts compared to those on the Openreach price list;
- usage factors and the conversion between component-level costs to service-level costs;
- calculation of administrative and other costs;
- reallocation of costs between TI and Ethernet baskets; and
- Ethernet basket migration credit.

Service prices

A5.199 We note that the rental volumes reported are all year average volumes[67] such that the average prices shown in the RFS reflect largely what is available on the BT Wholesale and Openreach[68] price lists. They may differ slightly due to both price

[67] Section 8.6, "A study of BT's Regulatory Financial Statements for business connectivity markets", 25 November 2008, Analysys Mason.
http://stakeholders.ofcom.org.uk/binaries/consultations/llcc/annexes/analysysmason.pdf
[68] BT Wholesale carrier price list is available at
https://www.btwholesale.com/pages/static/Library/Pricing_and_Contractual_Information/carrier_price_

changes during the year and volume changes. For connection volumes, they are reported as the total year volume due to the one-off nature of these charges.

A5.200 For the base year analysis shown in Table A5.3 and Table A5.5 the prices used are, in effect, the average revenues by service type reported by BT Wholesale and Openreach. Both parties provided us with their respective revenue reconciliation statements for the year 2010/11.

A5.201 As explained above, the start charges we use for the purposes of proposing the values of X for the TI and Ethernet baskets are from BT Wholesale and Openreach price lists. The remainder of this section describes in detail service products where this is not the case.

A5.202 We note that the figures in the RPI-X model are quoted in 2010/11 prices. Therefore, any service price we use for the start of the charge control in 2012/13 has to be rebased. We use the RPI inflation figures as reported by the Office of National Statistics ('ONS')[69] for this conversion.

Service prices for TI services

A5.203 For the PPC services the rental charges for each constituent of the circuit (i.e. local end, main link, distribution and trunk) is separately identified and charged. For those services we use BT Wholesale's charges as set out in its Carrier Price List ('CPL') B8.03, applicable from 1 August 2012. The connection charge for each circuit is also identified separately. The charges are set out in CPL B8.02 and apply from 1 October 2011 onwards.

Radio Base Station ('RBS') backhaul

A5.204 RBS backhaul service charges can be found in B11.02 for connection charges and B11.03 for rental charges. The charges have been effective from 1 December 2011 onwards, and to date, there are no announced changes to these charges.

Table A5.23: Published connection charges for new RBS backhaul circuits

Provision charge per circuit	Opening price	Single charge	Effective Date	Single charge	Effective Date
128Kbit/s – 960Kbit/s	£499.94	£550.43	1/11/10 – 30/11/11	£603.27	1/12/11
2Mbit/s	£1696.00	£1886.24	1/11/10 – 30/11/11	£2,045.40	1/12/11
2Mbit/s Subsequent (note 11)				£1050.00	01/06/07

Source: BT Group response to S135 Notice of 1 July 2011[70] and BT Wholesale carrier price list B11.02

A5.205 BT Wholesale noted that the published price in the RFS is slightly different to the average price calculation based on the prices in Table A5.23 because of the volume mix. BT Wholesale also noted that for the 2Mbit/s circuits, many of the volumes are from subsequent connections which are charged at £1050. We have estimated subsequent volumes to represent 72% of all volumes, based on a comparison of 2010/11 average price in the RFS to the average prices in the price list.

list/cpl_sectionb8partialprivatecircuits.htm. Openreach Ethernet service pricing is available at http://www.openreach.co.uk/orpg/home/products/pricing/loadPricing.do

[69] The dataset is available at http://www.ons.gov.uk/ons/datasets-and-tables/data-selector.html?dataset=mm23.

[70] BT Group response to S135 Notice of 1 July 2011

A5.206 For the purposes of the start charges, we propose to use £603.27 for the sub 2Mbit/s circuits and £1330.24[71] for the 2Mbit/s circuits.

A5.207 Although RBS Backhaul circuits use the same underlying inputs as PPCs (i.e. these circuits will have a certain number of links, local ends etc), the rental charges are simplified so that there is a simple charge based on bandwidth and distance. These are listed in B11.03 of the CPL. However, the volumes and costs are disaggregated into the individual constituents of the RBS circuit. For the purposes of comparing costs and revenues, BT Wholesale has matched rental revenues against the RBS main link services. Given this assumption, we will use this average revenue as the start charge for RBS main links.

A5.208 We note that BT Wholesale has increased RBS Backhaul rental charges as of 1 December 2011. Since the RFS average revenue was based on the previous charges, we have calculated the average percentage difference between the two sets of CPL charges and applied it to the 2010/11 average RFS revenue for our starting charge.

SiteConnect

A5.209 For SiteConnect BT Wholesale's price list (B12.01) shows that as of 1 June 2012, this service will no longer be available to new customers. This has been reflected in BT Wholesale's service volume forecasts. The connection charge is therefore not relevant for our analysis.

A5.210 As with RBS backhaul, SiteConnect charges are based on bandwidth and distance only, even though it also uses the same underlying components as PPCs. The revenues have also been matched against the main link part of the SiteConnect service. We will continue to use the average revenue as the start charges since these have not changed since 2 March 2007.

Netstream 16 Longline

A5.211 Netstream 16 Longline is a special option of the Netstream service. It is used by mobile operators for connections between small satellite sites and major sites and is available for 2Mbit/s. As with SiteConnect services, we use the average revenue as the start charge for Netstream 16 Longline services.

Service prices for Ethernet services

A5.212 Openreach also provided us with the reconciliation statement for the 2010/11 financial year. The information provided is in greater detail than is available in the RFS, as shown in the examples below:

[71] £1330.24 = 28% * £2045.40 + 72% * £1050.00.

Table A5.24: Level of aggregation in the RFS

Aggregation within service bandwidth categories	Aggregation across bandwidths	Aggregation across services
"Wholesale extension services ('WES') 10Mbit/s rental" includes:	"WES other bandwidths rental" includes:	"Other Ethernet rentals" includes:
WES 10Mbit/s Local reach	WES 2Mbit/s	Street access
WES 10Mbit/s Local access managed	WES 155Mbit/s	Broadcast access
WES 10Mbit/s	WES 622Mbit/s	Optical spectrum services
WES 10Mbit/s Managed	WES Aggregation ML VLAN	Bulk Transport Link ('BTL')
WES Aggregation 10Mbit/s Access	WES Aggregation ML RJ45	Cablelink
	Ethernet resilience option 2	Openreach Network Backhaul Services ('ONBS')
		ONBS resilience option 2

Source: BT Group response to S135 Notice of 1 July 2011[72]

A5.213 As with the BT Wholesale submissions, the average prices in the RFS differ to those in the price list due to price and volume changes during the year. For the purposes of reconciliation of base year revenues with those in the RFS, we have used the average revenues as submitted by Openreach.

A5.214 For the start charges, Openreach has provided us with detailed volume forecasts prior to the aggregation shown in the RFS. They have also provided us with the corresponding prices (including the 'Terms on Application' charges for the above 1Gbit/s services) for each of the products. These are the ones we have used as the start charges.

Ethernet Backhaul Direct ('EBD')

A5.215 EBD services are available at 1Gbit/s or 10Gbit/s and the pricing is distance independent. Instead, the rental charges differ by band:

Table A5.25: Ethernet Backhaul Direct ('EBD') rental charges (£ excluding VAT)

Feature	Band A	Band B	Band C	Weighted average
1Gbit/s	7,782	9,227	13,450	7,981.49
1Gbit/s Extended reach	9,150	17,009	21,232	15,763.49
10Gbit/s	[✂]	[✂]	[✂]	[✂]
10Gbit/s Extended reach	[✂]	[✂]	[✂]	[✂]

Source: Openreach price list, Openreach response to S135 Notice of 4 April 2012[73]

A5.216 The EBD volumes provided are not split by band. We have obtained information from the BCMR Consultation analysis that suggests that the majority of the circuits are in Band A. We have used the split between the different bands to arrive at a weighted average price as our start charge for EBD services.

[72] BT Group response to S135 Notice of 1 July 2011
[73] Openreach response to S135 Notice of 4 April 2012

Discounts

A5.217 In the base year revenue reconciliation analysis Openreach submitted[74], they showed minimum term and Metro offer discounts that have been applied to some services. Whilst we do not allow such discounts to count towards the compliance of the charge control, we believe it is necessary to take these into account when calculating revenues at the end of the charge control. To exclude such discounts could result in an under-recovery of costs at the end of the charge control. This is particularly the case where the discounts are minimum term discounts and the reduced prices would therefore persist during the charge control.

A5.218 We have calculated the total revenue adjustment through discounts as a proportion of total undiscounted revenues for those services in the Ethernet basket. Total discounts amount to less than 2% of revenues. We have applied this to the start charges.

Usage factors

A5.219 In our assessment of costs, we have taken into account what BT has reported in its RFS, including information on the network activity statement and the calculation of FAC based on component costs and usage factors statement and reconciliation statements.

A5.220 Usage factors take account of how often a component is used in the provision of TI and Ethernet services. Costs allocated to each service are calculated by multiplying the usage factors by the amount applied to relevant components. It incorporates BT's cost allocation methodologies as set out in its Detailed Attribution Methods ('DAM')[75]. We have identified the following two main types of costs[76].

- Network component costs - the calculation of the cost of service provision is more complicated, as each service represents the utilisation of one or more network components, and its cost is therefore determined by an attribution of component costs.

- Administrative and other costs - typically these are costs that are allocated on a top-down basis, for example, on a pro rata basis using full-time equivalents ('FTE'). Component costs are allocated onwards to services bases on volumes x usage factors for each product.

A5.221 We received data from BT in the form of service-level costs, split by component. We also received from BT the matrix of usage factors that allow us to convert from unit component costs to unit service cost for the network component costs. We have used the same set of usage factors in order to convert the service volume forecasts provided by BT into corresponding component volumes. In turn, these component volumes are used to forecast total component costs in conjunction with other assumptions such as AVEs and CVEs. Usage factors are therefore an important part of the steps involved in our forecasting methodology. To check this, we have

[74] Openreach response to S135 Notice of 25 May 2012

[75] http://www.btplc.com/Thegroup/RegulatoryandPublicaffairs/Financialstatements/2011/DetailedAttributionMethods2011.pdf

[76] See Appendix 1.2 of BT's RFS 2011: http://www.btplc.com/Thegroup/RegulatoryandPublicaffairs/Financialstatements/2011/CurrentCostFinancialStatements2011.pdf

sought to ensure that our base year costs and revenues can reconcile to the RFS at a market level.

A5.222 In this section, we summarise our review the data received from BT Wholesale and Openreach relevant for the calculation of the network component costs.

Usage factors for TI services

A5.223 BT Wholesale provided usage factors in greater detail than is available in Appendix 1.2 of the RFS, for example, usage factors for 2Mbit/s local end for CLZ and non-CLZ areas separately. The final figures submitted by BT Wholesale ensured that:

- component volumes, calculated as service volumes multiplied by usage factors, reconciled to those in the Network Activity Statement (Appendix 1.1 of the RFS) for the main TI-specific components; and

- unit component costs, calculated as total component costs divided by component volumes, also reconciled to those in the Network Activity Statement.

A5.224 The total network component costs account for over 80% of the total costs for TISBO and TI trunk market as a whole. The reconciliation exercise described above generates costs that are within 1% of the reported figures.

A5.225 For components that are also used by other wholesale markets, such as D side and E side copper, the component volumes and costs submitted only relate to those in the wholesale leased line markets. As a result, the unit component costs are between 0% and 15% higher than those reported in the RFS, resulting in total costs for these components that are around 8% higher. However, these components account for less than 2% as a proportion of total TISBO and trunk market costs. As such, we believe no further benefit can be gained by requesting additional information to allow for a more accurate reconciliation.

Usage factors for Ethernet services

A5.226 There are eight main components that are used by Ethernet services. These are sometimes also known as “super components”, which are made up of more detailed “cost components”[77]. The usage factors based on super components are an average of the usage factors based on the underlying components. Although it could be viewed as more precise to use usage factors based on the underlying components, our understanding of these cost components is that to generate usage factors that allowed reconciliation with the RFS we require would be a time consuming exercise. Furthermore, it would also mean that we would add another dimension of disaggregation for modelling at cost component level, to subsequently aggregate at super component level, and then use these to calculate service-level costs. We have accepted Openreach’s views on this and modelled costs on a super component level.

A5.227 Openreach provided us with different sets of usage factors. In particular, Openreach’s reconciliation exercise provided on 2 April allowed the service volumes to be reconciled to the RFS.

[77] For example, the “Wholesale & LAN extension services fibre etc” super component includes what used to be defined as “Wholesale & LAN extension services fibre etc” as well as “Ethernet Access Direct electronics”, “Ethernet Access Direct fibre”, “Ethernet Access Direct Rental”, “Other Ethernet Rental” etc.

- Both the WES and BES component volumes included the above 1Gbit/s services. However, the RFS costs and revenues do not include above 1Gbit/s services. So if we were to use these usage factors to determine unit component costs, we would have to include the above 1Gbit/s costs.

- WES component volumes were only made up of WES services, despite the capital cost and operating breakdown for EAD services showing that costs were allocated to this super component. Using this directly in our model would result in unit WES component costs being attributed to WES services and none to EAD services.

- BES component volumes were only made up of external BES volumes. Since we include internal BES volumes in our analysis, this would over-estimate total BES components and under-estimate total BES component costs and BES service costs.

A5.228 In order to address the issues above, we have adopted the approach set out below.

- Since Openreach's reconciliation provides information on the usage factors for above 1Gbit/s services, this is what we use in the model for estimating the costs of WES and BES above 1Gbit/s services.

- Base the usage factors from Appendix 1.2 of the RFS, titled "Calculation of FAC based on component costs and usage factors". To do this, we divided the unit component costs allocated to each service by the respective unit component costs from Annex 15. For example, the usage factor for a WES 10Mbit/s rental service would be £337.69[78] divided by £381.37, or 0.885. This ensured that, at the minimum, EAD service costs could be obtained from the cost forecasts carried out at component level. It also ensured that the costs we use are consistent with those in the RFS.

- Whereas we include both internal and external BES circuits in our assessment of the Ethernet basket, the unit BES component costs were derived using external BES volumes only. As a result, we have added costs associated with these additional volumes in line with the internal BES unit costs.

A5.229 Based on the reported figures, total network component costs account for around 80% of the total costs for the AI market (i.e. up to and including 1Gbit/s). Using a combination of the usage factors from the RFS and our base year adjustments, our costs in 2010/11 are within 2% of those reported in the RFS. Although we recognise there may be benefits in terms of accuracy for modelling at the more detailed cost component level, we believe that it would be disproportionate in term of the time and effort required. We believe our approach is a balanced trade-off between reconciliation and detail, and that this is an appropriate starting point for our analysis. We therefore propose to use the usage factors derived from the RFS.

Ethernet basket migration credit

A5.230 During the course of the proposed charge control period, customers are forecast to migrate from legacy to new Ethernet circuits[79]. Openreach has already withdrawn

[78] See p108 of BT's 2011 RFS.
[79] By legacy Ethernet, we mean services such as WES, WEES and BES. By new Ethernet we mean services such as EAD, EBD and BTL.

certain bandwidths of WES/WEES and BES circuits from new supply[80] and is encouraging existing purchasers of legacy Ethernet circuits to migrate to the new Ethernet products[81].

A5.231 In Section 6, we have explained that the adoption of the MEA approach needs to be consistent with the expectation that an efficient operator should expect to recover its costs. We have also explained that it may not be possible for even an efficient operator to move seamlessly from one MEA to another, as there may be transition costs in migrating customers from one service to another.

A5.232 We note that the legacy Ethernet services have higher operating costs than the new Ethernet services. In order to migrate customers to the new Ethernet service, and so benefit from these lower costs, upfront costs need to be incurred. The MEA approach we are proposing to adopt does not take into account the transition costs in migrating from legacy to new Ethernet services. This poses a risk that even an efficient operator may not be able to seamlessly adopt the MEA at all points in time.

A5.233 We consider that an appropriate measure of the costs of migrating customers on legacy Ethernet services to new Ethernet services is the underlying cost of connecting these customers to the MEA services (EAD and EBD). We have therefore calculated the migration credit that will be allowed to Openreach on the basis of the unit costs of EAD/EBD connections and the volume of customers renting WES, WEES, and BES services that will need to be migrated.

A5.234 Openreach submitted calculations of the migration costs associated with the transition to EAD and EBD. Openreach stated that it expects that it will need to offer customers on legacy Ethernet services large discounts on EAD/EBD connections from the start of the charge control. Openreach calculated the discounts which it would need to offer, and provided an estimate of the migration costs, based on the revenue which it would forego through such discounts.

A5.235 We consider that the true migration costs should be based on the underlying migration costs, rather than on a foregone revenue approach. We have therefore rejected Openreach's methodology and adopted an approach based on the underlying transition costs.

A5.236 We have carried out the following steps to calculate the migration credit.

- Each of the WES, WEES and BES services that will need to be migrated to new Ethernet services were assigned a corresponding MEA service (i.e. an EAD/EBD service of the same / similar bandwidth).

- The forecasted rental volumes of the relevant WES, WEES and BES services at the beginning of the charge control were multiplied by the forecasted unit connection costs of the corresponding MEA services at the beginning of the charge control.

[80] Openreach announcement of 31 January 2011, available at: https://www.openreach.co.uk/orpg/home/updates/briefings/ethernetservicesbriefings/ethernetservicesbriefingsarticles/eth00411.do

[81] For example, Openreach has offered reductions on EAD connection fees for CPs migrating from legacy Ethernet products. See: http://www.openreach.co.uk/orpg/home/updates/briefings/ethernetservicesbriefings/ethernetservicesbriefingsarticles/eth00912.do

A5.237 Using this methodology, we have calculated that the migration credit we propose to allow will be approximately £43m. In our cost forecasting, we propose to take the migration credit into account by assuming that legacy Ethernet customers migrate evenly over the course of the charge control. As a result, the migration credit will be applied by subtracting our estimate to the forecasted revenues at the end of the charge control in 2015/16.

Administrative and other costs

A5.238 BT has a number of administrative cost components that do not have associated volumes and are shown in the table below. Usage factors for these components represent the proportion of total admin costs attributed to a particular service. Without volumes we cannot use the AVE/CVE relationship to forecast how such costs change in the future. For some components all the costs are allocated across the leased lines markets, whilst others are spread across other regulated wholesale markets as well as unregulated markets.

Table A5.26: Administrative and other costs in 2010/11

Cost component	Total costs allocated to all markets (£m)	Total costs allocated to PPCs (£m)	Total costs allocated to Ethernet services up to 1Gbit/s (£m)
Edge Ethernet ports	18	4	0
Core/Metro connectivity	119	27	0
MSAN-Metro connectivity link	41	4	35
Service centres - assurance	50	0	6
Sales product management	24	0	6
Service centres – provision	98	0	38
SG&A other access	82	0	0
DSLAM capital/maintenance	307	0	0
SG&A partial private circuits	48	44	0
SG&A private circuits	20	19	0
Netstream equipment	8	8	0
PPC support services	6	5	0

Source: Appendix 1.3.1 of BT's 2011 Regulatory Financial Statements.

A5.239 Both BT Wholesale and Openreach have provided detailed allocations for each of these components to the individual services. We propose to use this as the base year data. This avoids the need for multiplying these components with their respective usage factors.

A5.240 The approach adopted in LLCC 2009 for forecasting such costs is based on calculating AVEs and CVEs for the relevant components based on their GRC weightings, and then forecasting these costs according to service volume (rather than component volume) changes.

A5.241 We do not believe this approach is appropriate for this charge control. The implied AVEs and CVEs are between 0.2 and 0.5. With the dramatic changes in volumes, this implies significant changes in the unit costs at the service level, and, as volumes increase substantially; total admin costs are also forecast to increase very significantly, at a rate which implies a cost volume relationship well above the weighted average CVE in the base year. Since these costs are allocated on a top-

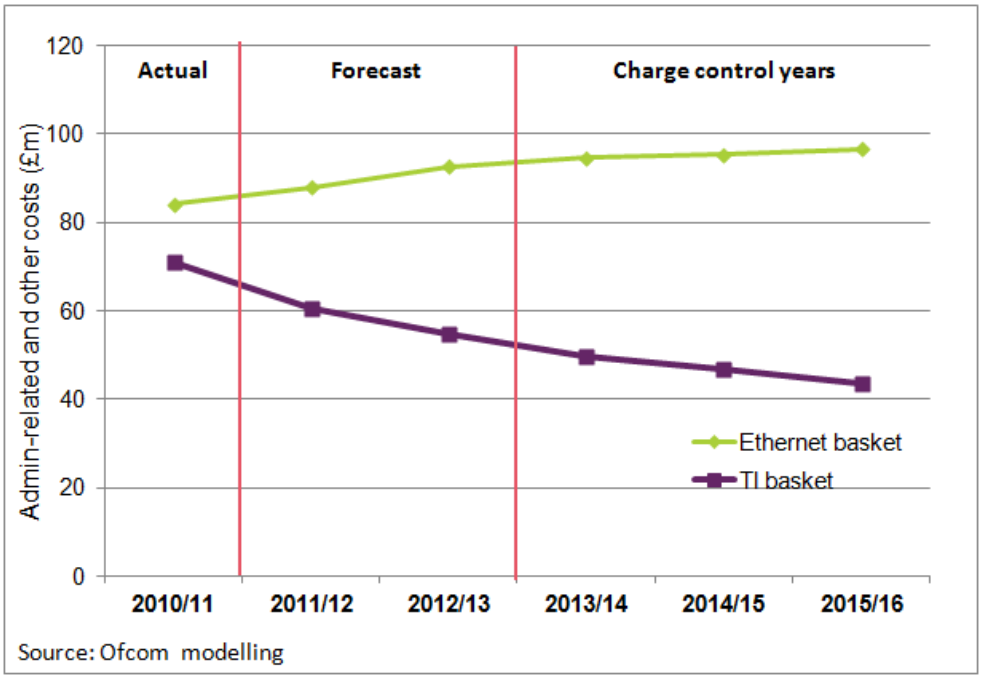
down basis, we believe that as volumes increase they would attract a higher allocation of these costs, and the same would apply when volumes decline. The AVEs and CVEs by service in the base year are in effect a snapshot based on current allocation methodologies.

A5.242 We propose a modified approach whereby we aggregate these types of costs at the basket level (rather than at service level), and forecast them according to the total number of circuits in the basket. This results changes in unit service costs which are more consistent with the expected change in admin costs.

$\text{Admin-cost}_t = \text{Admin-cost}_{t-1} * (\%\ \text{change circuit volumes in basket}_t * \text{CVE} + 1) * (1 - \text{efficiency})$

A5.243 For the purposes of the admin cost forecasts we propose to use a CVE of 0.40, which is consistent with the overall weighted average pay and non-pay CVEs, adjusted to be consistent with our approach to adjusting overhead CVEs more generally by 10%. We note that this formulation is consistent with our general approach to forecasting operating costs.

Figure A5.13: Ofcom's forecasts of admin-related and other costs



A5.244 Figure A5.13 above shows total admin-related and other costs allocated to TI and Ethernet baskets in 2010/11. The forecasts are based on the CVE assumptions and the number of circuits in each of the baskets.

Reallocation of costs between TI and Ethernet baskets

A5.245 Volumes and revenues are expected to migrate significantly from TI services to Ethernet services over the charge control. The number of Ethernet circuits is expected to grow by over 20% a year, while number of TI circuits is expected to fall

by around 25% per annum. These changes will largely offset each other, so that the overall impact on leased line revenues is relatively modest[82].

A5.246 Many of the costs required to deliver TI and Ethernet services are common. For example, assets (such as duct, land and buildings) as well as operational and administration costs are used to support leased lines across the two markets. Consequently, many of the same costs incurred in supporting the SDH networks in place at the beginning of the period will still be incurred in operating the 21CN/WDM infrastructure we expect to be in place by the end of the charge control period.

A5.247 Cost components are defined in BT's system such that TI and Ethernet services do not share the same underlying cost components, even though these components use the same underlying assets. So, if TI volumes fall by 75%, the unit cost of the duct allocated to TI at the start of the period would increase significantly, to reflect the fact that fixed costs would then only be allocated over a quarter of the original volumes. Conversely, if Ethernet volumes rise by 50% the unit cost allocated to Ethernet would fall significantly. We consider that this is not an accurate prediction of the true cost evolution as we would expect BT to allocate costs to reflect the changing use of the assets, As a result, there is a need to explicitly reallocate some costs between the TI and Ethernet baskets.

A5.248 In this section we discuss our proposals for reallocating capital and operating costs.

We propose to analyse capital costs and operating costs separately

A5.249 The cost categories used in BT's accounts can be divided into operating costs and capital costs. Operating costs relate to the ongoing costs of providing the services in question. Capital costs include depreciation, holding gains and losses and return on capital employed, and relate to the recovery of the sunk costs of the underlying assets used.

A5.250 For TI services, capital costs can be divided into costs for TI-specific assets and costs for common assets which are used to provide other services in addition to TI services. By the end of the charge control period, virtually all of the TI-specific assets will be almost or fully depreciated. The rise in unit capital costs is thus mainly attributable to common cost allocation.

A5.251 As shown in Table A5.27 below, the largest share of the common capital costs relate to costs for fibre and duct. Unlike TI-specific assets, these assets are common to other services. These costs are allocated by BT to services in relation to their usage to provide those services. As one service declines, and another increases, the growing service will attract an increasing allocation of these common costs.

[82] Across the two markets, there will be a net decline in the number of circuits primarily due to the large volume of low bandwidth TI services not offset by growing Ethernet services. Before the impact of Ofcom's regulation, we expect that the total revenue from leased lines markets would change by less than 5% per annum across the two markets.

Table A5.27: Breakdown of capital costs by asset type in 2010/11, TI market

	Average asset life	NRC/GRC ratio	Depreciation	Mean capital employed
Cable	[✂]	[✂]	[✂]	[✂]
Duct	[✂]	[✂]	[✂]	[✂]
Transmission	[✂]	[✂]	[✂]	[✂]
Local Exchange	[✂]	[✂]	[✂]	[✂]
Land & Buildings	[✂]	[✂]	[✂]	[✂]
Computers & OM	[✂]	[✂]	[✂]	[✂]
Other network equipment	[✂]	[✂]	[✂]	[✂]
Other	[✂]	[✂]	[✂]	[✂]
Motor Transport	[✂]	[✂]	[✂]	[✂]
Intangibles	[✂]	[✂]	[✂]	[✂]
Total	[✂]	[✂]	[✂]	[✂]

Source: BT Wholesale response to S135 Notice of 21 May 2012[83].

A5.252 Table A5.27 also shows that for transmission, computers and network equipment, the assets are low in 2010/11, and they will become nearly or fully depreciated by the end of the charge control period. As a result, the majority of capital costs in 2015/16 will be made up of cable, duct and land and buildings.

A5.253 On the other hand, operating costs are split into two broad categories- pay and non-pay costs. These include direct costs that relate specifically to the delivery of the services in question, such as general support and maintenance, as well as fixed and common costs such as finance, billing, general management, personnel and administration. We do not have the detailed breakdowns of costs into these cost types.

Table A5.28: Breakdown of operating costs by cost type in 2010/11, TI market

	Operating costs
Pay	47%
Non-pay	53%
Total	100%

Source: BT Wholesale response to S135 Notice of 21 May 2012

A5.254 In the LLCC 2009, we addressed the issue through reallocation of some shared costs from the declining services to the growing services. We reallocated around £150m from the TI basket to the AI basket. We now propose make a similar adjustment for this charge control, with a modified approach to reallocating capital costs. We set out below our approach for capital and operating costs in turn.

We propose to maintain a constant unit capital cost for TI services in respect of their use of shared assets

A5.255 Capital cost forecasts are based on the combination of volume changes and AVEs, as set out in Table A5.21. As discussed above, this approach does not take into account migration from one service to another.

[83] BT Wholesale response to S135 Notice of 21 May 2012

A5.256 The LRIC model AVE for duct is 0.08. This AVE means that if the number of circuits falls by 10%, duct costs would fall only by 0.8%. This AVE is calculated on the assumption that all other services which use duct are provided at current levels. Whilst these AVEs may be appropriate for gradual, incremental changes in the underlying services, they may not accurately reflect movements in costs associated with migration from one service to another.

A5.257 The impact of this migration can be seen by considering the movements in unit duct costs for TI and Ethernet services implied by the AVE of 0.08.

- Our forecasts show that TI component volumes fall by 70% over the charge control period. However, the AVE of 0.08 implies that the total duct cost allocated to TI will fall by just 5.6%[84]. As this duct cost is spread over a significantly reduced volume, this will result in a significant increase in duct costs allocated to the remaining TI circuits.

- We expect Ethernet circuits to increase by over 80% by the end of the charge control period. The AVE of 0.08 implies that total duct costs allocated to Ethernet would only increase by 6.4%. This will result in a significant reduction in per unit duct costs allocated to Ethernet services.

A5.258 In practice, we do not believe unit costs would change in this way. Over the period, we expect BT to reallocate common costs to reflect the changing use of that network. This will mean that BT will allocate fewer costs to declining services, and more to growing services. Specifically, the share of total costs allocated to TI will fall to reflect the lower use of the network by TI circuits, and the share of costs allocated to Ethernet services to rise.

A5.259 For capital costs, we consider duct, land and buildings and cable are assets that are common between TI and Ethernet services. We expect that TI services would attract a decreasing allocation of these costs as TI volumes decline, whereas Ethernet services would attract an increasing allocation. For these asset types we propose to hold the unit costs allocated to TI services constant at 2010/11 levels over our forecast period.

A5.260 We calculate the amount of capital costs to be reallocated as follows set out below.

i. Calculate what the total capital costs would be using the AVEs. This is determined by the volume forecasts in conjunction with the AVEs, asset price changes and WACC. Across the TI services, this would imply a threefold increase in unit capital costs compared to 2010/11 levels.

ii. Calculate what the total capital costs would be assuming constant 2010/11 unit capital costs for the identified assets (i.e. duct, cable, and land and buildings) and the AVEs for the remaining asset types.

iii. The difference between i and ii is the amount of costs to reallocate.

A5.261 Table A5.29 below summarises the outcome of this calculation.

[84] The 5.6% is calculated as 0.08 multiplied by 70%.

Table A5.29: Approach to reallocation of capital costs from TI to Ethernet basket

Description of approach	Capital costs	Comments
Total capital costs in 2015/16 in TI basket	£149m	This is 49% of total costs. Of £149m, £14m are categorised as admin-related.
Costs associated with cable, duct and land & buildings in 2015/16	£75m	This accounts for 55% of total capital costs in 2015/16 prior to the reallocation. The remainder of capital costs relate to other types of assets, such as transmission, network equipment and other assets.
Total capital costs for cable, duct and land & buildings in 2015/16 calculated as: Unit capital costs in 2010/11 * Service volumes in 2015/16	£29m	This is what total capital costs would be if we assume unit cost recovery at 2010/11 levels in real terms.
Reallocation to Ethernet basket	**£46m**	Shortfall in the recovery of cable, duct and land & building costs are reallocated to the Ethernet basket.

We propose to allocate a proportion of non-marginal operating costs

A5.262 For operating costs, we do not have a detailed breakdown of the different cost types and we therefore cannot use a similar approach to capital costs. Instead, operating costs are split by pay and non-pay. We propose a similar approach as set out in the LLCC 2009[85] in determining the amount of operating costs to reallocate.

A5.263 The LLCC 2009 outlined different approaches to reallocating fixed and common costs. These are summarised in Table A5.30.

Table A5.30: Common approaches to cost allocation

Method	Description	Applicable to LLCC?
Equi-proportional mark-up	Common costs attributed in proportion to direct and indirectly attributable cost of the service.	Yes. Can attribute non-marginal costs relative to marginal costs of the TI and Ethernet services.
Relative outputs	Common costs attributed in proportion to their share of total output.	Yes, by looking at changes in TI and Ethernet service volumes.
Revenue method	Common costs attributed in proportion of share of total revenue.	No, because cost allocation method is used to determine prices, which in turn determines revenues.
Activity-based costing	Common costs allocated based on activities undertaken to provide service.	No, because underlying cost components are not common across TI and Ethernet services.
Ramsey approach	Common costs allocated on basis of relative demand elasticities.	No, because of the burden of information required to estimate demand elasticities.

Source: "Annex I: Background to cost allocation", Office of Fair Trading, 2006.
http://www.oft.gov.uk/OFTwork/markets-work/public-information

A5.264 Table A5.30 shows that of the five different approaches outlined, two – 'the Equi-proportional mark-up' and 'the Relative Output' – are applicable to our charge

[85] See paragraphs A7.179 to A7.193 of the LLCC 2009 Statement.

control. Both of these approaches require the calculation of the proportion of marginal costs in total costs.

A5.265 The equi-proportional mark-up approach requires the calculation marginal costs for both the TI and Ethernet services in order to determine relative marginal costs. This involves a number of iterative steps that requires the conversion of marginal component costs to service costs to determine to relative costs, applying this percentage the non-marginal component costs, and then converting this to service costs.

A5.266 The relative output method is more straightforward to apply. This takes the non-marginal costs and reallocates these costs based on changes in relative output. We consider that the most appropriate proportion of costs is given by the change in TI circuit volumes relative to our base year. This is the approach we adopted in the LLCC 2009 and we propose to adopt this for operating costs in our new charge control. We have therefore followed these steps.

- We have calculated total operating costs to be recovered based on the volume forecasts, CVEs and efficiency based on the formulae set out in Table A5.22.

- As with the LLCC 2009 approach, we have calculated the proportion of these operating costs that are 'non-marginal', i.e. fixed with respect to volume changes. This is done by multiplying the operating cost forecasts for each component with their respective CVEs. For example, if a component has a CVE of 0.6, this implies that 40% of costs (i.e. 1-0.6) are non-marginal.

- Of the non-marginal costs, we have allocated a proportion in line with the decline in TI services. This proportion is based on the reduction of TI circuits in 2015/16 compared to its 2010/11 levels, i.e. 74%. We have assumed that these non-marginal, or fixed, costs do not vary with volume and in practice these costs would be allocated on a top-down basis as the underlying volumes change. The total amount of non-marginal operating costs that we reallocate to the Ethernet basket is £55m.

A5.267 Table A5.31 below sets out the steps we describe above in reaching our proposed adjustment.

Table A5.31: Approach to reallocation of operating costs from TI to Ethernet basket

Description	Operating costs	Comments
Total pay operating costs in 2015/16	£157m	This is 51% of total costs in the TI basket. Of this amount, £31m are admin-related and other costs.
Recover all marginal costs in 2015/16	£53m	This is calculated as: Pay operating costs * Pay CVE + Non-pay operating costs * Non-pay CVE
Non-marginal operating costs in 2015/16	£74m	This is calculated as: Pay operating costs * (1 – Pay CVE) + Non-pay operating costs * (1 – Non-pay CVE)
Reduction in TI circuits from 2010/11 levels	74%	
Recover 26.5% of non-marginal operating costs from TI basket	£19m	This is calculated as: 26% * £74m Non-marginal operating costs
Reallocation to Ethernet basket	**£55m**	Difference between all non-marginal operating costs and non-marginal operating costs recovered through TI basket.

We propose to reallocate £101m in total to the Ethernet basket

A5.268 We therefore propose a reallocation from TI to Ethernet of £101m (i.e. £46m of capital costs and £55m of operating costs). This reallocation reduces the proposed charge control for TI from RPI+18.75% to RPI+3.25%. This impact is offset by a change in the proposed charge control for Ethernet basket from RPI – 17.50% to RPI – 12.00%. There is a neutral impact on BT's total revenues.

Results of our modelling

A5.269 From the information above the model produces cost forecasts for each service for each year. These are compared against the service revenues, and the values of X are then calculated so that in the final year forecast revenues and costs are equal.

A5.270 Sections 5 and 6 sets out our proposed approach to the charge controls, and the our view as to the indicative sensitivities to the base case. Based on this analysis, we propose the following ranges:

- for the TI basket, a base case of RPI+3.25%, based on a range of RPI+0% and RPI+6.5%; and
- for the Ethernet basket, a base case of RPI-12.00%, based on a range of RPI-8.00% and RPI-16.00%.

Question 11: Do you agree with our approach to cost forecast modelling? If not, please explain why and propose an alternative approach with supporting information.

Question 12: Do you agree with our assumptions of key inputs? If not, please explain why and propose an alternative approach with supporting information.

Annex 6

PPC Points of Handover

Introduction

A6.1 As explained in Section 5, POH are, in essence, high capacity links provided by BT, which connect an operator's network with BT's network. POH are therefore an essential component to enable infrastructure-based competition.

A6.2 Following the ruling by the CAT disposing the appeal brought by C&WW in respect of the LLCC 2009 Statement (the 'LLCC Appeal'), we set some of the PPC POH charges to LRIC to deal with the issues remitted back to us[86]. For the purpose of our charge control proposals set out in this consultation, we have considered various options for setting the charges for all PPC POH services, including those that did not form part of either the LLCC Appeal or our POH Statement.

A6.3 In Section 5, we have set out our proposals on the basket structure and level of controls for POH charges. In this Annex, we supplement those proposals by:

- providing background information including POH key characteristics;
- summarising the main points from the LLCC Appeal; and
- discussing the relevant options for regulating POH charges.

Summary

A6.4 We have considered whether we should set PPC POH at LRIC as well as whether we should consider making any starting charge adjustment.

A6.5 Given that the POH Statement published in September 2011 set some of the PPC POH charges to LRIC, our view is that these charges are already set at an efficient level. We therefore propose no starting charge adjustments to the services covered by the POH Statement.

A6.6 For the PPC POH charges that were not part of the recent POH Statement, we also propose no starting charge adjustments for the following reasons.

- With TI services in decline, the expected volumes of new connections are small and so is the corresponding revenue. We therefore do not propose bottom-up modelling of these charges.
- Our analysis of the rental charges not covered by the POH Statement (Type I rental) shows that they are generally consistent with the LRIC estimates. As such, we do not consider it appropriate to have any starting charge adjustments.

A6.7 As explained in Section 5, we propose to place all of the current POH charges within the wider TI basket, with a sub-basket of RPI-0%.

[86] The LLCC PPC Points of Handover pricing review (the 'POH Statement') was published on 21 September 2011, available at http://stakeholders.ofcom.org.uk/binaries/consultations/revision-points-handover-pricing/statement/final-statement.pdf

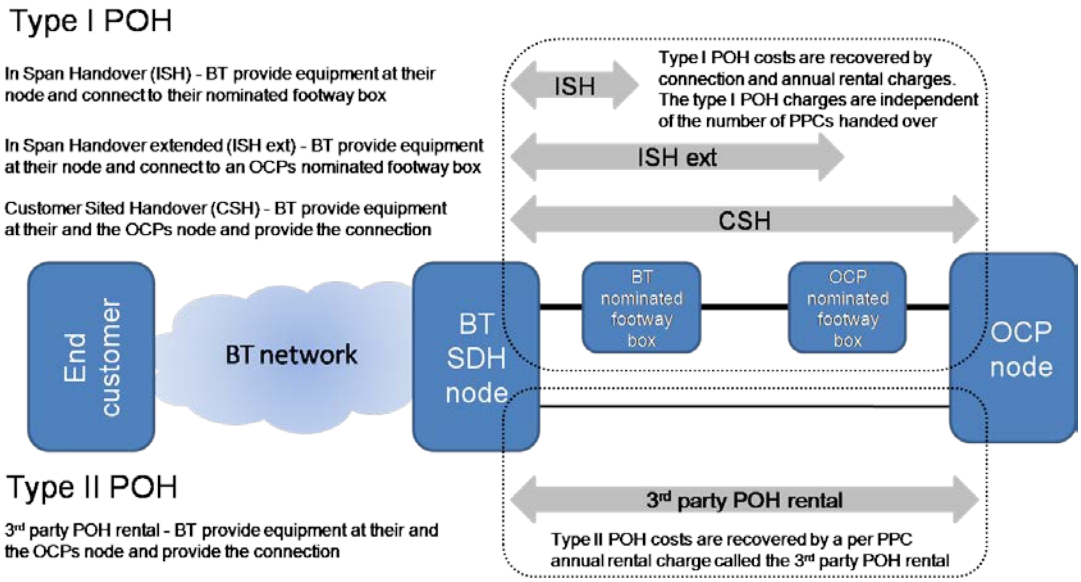
Background

A6.8 As noted above, a POH is an important component which enables infrastructure-based competition. Operators are often reliant on BT for PPCs to link end-user sites back to their own respective core networks. In essence, a POH is the link that connects BT's circuits to an operator's own network. Once it is set up, the operator can hand over as many individual circuits as the capacity of the link allows, at no extra cost.

A6.9 Such a link comprises the physical infrastructure (fibre and duct) and terminating equipment. In the LLCC 2009 we characterised PPC POHs as being either a Type I or a Type II. Figure A6.1 below illustrates those two Types, which can be summed up as follows.

- Type I PPC POHs are purchased by CPs on wholesale terms. There are 212 different charges within this category comprising 108 rental, 100 connection, three additional charges and a bearer charge.
- Type II PPC POHs are legacy products that were initially purchased by CPs from BT on retail terms but have subsequently been migrated onto wholesale PPCs terms. There are four rental charges that apply to the existing installed base of Type II PPC POHs. Connection charges no longer apply since new Type II PPC POHs are no longer available.

Figure A6.1: Types of POH



A6.10 BT recovers its costs through a combination of POH connection and rental charges. Customer specific capital costs are recovered through connection charges and include any equipment that BT installs at either end of the link and that element of the fibre pair between BT's exchange building and the CP's premises that it cannot re-use (i.e. the blown fibre element). Other costs include contractual maintenance charges from BT's equipment suppliers and are recovered through the rental charges.

A6.11 BT also levies an additional charge on all circuits delivered over a POH, aimed at recovering that element of costs not recovered via the previous two charges. We refer to these as the "additional POH charges"[87].

Appeal against the LLCC 2009 Statement

A6.12 C&WW appealed a number of the decisions that we set out in the LLCC 2009, including the additional POH charges. In particular, it appealed our decision on the level of additional POH charges (set on the basis of costs estimates provided by BT) and the particular cost recovery mechanism.

A6.13 On 16 December 2009, the CAT referred to the CC the specified price control matters arising in the LLCC Appeal[88]. On 30 June 2010, the CC notified the CAT of its determination (the 'Determination') of the price control matters[89]. In relation to POH, the CC's Determination was, in summary, that:

- "...Ofcom erred in its use of BT's estimate of the costs to be recovered by the POH charges..." *(Reference Question 4(a)(i); paragraph 5.2 of the Determination)*;

- "...Ofcom erred in concluding that its decision regarding the recovery of POH charges was appropriate for promoting sustainable competition" *(Reference Question 4(a)(iii); paragraph 5.95 of the Determination)*; and

- "...Ofcom did err in giving BT the discretion it did as to future charges for POH..." *(Reference Question 4(b)(i); paragraph 5.288 of the Determination)*.

A6.14 On 20 September 2010, the CAT disposed of the entire appeal[90] and remitted the above POH related issues back to us for further consideration. The CAT required us to do the following:

> "...
> *4. In relation to the error found in Reference Question 4(a)(i), the Tribunal directs OFCOM to assess the reasonableness of the revised BT estimated costs and the determination of the appropriate figure for the new POH charges.*
>
> *5. In relation to the error found in Reference Question 4(a)(iii), the Tribunal directs OFCOM to assess the various regulatory options for implementing new POH charges in the light of the matters set out in the Commission's assessment of Reference Questions 4(a)(ii), (iii) and (iv) and in a manner which puts OFCOM in a position to satisfy its relevant statutory obligations.*
>
> *6. In relation to the error found in Reference Question 4(b)(i), the Tribunal directs OFCOM to decide how POH costs should be*

[87] It is these additional POH costs which we were directed by the Competition Appeal Tribunal ('the CAT') following the CWW appeal to re-consider and which were the focus of the POH Statement. We discuss this below.
[88] http://www.catribunal.org.uk/files/1112_Cable_Wireless_Order_16.12.09.pdf
[89] http://www.competition-commission.org.uk/appeals/communications_act/final_determination_excised_version_for_publication.pdf
[90] http://www.catribunal.org.uk/files/1112_Cable_Wireless_Ruling_200910.pdf

recovered in the light of the matters set out in the Commission's assessment of Reference Question 4(b)(i).

..."

A6.15 Subsequently, Ofcom consulted on options to resolve the points remitted back to it. In September 2011, we published the POH Statement that set out our decision mandating changes to the additional POH charges and Type II rental charges. We based our final proposals for these charges on a LRIC-based bottom-up model of BT's costs.

Current PPC POH revenues

A6.16 Table A6.1 below shows a breakdown of the PPC POH revenues from BT's RFS[91]. The figures included in the table are based on the 2010/11 RFS and therefore do not reflect the impact on revenues of the adjustments we mandated to Type I additional charges and Type II rental charges in the POH Statement. In 2010/11 revenue from all PPC POH charges accounted for £8m out of BT's total TI revenue of £898m. This includes both connection and rental charges.

A6.17 In estimating revenue for 2011/12, if we were to assume similar volumes of connection and rental charges to those seen in 2010/11, we would still see lower revenues due to the reductions in Type I additional charges implemented by the POH Statement. In addition, we expect reduction in the revenue due to a decline in the installed base of Type I and II POH circuits.

Table A6.1: Number of PPC POH charges and revenue by type

Type of POH	Charging category	Number of charges per category	2010/11 revenue
Type I	Connection	100	£0.16m
	Rental	108	£3.78m
	Additional charges	4	
Type II	Rental	4	£4.29m
Total			£8.23m

A6.18 The current and expected future demand for new Type I connection charges is very low. In 2010/11, the total revenue for Type I connection charges was just £160k. BT Wholesale has advised us that there were just three new PPC POH connections in 2010/11[92]. The figures for 2011/12 are expected to be similar[93]. This is because TI

[91] See page 75 of BT's 2010/11 RFS: http://www.btplc.com/Thegroup/RegulatoryandPublicaffairs/Financialstatements/2011/CurrentCostFinancialStatements2011.pdf

[92] Although the RFS reported 55 new connections (p.75 of the 2010/11 RFS), BT explained that there were three connections and the remaining reflected [✂], see BT Wholesale response to S135 Notice of 21 May 2012.

[93] On 1 October 2011 BT provided a spreadsheet detailing new POH connections for 08/09, 09/10, 10/11 and the first half of 2011/12 as 100, 51, 3 and 2 respectively.

services are declining as customers gradually migrate to alternative services, resulting in an increase of spare capacity on existing POH and a consequent low requirement for new POH[94].

A6.19 As illustrated by Table A6.1 above, the revenue for PPC POH rental charges is much more significant. In 2010/11, total PPC POH rental revenue was approximately £8m.

Charge controls for PPC POH charges

We propose no starting charge adjustment to charges set in the POH Statement

A6.20 In the POH Statement, we developed a bottom-up LRIC model to set the charges for Type II rental and Type I additional charges (the additional POH charges). These eight charges cover over 50% of the total TI PPC POH revenue for 2010/11 (see Table A6.1 above). We consider that these charges are already set at an efficient level, since they were based on the estimated LRIC for the relevant services in September 2011.

A6.21 As a result, we propose that no starting charge adjustments are needed for Type II rental and Type I additional and bearer charges. We also propose to impose a charge control of RPI-0% on these services.

We propose no starting charge adjustments for Type I connection and rental charges

A6.22 Type I connection charges and rental charges were not covered by our decision in the POH Statement. However, we concluded in the POH Statement that LRIC is more appropriate than a FAC approach for POH charges generally. This reasoning also applies to Type I connection and rental charges. We have therefore reviewed whether there is a need to make any starting charge adjustments to those charges.

Type I connection charges

A6.23 As noted above, there were just three new Type I connections in 2010/11, with total resulting revenues of less than £160k. Minimal new connections are expected in future. However, as there are 100 different connection charges, modelling the LRIC cost of each connection would be a time-consuming and costly task. We do not consider that it would be an appropriate use of regulatory resources to model charges for which there is limited demand, and where the impact on customers and competition would be minimal. We therefore propose to make no starting charge adjustments to these charges.

Type I rental charges

LRIC approach

A6.24 There are 108 Type I rental charges which were not covered by the POH Statement. In the POH Statement, we set the Type II rental charges and Type I

[94] [✂] submission to the BCMR Consultation S.135

additional charges to LRIC using a bottom-up LRIC model. We have considered whether we can use the same approach for the Type I rental charges.

A6.25 The Type I rental charges relate to maintenance costs. BT has 108 such charges. Modelling the exact cost of all of these 108 charges would entail significant resources. However, we are able to review a representative sample of these charges using the model we developed for the Type I additional charges and the Type II rental charges.

A6.26 We have used the model developed for the POH Statement to calculate LRIC estimates for nine of these maintenance charges[95]. The maintenance charges reviewed covered each of the main groups of POH charges. These nine charges represent over 50% of Type I POH rental revenues.

A6.27 Our calculations used data on failure rates and equipment costs, which have been published as part of the POH Statement. Where alternatives exist for POH configurations, we have considered each combination of handover type (CSH, ISH extended and ISH) with each handover bandwidth (2.5Gbit/s, 622Mbit/s and 155Mbit/s). We have then compared our estimates of LRIC, with BT's rental charge.

A6.28 Our review shows that the average level of rental charges is consistent with our LRIC estimates. Specifically, we find that the weighted average price level is consistent with our weighted average LRIC estimate, although some individual charges vary from 15% above our LRIC estimate to 15% below our LRIC estimate.

A6.29 We considered whether to make adjustments to bring the individual charges into line with our LRIC estimates. We considered that this would not be appropriate as our analysis found the overall price level was in line with LRIC, and increasing some charges while decreasing others would be disruptive to customers. We also noted that there is a margin for error in our LRIC estimates, which may make such fine-tuning of charges inappropriate. Finally, we considered that as all POH are purchased by external customers, BT does not have a strategic incentive to increase some POH charges at the expense of others. Based on this analysis, we do not consider that making adjustments would be appropriate.

A6.30 We have considered extending the model to include the rental charges for which we do not currently have data. We consider that this would not be an appropriate use of regulatory resources. The charges reviewed covered each of the main groups of POH charges, and account for over 50% of revenues. We have no reason to believe that the sample used was unrepresentative.

Other options

A6.31 We have also considered other options for setting the starting charges for Type I connections and rentals, in particular:

- setting charges based on a top-down estimate of FAC for these services; or
- applying a proportionate reduction to the existing starting charges based on those resulting from the POH Statement.

[95] The nine charges chosen are SMA-1, SMA-4 and SMA-16 dual fibre 1300nm each for ISH, ISH extension and CSH POH.

Top down estimate of FAC

A6.32 The revenue BT achieved is made up of 100 connection charges and 108 rental charges. BT's RFS and BT's costing system data is insufficiently detailed on the breakdown of revenues and cost allocations to allow us to model the POH connection and rental charges using this published data. This would make a top-down FAC approach unsupportable. Nonetheless, we note that the RFS data for 2010/11 suggests that BT was under-recovering costs for these services[96].

Applying a proportionate reduction to existing starting charges

A6.33 In the POH Statement, we reduced BT's Type I additional charges significantly and increased the Type II rental charges by 16%. This was based on the assessment that the LRIC of providing these services was £2.8m compared to the basis of charges set in the LLCC 2009, which allowed for revenues of £12m.

A6.34 Given the importance of this product for competition, and the direction set by the CC, we have considered whether, in the absence of accurate data to set the Type I connection and rental charges (as discussed above), it would be appropriate to apply the same reduction to these charges. The justification for this would be that BT has incentives to raise these charges as they raise rivals' costs and that, given the strategic nature of this product, it may be appropriate to err on the side of the charges being too low rather than too high.

A6.35 However, we do not propose to apply a reduction to existing starting charges based on our 'additional charge' adjustment, because:

- both the preliminary FAC and LRIC analysis discussed above suggest that BT is not over-recovering in this area; and
- on this basis, such reduction would potentially take the Type I connection charges well below the equipment costs.

Our proposals

A6.36 We propose no starting charge adjustments for PPC POH. In summary, we consider this approach to be most appropriate option because:

- the additional POH charges covered in the POH Statement have recently been set to LRIC;
- there are expected to be minimal new POH connections in future, therefore modelling the costs of the 100 connection charges would involve a disproportionate use of regulatory resources;
- for the remaining BT Type I rental charges, our bottom-up LRIC analysis of a sample of these charges was not inconsistent with the LRIC approach applied to the additional charges; and

[96] BT Current Cost financial Statements for 2011 including Openreach Undertakings Section 8 summary page 75.

- the POH rental charges (excluding the additional POH charges set via the POH Statement) account for a small percentage of the total PPC cost[97].

A6.37 Consequently, as set out in Section 5, we propose to place these charges in a single TI basket with a sub-cap of RPI-0%. Given that POH services may be seen as particularly important for competition as they are essential for infrastructure competition, we consider and so it may be appropriate to err on the side of lower rather than higher charges. We also consider that POHs may be less subject to economies of scale than TI circuits as a whole. Therefore the unit costs of providing these services may not increase in the same way as other TI services as volumes fall.

Question 13: Do you agree with our approach in relation to POH charges? If not, please explain why and propose an alternative approach with supporting information.

[97] We estimate these rental charges would account for a maximum of 3% of the charge for a 2Mbit/s PPC depending on the specific PPC and POH deployment.

Annex 7

Cost of capital

Introduction

A7.1 In this Annex, we set out our detailed proposals for an estimate of BT's cost of capital. This is to be used in the charge controls we are proposing to impose on BT in this consultation in respect of leased lines services.

A7.2 The cost of capital is important for setting charge controls, particularly as it makes up a significant proportion of the cost of most regulated telecommunications services. It is also particularly important to investors to provide them with a reasonable expectation that they can recover their investment and make a reasonable rate of return.

A7.3 This means, in turn, that we attach significant weight to the objective of promoting regulatory predictability by ensuring a consistent regulatory approach over appropriate periods, provided that we are satisfied that the circumstances of a specific case do not warrant us taking a different approach.

Summary of proposals

A7.4 We propose to use a pre-tax real cost of capital estimate for the 'Rest of BT' of 6.5% - as we estimated in the WBA CC (along with separate estimates of the cost of capital for 'BT Group' and 'Openreach', respectively) [98]. These estimates are shown in Table A7.1 below.

Table A7.1: BT Cost of capital July 2011

	Openreach	BT Group	Rest of BT
Real risk-free rate	1.4%	1.4%	1.4%
Inflation	3%	3%	3%
Nominal risk-free rate	4.4%	4.4%	4.4%
Equity beta	0.67 – 0.94	0.77 – 1.04	0.87 – 1.14
Asset beta	0.41 – 0.55	0.46 – 0.59	0.51 – 0.65
ERP	5%	5%	5%
Gearing	50%	50%	50%
Debt premium	2%	2 – 2.5%	2.5%
Debt beta	0.15	0.15	0.15
Tax rate	24%	24%	24%
Pre-tax real WACC	**5.6%**	**6.1%**	**6.5%**
Pre-tax nominal WACC	**8.8%**	**9.2%**	**9.7%**

[98] Table 6.3, page 97 of the WBA CC Statement: http://stakeholders.ofcom.org.uk/binaries/consultations/823069/statement/statement.pdf

A7.5 The reason why we estimate and apply different costs of capital for different parts of BT (Openreach, BT Group and the Rest of BT) is essentially because they have different systematic risk profiles[99]. We consider that the WACC applicable to the Rest of BT (the 'Rest of BT WACC') is appropriate for the leased lines services covered by our proposed charge control. This is based on an assessment of the cyclicality of demand for leased lines services and, to a lesser extent, an analysis of the underlying asset base. We discuss this analysis in Section 4 of the main document.

A7.6 We estimated the WACC for Openreach, BT Group and the Rest of BT, respectively, in detail in the WBA CC[100]. In that Statement, we explained that we intended to use the WACC figures estimated in the WBA CC Statement for future relevant charge controls, provided that the estimates remain relevant. We noted that consistency is important, but that this needs to be balanced against the possible need for updating those cost of capital estimates. Specifically, we stated that:

> "The cost of capital estimates for BT...have been calculated for the purposes of the WBA charge control which will apply to 2013/14. However, we intend to apply these rates to other relevant charge controls. In the case of the forthcoming WLR/LLU charge controls, for example, we note that the charge control statement is likely to be published towards the end of 2011.
>
> We intend to apply the cost of capital estimates shown below to the relevant charge controls. However, we will review the evidence on the individual parameters at the time of the publication of these charge controls to ensure that the estimates remain relevant. If the evidence suggests that these cost of capital estimates are no longer appropriate, we will update the estimates. However, in deciding whether an update is necessary, we will have regard to the importance of maintaining a consistent approach[101]."

A7.7 That statement reflected two important considerations.

- First, that consistency is important in order to provide investors with a reasonable expectation that they can recover their investment and make a reasonable rate of return. We believe that this creates a regulatory environment which encourages efficient investment.

- Second, having regard to the desirability of a consistent approach, any decision would need to be appropriate in the context of any future charge control review. It would be inappropriate for us to fetter our discretion as to future charge control reviews.

[99] What we describe as the Openreach WACC is more specifically a rate for BT's copper access services business. The remainder of BT Group activities are classed as the Rest of BT, and the Rest of BT WACC is applied to them.
[100] The cost of capital estimated in the WBA Statement was appealed by BT. This appeal has recently been concluded and the CAT upheld Ofcom's estimate for the purposes of that Statement. Full details are available at:
http://www.catribunal.org.uk/237-7278/1187-3-3-11-British-Telecommunications-plc-Wholesale-Broadband-Access-Charge-Control.html
[101] See paragraph 6.7 to 6.8 of the WBA Statement.

A7.8 In light of this position, we considered whether our estimate of BT's cost of capital calculated for the purposes of the WBA CC remained appropriate in the subsequent WLR LLU CC (which we published in March 2012) [102]. In the Statement, we reviewed the most recent evidence on the individual parameters to ensure that the estimates remained relevant. We concluded that they were appropriate.

Reasons why the estimates used in the WBA Statement remain appropriate for current leased lines proposals

A7.9 We consider that the cost of capital estimated in the WBA Statement remains appropriate for the proposed charge control set out in this consultation, without the need to update the estimates.

A7.10 Our updated analysis was performed just a few months ago in the WLR LLU CC. As noted above, we found that the WBA CC remained appropriate and we have not identified any reasons for a need to undertake additional analysis for the purposes of coming to a provisional view on the cost of capital to be used in this consultation.

A7.11 In reaching this provisional view, we have also taken account of the recent Determination in respect of BT's appeal against our decisions in the WBA CC concerning the cost of capital, as noted above. However, we intend to consider any movements in the cost of capital parameters prior to reaching a decision on the proposals set out in this consultation for leased lines in order to ensure that the proposed estimate of the WACC remains appropriate. If the relevant parameters have changed materially, we will consider whether a change to our cost of capital estimates would be appropriate.

A7.12 In the WLR LLU CC, we set out why the cost of capital estimates in the WBA CC remained appropriate, based on the following reasoning:

- there had been no significant change in the majority of parameters to warrant a change in our estimates from those in July 2011;
- we observed an increase in the 2-year BT Group asset beta and a decrease in the risk free rate since July 2011. The exact magnitude of these opposing changes was uncertain, however we expected the net effect on the overall WACC to be small; and
- we also noted the principle set out in the WBA CC that consistency is important in order to provide investors with a reasonable expectation that they can recover their investment and make a reasonable rate of return. We continue to believe that this creates a regulatory environment which encourages efficient investment.

A7.13 We should note that, in updating our analysis of the individual parameters in the WLR LLU CC, our methodology remained consistent with that set out in the WBA CC. We are, however, proposing to undertake a review of our cost of capital methodology later this year.

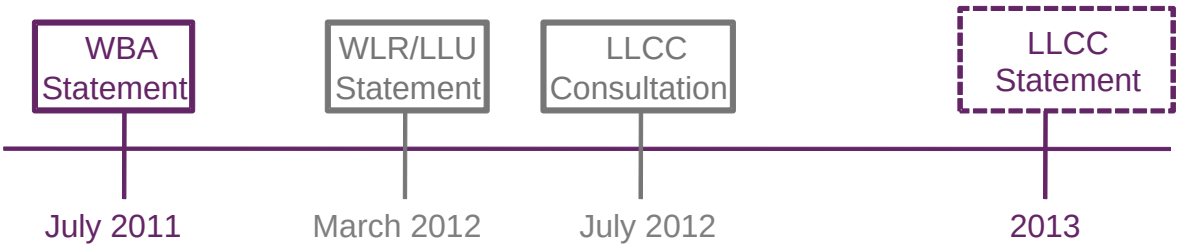
A7.14 As we expect to consult on any revised cost of capital methodology in Autumn 2012 and then to issue a statement in 2013, our decision on the proposed charge controls for leased lines is expected to be made ahead of that Statement. We will

[102] See Annex 8 of the WLR LLU CC Statement: http://stakeholders.ofcom.org.uk/binaries/consultations/wlr-cc-2011/statement/annexesMarch12.pdf

therefore continue to use our current methodology (as set out in the WBA CC Statement) for the purposes of assessing any changes in the relevant parameters and in making that decision.

A7.15 Figure A7.1 below shows the timing of our recent consultations and statements in relation to the cost of capital.

Figure A7.1: Cost of capital timeline



A7.16 In arriving at our proposal not to adjust the WACC set out in the WBA CC within our provisional view on the cost of capital, we have also had particular regard to:

- the proximity of this consultation to the WLR LLU CC, including our updated analysis as published in March 2012; and
- the small and uncertain likely impact on the overall WACC of the changes in parameter values observed since July 2011, as set out in the WLR LLU CC.

A7.17 We set out our discussion of the movements in the parameters of the WACC below from the WLR LLU CC.

Key parameter values – as assessed in the WLR LLU CC

There has been no significant change in several parameters

A7.18 As set out in the WBA CC, for reasons of consistency, we proposed to apply the rates in Table A7.1 in all relevant charge controls, providing the estimates of the individual parameters remain appropriate[103].

A7.19 We therefore considered, as part of the WLR LLU CC, the individual parameters used to arrive at the cost of capital. We set out the revised estimates of each of these parameters, as updated for the WLR LLU CC below. In summary, we noted that we do not consider that there has been a material change in the following parameters from July 2011 to warrant a revised estimate:

- equity risk premium ('ERP');
- debt premium; and
- inflation.

A7.20 We observed changes in the following parameters since our July 2011 estimates:

- BT Group Beta; and the

[103] See paragraph 6.7-6.8 of the WBA Statement.

- risk-free rate;

A7.21 As stated above, we observed an increase in the two-year BT Group asset beta and a decrease in the risk free rate since July 2011.

A7.22 In addition, we note that the expected corporation tax rate for 2014/15 has fallen as a result of the March 2012 budget announcement.

A7.23 We discuss each of these parameters in more detail below.

Equity risk premium

A7.24 We estimated the ERP to be 5% in the WBA Statement. This reflected recent work by Professors Dimson, Marsh and Staunton (DMS)[104] from the London Business School, which tracks the average premium that investors have earned from equities (as opposed to bonds or gilts) over time.

A7.25 In addition, we considered regulatory benchmarks, market commentary and academic/user surveys.

A7.26 We did not consider that there was compelling evidence to suggest that an ERP of 5% was no longer appropriate, in particular as it was based on recent DMS evidence.

A7.27 The latest historical ERP evidence reported by DMS, in the 2012 sourcebook, shows that the historic premium of equities over bonds for the UK is 5%. In addition, in the 2012 report, DMS have suggested a long-run arithmetic mean premium for the world index of around 4.5%-5%.

Debt premium

A7.28 We estimated the debt premium for BT Group to be within the range 2%-2.5% in the July 2011 WBA Statement[105]. This is consistent with the proposed estimate in the WBA CC Consultation[106].

A7.29 This was estimated by reference to the yield on BT's 2016 sterling denominated bond, over and above benchmark gilt yields[107]. We updated our analysis to January 2012. Over the 6 month period (to January 2012), the spread on BT's 2016 bond, over the benchmark, remained broadly in this range. We noted that it fell below 2% in July 2011, and increased above 2.5% in November/December 2011, however it subsequently fell below 2.5%. We therefore believe that the range 2%-2.5% remains appropriate.

[104] Dimson, Marsh and Staunton "Credit Suisse Global Investment Returns Sourcebook 2011" Credit Suisse Research Institute. See paragraph 6.79-6.96 WBA Statement.
[105] See paragraph 6.54 to 6.78 WBA CC Statement:
[106] See paragraph 6.145 to 6.150 of the WBA CC Consultation:
http://stakeholders.ofcom.org.uk/binaries/consultations/823069/summary/condoc.pdf
[107] We use BT's 2016 GBP bond for the purpose of estimating the debt premium for BT. This bond is the most suitable since it is the shortest-dated GBP bond in issuance by BT, and therefore is the closest match to the charge control period. We also note that GBP bonds of longer maturity exhibit similar premia above equivalent period gilts.

Inflation

A7.30 We noted in the WBA CC that an inflation assumption of 3% reflected an appropriate estimate of market expectations of RPI for the purposes of estimating the WACC. We note that the WBA CC and the LLCC are modelled in real terms, therefore the real pre-tax WACC is used.

A7.31 In the WBA CC, we explained that we would ensure that the RPI forecast for modelling asset price changes and the RPI used to forecast the cost of capital would be consistent. We have used an equivalent approach here.

A7.32 Asset price changes, for the purposes of the proposed charge control for leased lines services are modelled using a forecast RPI of 3% for 2015/16. Therefore we consider that the forecast inflation of 3% used to calculate the nominal WACC remains appropriate.

Recent data suggests movements in the asset beta and risk-free rate

A7.33 As part of the WLR LLU CC, we considered more recent data for the risk-free rate and BT Group beta and observed an increase in the asset beta and a fall in the risk free rate.

Asset beta

A7.34 We set out our methodology for assessing the asset beta for BT Group in the WBA CC[108]. The asset beta for BT Group is calculated by de-levering the equity beta for a given time period at the average gearing observed over that same period[109]. In the WBA CC, we estimated an asset beta range of 0.46-0.59.

A7.35 We updated the estimate of the asset beta for BT Group, in the WLR LLU CC, using revised data from Bloomberg which is set out in Table A7.2 below. We noted that the 2-year daily asset beta increased from the WBA asset beta of 0.525 to approximately 0.64.

A7.36 We noted that the 1-year daily beta also increased relative to that estimated in July 2011, however the 5-year weekly beta remained within the range estimated in the WBA Statement[110] (0.46 – 0.59).

[108] See paragraph 6.97 to 6.154 of the WBA CC Statement:

[109] We then re-lever the asset beta using an appropriate gearing level. In the WBA Statement, the gearing used to re-lever the asset beta was based on the historic average gearing level. In the WBA Statement, we noted that it may be appropriate to use a forward looking gearing for the purpose of re-levering, however the impact of using a different gearing on the overall WACC was negligible. As part of the WBA appeal, the Competition Commission considered that using a prospective gearing assumption is preferable to using a historic average. However, it found that Ofcom did not err in its calculation of the beta as the impact was negligible. As a result, in future, when re-levering the asset beta, we will use prospective gearing. But we are not proposing to amend our re-levered beta estimate for the purposes of the proposed charge control for leased lines set out in this consultation as we consider it would have a negligible impact on the overall WACC. We note that the CC upheld our decision to use the historic average gearing to de-lever the equity beta and we will therefore continue with this approach to estimating the asset beta.

[110] As explained in the WBA Statement, we place greatest weight on the 2-year beta. However, the 5-year weekly beta provides a useful cross-check, particularly during periods of financial market volatility.

Table A7.2: Revised BT Group beta estimates (9th January 2012)

	1 year daily data	2 year daily data	5 year weekly data
Equity beta	1.06	1.04	0.86
Average Gearing	39%	44%	40%
Asset beta	0.70	0.64	0.57

A7.37 All other things being equal, a change in the asset beta could potentially support a modest increase in the cost of capital for BT Group.

A7.38 Although we note the asset beta may have increased over the last six months, this cannot be looked at in isolation. If we were to update the asset beta, we would also have to update the risk free rate, where we continue to observe a downward trend in estimates

Risk-free rate

A7.39 In contrast to the asset beta, we noted in the WLR LLU CC that the risk-free rate had fallen further since the publication of the WBA CC in July 2011. In the WBA CC, our estimate of the risk-free rate was 1.4%. In arriving at this estimate, we considered average yields on indexed linked gilts and implied forward rates. Table A7.3 below shows the movements in these datasets since July 2011.

Table A7.3: Changes in index-linked ("i-l") gilt evidence

	WBA CC Statement July 2011, %	WLR LLU CC Statement Feb 2012, %
Avge of last 5 years for 5 yr i-l gilts	1.2	0.8
Avge of last 10 years for 5 yr i-l gilts	1.6	1.3
Avge of last 5 years for 10 yr i-l gilts	1.3	1.0
Avge of last 10 years for 10 yr i-l gilts	1.6	1.5
Implied forward rate on 5 yr i-l gilt at Feb 2014[111]	c0.9	c(0.5)

Source: Bank of England

A7.40 The continued downward trend in gilt yields and forward rates implies a reduction in the risk-free rate. We discuss these estimates in more detail below.

A7.41 In the WBA CC, we considered implied forward rates on five year gilts. We noted that these had declined significantly and were out of line with the observed historic gilt yields. We updated our analysis and this continued to be the case. We noted that the implied forward rates on indexed linked gilts are now below zero.

[111] The estimates for Jan 2012 and July 2011 represent the implied future yield on an investment in a five year ILG made in 2.5 and 2 years respectively calculated using the following formula: $f_{t,T} = \left[\frac{(1+r_T)^T}{(1+r_t)^t}\right]^{\frac{1}{T-t}} - 1$.

A7.42 The implied forward rates continue to be volatile and we remain cautious about placing significant weight on these rates.

A7.43 Calculating the risk-free rate using the five year averages of ten year and five year indexed linked gilts also suggested a reduction in the risk-free rate from 1.4%. These averages are shown in Table A7.4 below.

Table A7.4: five and ten year gilt yields average rate (real)

Average period	ten year gilts (%)	five year gilts (%)
6th January 2012	-0.7	-1.4
1 month	-0.5	-1.3
3 months	-0.3	-1.2
1 year	0.2	-0.8
2 years	0.4	-0.5
5 years	1.1	0.8
10 years	1.5	1.3

Source: Bank of England

A7.44 Table A7.4 above reflects falls in real gilt yields over the year to January 2012. Only one data point (ten year average on a ten year gilt) was above our estimate of the risk-free rate, and this had fallen from 1.6% in July 2011. We noted that all other average rates remained below the risk free rate of 1.4% estimated in July 2011.

A7.45 All other things being equal, this could potentially support a modest decrease in the cost of capital for BT Group.

Tax rate

A7.46 We updated the tax rate in July 2011 to take account of the acceleration of the corporate tax rate reduction, announced in the March 2011 Budget. The expected rate of UK corporation tax rate from 2013/14 was predicted to be 24% at the time of the WBA CC.

A7.47 The March 2012 Budget set out plans for a further acceleration of the corporation tax rate reduction. The most recent expectation of the main rate of UK corporation tax for the year beginning 1 April 2013 is now 23% and the expected rate for the year beginning 1 April 2014 is now 22%[112].

A7.48 We are not proposing to update the cost of capital to take account of the most recent movements in other parameters in this consultation, therefore we have not updated our estimate of the lower corporation tax rates announced. However, we will update our estimate of the corporation tax rate when we calculate the WACC at the time of the statement.

[112] http://www.hm-treasury.gov.uk/budget2012_fair_efficient_tax.htm

A7.49 As the charge control is proposed to run to 2015/16, we propose to use the expected corporation tax rate of 22% in calculating the Rest of BT WACC for the purposes of our decision on the present proposals.

A7.50 We expect the reduction from 24% to 22% to reduce the Rest of BT WACC by less than 0.2%.

Net impact on the cost of capital

A7.51 We consider that updating BT's estimated cost of capital to take account of recent movements in the asset beta, the risk free rate and the tax rate would not materially change our overall estimate from that in July 2011.

A7.52 Given the uncertainty around the risk free rate and the asset beta, and the overall margin of error in estimating the WACC, we do not think there is sufficient evidence to warrant a change in the WACC.

A7.53 We have been particularly mindful of the views of the Competition Commission on the mechanics of the Capital Asset Pricing Model ('CAPM'"). In its Determination of the LLU Appeal, the Competition Commission noted:

> "...the estimation of the cost of equity, which dominates the overall calculation of the WACC, has a significant margin of error[113]".

A7.54 We have also borne in mind the principle set out in the WBA CC that consistency is important in order to provide investors with a reasonable expectation that they can recover their investment and make a reasonable rate of return. We continue to believe that this creates a regulatory environment which encourages efficient investment.

A7.55 Therefore, given the proximity to the WLR LLU CC, the small and uncertain likely impact on the overall WACC and the need for consistency, we do not think that updating the cost of capital is justified at this stage.

Sensitivity analysis

A7.56 As noted above, we intend to review the cost of capital parameters prior to the publication of our statement on the present proposals. This is to ensure that our cost of capital estimate remains appropriate for the purposes of this leased lines charge control.

A7.57 In order to assist readers' understanding of potential implications of any changes in the cost of capital, we have undertaken a sensitivity analysis. This is set out in Section 5 for TI and Section 6 for Ethernet. It shows the impact on the proposed X of a 1% increase and 1% decrease in the Rest of BT WACC.

Proposals

A7.58 For the reasons set out above, our provisional proposal is to use the WACC estimated in the WBA CC for the purposes of setting the charge controls for the leased line services. We propose to use the pre-tax real Rest of BT rate of 6.5%.

[113] Case 1111/3/3/09 The Carphone Warehouse Group Plc v Office of Communications (Local Loop Unbundling), Determination of the Competition Commission dated 31 August 2010 at §2.406: http://www.catribunal.org.uk/237-4154/1111-3-3-09-The-Carphone-Warehouse-Group-Plc.html

A7.59 We intend to consider any changes in the cost of capital parameters prior to making a decision on our proposals, in order to ensure that the proposed estimate of the WACC remains appropriate. If the relevant parameters have changed materially, we will consider whether a change to our cost of capital estimates would be appropriate. We have illustrated the potential impacts of such changes within our sensitivity analysis for both TI and Ethernet services.

Question 14: Do you agree with our proposals for the treatment of cost of capital? If not, please explain why and propose an alternative approach with supporting information.

Annex 8

Draft Legal Instrument

NOTIFICATION OF PROPOSALS UNDER SECTION 48A OF THE COMMUNICATIONS ACT 2003

Proposals for the setting of SMP services conditions in relation to BT under section 45 of the Communications Act 2003

Background

A8.1 On 18 June 2012, the Office of Communications ("Ofcom") published its consultation document entitled "Business Connectivity Market Review, Review of the retail leased lines, wholesale symmetric broadband origination and wholesale trunk segments markets" (the "BCMR Consultation").

A8.2 Annex 14 of the BCMR Consultation sets out the Notification (the "BCMR Notification") under sections 48A and 80A of the Communications Act 2003 (the "Act"), in accordance with sections 48(1) and section 80(1) of the Act, in which Ofcom proposes to:

- identify certain markets;
- make market power determinations; and
- set SMP services conditions.

A8.3 In the BCMR Notification, Ofcom proposes to identify, among others, the following markets for the purpose of making proposed market power determinations:

a) the wholesale market for low bandwidth traditional interface symmetric broadband origination in the UK excluding the Hull Area, at bandwidths up to and including 8Mbit/s;

b) the wholesale market for medium bandwidth traditional interface symmetric broadband origination in the UK excluding the Hull Area and the WECLA, at bandwidths above 8Mbit/s and up to and including 45Mbit/s;

c) the wholesale market for high bandwidth traditional interface symmetric broadband origination in the UK excluding the Hull Area and the WECLA, at bandwidths above 45Mbit/s and up to and including 155Mbit/s;

d) the wholesale market for regional trunk segments in the UK;

e) the wholesale market for low bandwidth alternative interface symmetric broadband origination in the WECLA, at bandwidths up to and including 1Gbit/s;

f) the wholesale market for low bandwidth alternative interface symmetric broadband origination in the UK excluding the Hull Area and the WECLA, at bandwidths up to and including 1Gbit/s;

g) the wholesale market for multiple interface symmetric broadband origination in the UK excluding the Hull Area and the WECLA; and

h) the retail market for low bandwidth traditional interface symmetric broadband origination in the UK excluding the Hull Area, at bandwidths up to and including 8Mbit/s.

A8.4 In the BCMR Notification, Ofcom makes a proposed market power determination for BT in relation to all markets set out in A8.3 above.

A8.5 In the BCMR Notification, Ofcom proposes to set certain SMP service conditions on BT in relation to such of those markets it proposes to identify as are specified in Schedule 2 to the BCMR Notification. However, in the BCMR Notification, Ofcom did not proceed with specifying proposed SMP price control conditions within the meaning of section 87(9) of the Act.

A8.6 In the BCMR Notification, Ofcom stated that "[i]nsofar as SMP condition 5 [Charge Controls], as set out in Schedule 2 [to the BCMR Notification] and regarding network access pricing, is concerned, these SMP conditions are contained in a separate Notification". Ofcom explained in the BCMR Consultation that details of its proposals regarding the setting of the SMP price control conditions including the services to which they should apply, and the proposed SMP price control conditions themselves, would be consulted on separately.

A8.7 Accordingly, in this Notification, Ofcom specifies its proposed SMP price control conditions in that regard. These proposals are made by reference to the proposed market power determinations referred to in the BCMR Notification and, as such, are to be treated as supplementary to the BCMR Notification.

Proposals

Proposals to set SMP price control conditions

A8.8 Ofcom hereby gives notice of its proposals, in accordance with section 48A of the Act, to set the following SMP price control conditions, pursuant to its powers under section 87(9) of the Act, on BT:

- SMP condition 5.1 in relation to proposed markets a) to d) above in paragraph A8.3;
- SMP condition 5.2 in relation to proposed market e) above in paragraph A8.3;
- SMP condition 5.3 in relation to proposed markets f) and g) above in paragraph A8.3;
- SMP condition 5.4 in relation to proposed market h) above in paragraph A8.3;
- SMP condition 5.5 in relation to proposed markets a) to g) above in paragraph A8.3; and
- SMP condition 5.6 in relation to proposed markets a) to g) above in paragraph A8.3.

A8.9 The proposed SMP price control conditions in paragraph A8.8, and the services to which each of the proposed SMP price control conditions in paragraph A8.8 apply, are set out in the Schedule to this Notification.

A8.10 The effect of, and Ofcom's reasons for making, the proposed SMP price control conditions are set out in the consultation document accompanying this Notification.

Ofcom's duties and legal tests

A8.11 For the reasons set out in the consultation document accompanying this Notification, in proposing to set the SMP price control conditions, Ofcom has:

- considered and acted in accordance with its general duties set out in section 3 of the Act and the six Community requirements in section 4 of the Act; and
- taken due account of all applicable recommendations in accordance with section 4A of the Act.

A8.12 For the reasons set out in the consultation document accompanying this Notification, Ofcom is satisfied that all applicable legal tests would be met if the proposed SMP price control conditions were to be imposed on BT, including the tests in sections 88 and 47(2) of the Act.

Representations

A8.13 Representations may be made to Ofcom about the proposals set out in this Notification and the accompanying consultation document no later than 30 August 2012.

A8.14 A copy of this Notification and the accompanying consultation document have been sent to the Secretary of State, in accordance with section 48C(1) of the Act.

Interpretation

A8.15 Except for reference made to proposed identified markets in paragraph A8.3 above, and except also as otherwise defined in this Notification, words or expressions used shall have the same meaning as in the Act.

A8.16 In this Notification:

"**BT**" means British Telecommunications plc, whose registered company number is 1800000 and any British Telecommunications plc subsidiary or holding company, or any subsidiary of that holding company, all as defined in section 1159 of the Companies Act 2006;

"**Hull Area**" means the area defined as the 'Licensed Area' in the licence granted on 30 November 1987 by the Secretary of State under section 7 of the Telecommunications Act 1984 to Kingston upon Hull City Council and KCOM Group plc, whose registered company number is 2150618;

"**WECLA**" means the area in London consisting of the postal sectors set out in Schedule 1 to the BCMR Notification.

A8.17 For the purpose of interpreting this Notification:

- headings and titles shall be disregarded; and
- the Interpretation Act 1978 (c. 30) shall apply as if this Notification were an Act of Parliament.

A8.18 The Schedule to this Notification shall form part of this Notification.

.....

Competition Policy Director, Ofcom

A person duly authorised in accordance with paragraph 18 of the Schedule to the Office of Communications Act 2002

5 July 2012

Schedule

[DRAFT] SMP service conditions 5.1, 5.2, 5.3, 5.4, 5.5 and 5.6 imposed on BT under the Communications Act 2003 as a result of the analysis of the markets listed below in which BT has been found to have significant market power

Part 1: Application

SMP service conditions 5.1, 5.2, 5.3, 5.4, 5.5 and 5.6 shall apply to the Dominant Provider in each of the relevant markets listed in Column 1 of Table 1 below to the extent specified in Column 2 of Table 1.

Table 1: Relevant markets for the purposes of this Schedule

Column 1: Relevant market		***Column 2: Applicable SMP price control conditions as set out in Parts 3 to 8 of this Schedule***
(1)	Wholesale market for low bandwidth traditional interface symmetric broadband origination in the UK excluding the Hull Area, at bandwidths up to and including 8Mbit/s	Conditions 5.1, 5.5 and 5.6
(2)	Wholesale market for medium bandwidth traditional interface symmetric broadband origination in the UK excluding the Hull Area and the WECLA, at bandwidths above 8Mbit/s and up to and including 45Mbit/s	Condition 5.1, 5.5 and 5.6
(3)	Wholesale market for high bandwidth traditional interface symmetric broadband origination in the UK excluding the Hull Area and the WECLA, at bandwidths above 45Mbit/s and up to and including 155Mbit/s	Condition 5.1, 5.5 and 5.6
(4)	Wholesale market for regional trunk segments in the UK	Condition 5.1, 5.5 and 5.6
(5)	Wholesale market for low bandwidth alternative interface symmetric broadband origination in the WECLA, at bandwidths up to and including 1Gbit/s	Condition 5.2, 5.5 and 5.6
(6)	Wholesale market for low bandwidth alternative interface symmetric broadband origination in the UK excluding the Hull Area and the WECLA, at bandwidths up to and including 1Gbit/s	Condition 5.3, 5.5 and 5.6
(7)	Wholesale market for multiple interface symmetric broadband origination in the UK excluding the Hull Area and the WECLA	Condition 5.3, 5.5 and 5.6
(8)	Retail market for low bandwidth traditional interface symmetric broadband origination in the UK excluding the Hull Area, at bandwidths up to and including 8Mbit/s	Condition 5.4

Part 2: Definitions and interpretation
In this Schedule:

"**Accommodation Services**" means the products and services listed in Section 1 of the Annex to Condition 5.5;

"**AI WECLA Services**" means the products and services listed in Section 1 of the Annex to Condition 5.2;

"**BT**" means British Telecommunications plc, whose registered company number is 1800000 and any British Telecommunications plc subsidiary or holding company, or any subsidiary of that holding company, all as defined in section 1159 of the Companies Act 2006;

"**Carry Forward Percentage**" is to be determined:

(a) for the purposes of Condition 5.1, in accordance with paragraphs 5.1(e) and (f);

(b) for the purposes of Condition 5.3, in accordance with paragraphs 5.3(e) and (f); and

(c) for the purposes of Condition 5.4, in accordance with paragraphs 5.4(e) and (f);

"**Controlling Percentage**" is to be determined:

(a) for the purposes of Condition 5.1, in accordance with paragraph 5.1(d);

(b) for the purposes of Condition 5.3, in accordance with paragraph 5.3(d); and

(c) for the purposes of Condition 5.4, in accordance with paragraph 5.4(d);

"**Dominant Provider**" means BT;

"**ECC Services**" means the products and services listed in Section 1 of Annex A to Condition 5.6;

"**Ethernet All Other Sub-cap Services**" means the products and services listed in Section 2 of the Annex to Condition 5.3;

"**Ethernet Interconnection Services Sub-basket**" means the products and services listed in Section 1 of the Annex to Condition 5.3;

"**Ethernet Services Basket**" means the products and services listed in Sections 1 to 2 of the Annex to Condition 5.3;

"**First Relevant Year**" means a period of 12 months, unless Ofcom determines otherwise in which case the period will be less than 12 months and such period as Ofcom determines. For the avoidance of doubt, any reference to a Relevant Year includes the First Relevant Year unless the context otherwise requires;

"**GBCI**" means the amount of the change in the General Building Cost Index (GBCI) in the period of twelve months ending on 30 May immediately before the beginning of a Relevant Year, expressed as a percentage (rounded to two decimal places) of GBCI as at the beginning of that first mentioned period. The GBCI is published by the Building Cost Information Service (BCIS), a service of the Royal Institute of Chartered Surveyors;

"**Overlapping Accommodation Services**" means the products and services listed in Section 2 of the Annex to Condition 5.5;

"**Relevant Financial Year**" means the period of 12 months ending on 31 March immediately preceding the Relevant Year;

"**Relevant Markets**" means markets (1) to (7) set out in Column 1 of Table 1 of Part 1 to this Schedule;

"**Relevant Year**" means any of the three periods of 12 months, subject to Ofcom determining that the First Relevant Year is period less than 12 months;

"**Retail Analogue Services Basket**" means the products and services listed in Section 1 of the Annex to Condition 5.4;

"**Retail Analogue Sub-cap Services**" means the products and services listed in Section 1 of the Annex to Condition 5.4;

"**Retail Prices Index**" means the index of retail prices compiled by an agency or a public body on behalf of Her Majesty's Government or a governmental department (which is the Office for National Statistics at the time of publication of this Notification) from time to time in respect of all items;

"**RPI**" means the amount of the change in the Retail Prices Index (All Items) in the period of twelve months ending on 30 May immediately before the beginning of a Relevant Year, expressed as a percentage (rounded to two decimal places) of that Retail Prices Index as at the beginning of that first mentioned period;

"**Starting Charge Adjustment Value**" means for the purposes of Condition 5.6 the relevant value for specific product or service, *i*, as specified in Annex B to Condition 5.6;

"**TI All Other Sub-cap Services**" means the products and services listed in Section 4 of the Annex to Condition 5.1;

"**TI Ancillary, Equipment and Infrastructure Sub-cap Services**" means the products and services listed in Section 3 of the Annex to Condition 5.1;

"**TI Basket**" means the products and services listed in Sections 1 to 4 of the Annex to Condition 5.1;

"**TI Mobile Services Sub-basket**" means the products and services listed in Section 1 of the Annex to Condition 5.1;

"**TI POH Sub-basket**" means the products and services listed in Section 2 of the Annex to Condition 5.1;

For the purpose of interpreting the SMP conditions in Parts 3 to 8 of this Schedule:

- except insofar as the context otherwise requires, words or expressions shall have the meaning assigned to them in paragraph 1 of this Part 2 and otherwise any word or expression shall have the same meaning as it has in the Act;
- headings and titles shall be disregarded; and
- the Interpretation Act 1978 (c. 30) shall apply as if each of the SMP conditions in Parts 3 to 8 of this Schedule were an Act of Parliament.

Part 3: Condition 5.1

Controls of the TI Basket

(a) Subject to paragraph **(b)**, the Dominant Provider shall take all reasonable steps to secure that, at the end of each Relevant Year, the Percentage Change (as determined in accordance with paragraph **(c)**) in the aggregate of charges for all of the products and services in the TI Basket is not more than the Controlling Percentage (as determined in accordance with paragraph **(d)**).

(b) For the purpose of complying with paragraph **(a)**, the Dominant Provider shall take all reasonable steps to secure that the revenue it accrues as a result of all relevant individual charge changes during any Relevant Year shall be no more than that which it would have accrued had it made a single charge change equal to the Controlling Percentage on the first day of the Relevant Year.

For the avoidance of doubt, this obligation shall be deemed to be satisfied where the following formula is satisfied:

$$\sum_{i=1}^{n}\left[W_1 R_i \frac{(p_{1,i} - p_{0,i})}{p_{0,i}} + W_t R_i \frac{(p_{t,i} - p_{0,i})}{p_{0,i}}\right] \leq TRC$$

where:

n is the number of products and services in the specified category (i.e. the basket in question);

$p_{0,i}$ is, save for the First Relevant Year of the control, the published charge made by the Dominant Provider for the specific product or service, *i*, at the beginning of the Relevant Year excluding any discounts offered by the Dominant Provider;

$p_{1,i}$ is the published charge after the first change in charge made by the Dominant Provider for the specific product or service, *i*, in the Relevant Year excluding any discounts offered by the Dominant Provider;

$p_{t,i}$ is the published charge made by the Dominant Provider for the specific product or service, *i*, at time, *t*, during the Relevant Year excluding any discounts offered by the Dominant Provider;

R_i is the sum of the revenue accrued during the Relevant Financial Year in respect of the specific product or service, *i*, and the revenue accrued during the Relevant Financial Year in respect of equivalent products or services provided by the Dominant Provider to itself, calculated to exclude any discounts offered by the Dominant Provider;

W_1 is the proportion of the Relevant Year in which the first charge change applies, calculated by the number of days during which the charge was in effect and dividing by 365 (366 in a leap year);

W_t is the proportion of the Relevant Year in which each subsequent charge, p_t, is in effect, calculated by the number of days during which the charge is in effect and dividing by 365 (366 in a leap year); and

TRC is the target revenue change required in the Relevant Year to achieve compliance with paragraph **(a)**, calculated by the Controlling Percentage multiplied by the revenue accrued during the Relevant Financial Year.

(c) The Percentage Change for the purpose of the TI Basket specified in paragraph **(a)** shall be calculated by employing the following formula:

$$C_t = \frac{\sum_{i=1}^{n}\left[R_i \frac{(p_{t,i} - p_{0,i})}{p_{0,i}}\right]}{\sum_{i=1}^{n} R_i}$$

where:

C_t is the Percentage Change in the aggregate of charges for the products and/or services in the specified category (i.e. the basket in question) at a particular time, *t*, during the Relevant Year;

n is as defined in paragraph **(b)**;

R_i is as defined in paragraph **(b)**;

$p_{0,i}$ is as defined in paragraph **(b)**; and

$p_{t,i}$ is as defined in paragraph **(b)**.

(d) Subject to paragraphs **(e)** and **(f)**, the Controlling Percentage in relation to any Relevant Year means for the TI Basket specified in paragraph **(a)**, RPI increased by [X][114] percentage points.

Calculation of Carry Forward Percentage

(e) Where the Percentage Change in any Relevant Year is less than the Controlling Percentage, then for the purpose of the TI Basket specified in paragraph **(a)** the Controlling Percentage for the following Relevant Year shall be determined in accordance with paragraph **(d)**, but increased by the amount of such deficiency.

(f) Where the Percentage Change in any Relevant Year is more than the Controlling Percentage, then for the purpose the TI Basket specified in paragraph **(a)** the Controlling Percentage for the following Relevant Year shall be determined in accordance with paragraph **(d)**, but decreased by the amount of such excess.

Controls of sub-baskets

(g) In the case of the TI Mobile Services Sub-basket, the Dominant Provider shall also and, in any event, take all reasonable steps to secure that, at the end of each Relevant Year, the Percentage Change in the aggregate of charges for all of the products and services of the TI Mobile Services Sub-basket is not more than RPI increased by 3.25[115] percentage points.

[114] [*Ofcom is consulting on the appropriate value of X within a range of 0% and 6.5%, as discussed in Section 5 of the consultation document attached to this Notification*]
[115] [*Provisional value based on the midpoint of our consultation range for the value of X in paragraph **(d)***]

For the purpose of this paragraph **(g)**, the Percentage Change shall be calculated by employing the formula set out in paragraph **(c)**.

(h) In the case of the TI POH Sub-basket, the Dominant Provider shall also and, in any event, take all reasonable steps to secure that, at the end of each Relevant Year, the Percentage Change in the aggregate of charges for all of the products and services of the TI POH Sub-basket is not more than RPI reduced by 0 percentage points.

For the purpose of this paragraph **(h)**, the Percentage Change shall be calculated by employing the formula set out in paragraph **(c)**.

Controls of sub-caps

(i) In the case of the TI Ancillary, Equipment and Infrastructure Sub-cap Services, the Dominant Provider shall also and, in any event, take all reasonable steps to secure that, during each Relevant Year, the Percentage Change in each of the charges for each and every TI Ancillary, Equipment and Infrastructure Service is not more than RPI increased by 3.25[116] percentage points.

For the purpose of this paragraph **(i)**, the Percentage Change shall be calculated by employing the formula set out in paragraph **(k)**.

(j) In the case of the TI All Other Sub-cap Services, the Dominant Provider shall also and, in any event, take all reasonable steps to secure that, during each Relevant Year, the Percentage Change in each of the charges for each and every TI All Other Service is not more than RPI increased by 10[117] percentage points.

For the purpose of this paragraph **(j)**, the Percentage Change shall be calculated by employing the formula set out in paragraph **(k)**.

(k) The Percentage Change for the purpose of:

i. the TI Ancillary, Equipment and Infrastructure Sub-cap Services; and
ii. the TI All Other Sub-cap Services,

shall be calculated by employing the following formula:

$$C_t = \frac{(p_t - p_0)}{p_0}$$

where:

C_t is the Percentage Change in charges for the products and services in the sub-basket in question at a particular time *t* during the Relevant Year;

p_0 save for the First Relevant Year of the control, is the published charge made by the Dominant Provider for the specific product or service, *i*, at the beginning of the Relevant Year excluding any discounts offered by the Dominant Provider; and

[116] [*Provisional value based on the midpoint of our consultation range for the value of X in paragraph **(d)***]
[117] [*Provisional value based on the midpoint of our consultation range for the value of X in paragraph **(d)***]

p_t is the published charge made by the Dominant Provider for the specific product or service prevailing at the time, *t*, during the Relevant Year excluding any discounts offered by the Dominant Provider.

General provisions and interpretation

(l) Where the Dominant Provider makes a material change (other than to a charge) to any product or service which is subject to this Condition 5.1 or to the date on which its financial year ends or there is a material change in the basis of the Retail Prices Index, paragraphs **(a)** to **(k)** shall have effect subject to such reasonable adjustment to take account of the change as Ofcom may direct to be appropriate in the circumstances.

For the purposes of this paragraph, a material change to any product or service which is subject to this Condition 5.1 includes the introduction of a new product or service wholly or substantially in substitution for that existing product or service.

(m) The Dominant Provider shall record, maintain and supply to Ofcom in an electronic format, no later than three months after the end of each Relevant Year, the data necessary for Ofcom to monitor compliance of the Dominant Provider with the price control by performing the calculation of the Percentage Change. The data shall include:

i. pursuant to paragraph **(a)**, the calculated percentage change relating to the aggregate of charges for all of the products and services in the TI Basket;

ii. pursuant to paragraph **(b)**, calculation of the revenue accrued as a result of all relevant individual charge charges during any Relevant Year compared to the target revenue change;

iii. all relevant data the Dominant Provider used in the calculation of the percentage change, C_t, pursuant to paragraph **(c)**, including for each specific product or service, *i:*

iv. all relevant revenues accrued during the Relevant Financial Year in respect of the specific product or service;

v. published charges made by the Dominant Provider at time, *t*, during the Relevant Year excluding any discounts offered by the Dominant Provider;

vi. the relevant published charges at the start of the Relevant Year;

vii. other data necessary for monitoring compliance with the charge control.

(n) Paragraphs **(a)** to **(m)** shall not apply to such extent as Ofcom may direct.

(o) The Dominant Provider shall comply with any direction Ofcom may make from time to time under this Condition 5.1.

Annex to Condition 5.1

Products and services subject to charge control pursuant to Condition 5.1

Section 1

Meaning of "TI Mobile Services Sub-basket"

For the purpose of Condition 5.1, the expression "**TI Mobile Services Sub-basket**" shall be construed as including the following products and/or services, subject to such changes as Ofcom may direct from time to time following any proposal by the Dominant Provider to introduce a new product and/or service or withdraw or substitute one or more of these products and/or services for another (in which case this list shall be construed accordingly):

Radio Base Station Backhaul – Circuit Connection Charges and Cell Site Infrastructure

Connection of a New Circuit

- 128Kbit/s – 960Kbit/s
- 2Mbit/s
- 2Mbit/s Subsequent

New Circuit on Spare Capacity

- 2Mbit/s

Subsequent 8Mbit/s Package

- 8Mbit/s Subsequent Package

Radio Base Station Backhaul – Circuit Rental Charges[118]**]**

Radio Base Station Backhaul -Annual Circuit Rentals for the following distances: metro, 0 - 15 km, 16 - 35 km, 36 - 75 km, 76 - 150 km, 151 - 300 km and 301 km+

- 128 Kbit/s (new)
- 192 Kbit/s (new)
- 256 Kbit/s (new)
- 320 Kbit/s (new)
- 384 Kbit/s (new)
- 448 Kbit/s (new)
- 512 Kbit/s (new)
- 576 Kbit/s (new)
- 640 Kbit/s (new)
- 704 Kbit/s (new)

[118] These charges correspond to the Carrier Price List, Section B11, Part 11.03

- 768 Kbit/s (new)
- 832 Kbit/s (new)
- 896 Kbit/s (new)
- 960 Kbit/s (new)
- 1024 Kbit/s (new)
- 2048kbit/s (new)
- 8Mbit/s package (new)
- 8Mbit/s Subsequent package (new)

Radio Base Station Backhaul Assured Resilience

- 128Kbit/s to 960Kbit/s Full Man Link/ End to End Diversity per circuit
- 128Kbit/s to 960Kbit/s Basic Diversity per circuit
- 2Mbit/s Full Main Link/ End to End Diversity per circuit
- 2Mbit/s Basic Diversity per circuit

Multiple Diversity Monitoring

- Annual monitoring charge per circuit 128Kbit/s to 960Kbit/s and 2Mbit/s only

NetStream[119]

NetStream 16 Longline

- Hub Buyout charge (per site)
- Small Satellite Site
- Small Satellite Site (existing MegaStream in situ)
- Large Satellite Site
- Large Satellite Site (existing MegaStream 34 & above in situ)
- one-off fee to configure 155Mbit/s circuit as 63x2Mbit/s
- Connection charge per Longline 2 Mbit/s circuit
- Connection charge per Longline 34/45 Mbit/s circuit
- Connection charge per Longline 155 Mbit/s circuit

Annual rental for the following distances: metro, 0 - 15 km, 16 - 75 km, 76 - 300 km and 301 km+

- small satellite site to serving exchange (2 Mbit/s)
- large satellite site to serving exchange (34/45 Mbit/s)
- large satellite site to serving exchange (155 Mbit/s)

[119] These charges correspond to the Carrier Price List, Section 57 subpart 3

SiteConnect[120]

Major site linkage charge

- Major Site Linkage Connection Charge - where infrastructure does not exist (per Site)
- Major Site Linkage Connection Charge where infrastructure exists (per site)
- Major Site Linkage Rental Charge (per site)

Remote site linkage charge

- Remote Site Linkage Charge
- Subsequent Remote Site Linkage Charge

Subsequent remote site linkage charge (three year option)

- 3 Year Option – year 1
- 3 Year Option – year 2
- 3 Year Option – year 3

Bandwidth charge

- 2 Mbit/s bandwidth charge (up to 75 km)
- 2 Mbit/s bandwidth charge (76 to 125 km)
- 2 Mbit/s bandwidth charge (126 to 200 km)
- 2 Mbit/s bandwidth charge (201 to 300 km)
- 2 Mbit/s bandwidth charge (301 km +)

8 Mbit/s bandwidth charge

- 8 Mbit/s bandwidth charge (up to 75 km)
- 8 Mbit/s bandwidth charge (76 to 125 km)
- 8 Mbit/s bandwidth charge (126 to 200 km)
- 8 Mbit/s bandwidth charge (201 to 300 km)
- 8 Mbit/s bandwidth charge (301 km +)

155 Mbit/s circuit linkage charge

- Circuit connection charge per 155Mbit/s
- New SMA-1 (or equivalent) at site
- New SMA-4 (or equivalent) at site
- New circuit on spare tributary on existing infrastructure outside SiteConnect contract per 155 Mbit/s

[120] These charges correspond to the Carrier Price List, Section B12, Part 12.01

155 Mbit/s bandwidth charge

- Metro (currently London only)
- 0 – 15 km
- 16 - 35 km
- 36 - 75 km
- 76 - 150 km
- 151 - 300 km
- 300+ km

Section 2

Meaning of "TI POH Sub-basket"

For the purpose of Condition 5.1, the expression "**TI POH Sub-basket**" shall be construed as including the following products and/or services, subject to such changes as Ofcom may direct from time to time following any proposal by the Dominant Provider to introduce a new product and/or service or withdraw or substitute one or more of these products and/or services for another (in which case this list shall be construed accordingly):

Partial Private Circuits – Point of Handover[121]

CSH Configuration SMA-16 connection and rental

- SMA-16 ADM with no trib interfaces (single fibre working) - existing site
- SMA-16 ADM with no trib interfaces (dual fibre working 1300nm) - existing site
- SMA-16 ADM with no trib interfaces (dual fibre working 1550nm) - existing site
- SMA-16 ADM with no trib interfaces (dual fibre working 1300 + 1550nm) - existing site
- SMA-16 ADM with no trib interfaces (Single Fibre Working + dual fibre working 1300nm) - existing site
- SMA-16 ADM with no trib interfaces (Single Fibre Working + dual fibre working 1550nm) - existing site
- Protected Path enabled SMA-16 ADM with no trib interfaces (single fibre working) - existing site.
- Protected Path enabled SMA-16 ADM with no trib interfaces (dual fibre working 1300nm) - existing site.
- Protected Path enabled SMA-16 ADM with no trib interfaces (dual fibre working 1500nm) - existing site.
- STM-1 electrical trib interface (2 ports)
- STM-1 optical (1300nm) trib interface (1 port)
- STM-1 electrical trib card (2 ports), required for 1+1 card protection

[121] These charges correspond to the Carrier Price List, Section B8, Part 8.01

- STM-1 optical (1300nm) trib card (1 port), required for MSP protection
- STM-4 optical (1300nm) trib interface (1 port)
- STM-4 optical (1300nm) trib card (1 port), required for MSP protection
- STM-1 optical (1300nm) trib interface (2 port)
- STM-1 optical (1300nm) trib card (2 port), required for MSP protection
- STM-1 electrical trib interface (4 port)
- STM-1 electrical trib interface (4 port) required for 1+1 card protection, can be used for MSP 1+1 Protection
- STM-1 optical (1300nm) trib interface (4 port)
- STM-1 optical (1300nm) trib card (4 port), required for MSP protection

CSH Configuration SMA-4 connection and rental

- SMA-4 ADM with no trib interfaces (single fibre working) - existing site
- SMA-4 ADM with no trib interfaces (dual fibre working 1300nm) - existing site
- SMA-4 ADM with no trib interfaces (dual fibre working 1550nm) - existing site
- SMA-4 ADM with no trib interfaces (dual fibre working 1300 + 1550nm) - existing site
- SMA-4 ADM with no trib interfaces (Single Fibre Working + dual fibre working 1300nm) - existing site
- SMA-4 ADM with no trib interfaces (Single Fibre Working + dual fibre working 1550nm) - existing site
- Protected Path enabled SMA-4 ADM with no trib interfaces (single fibre working) - existing site
- Protected Path enabled SMA-4 ADM with no trib interfaces (dual fibre working 1300nm) - existing site
- Protected Path enabled SMA-4 ADM with no trib interfaces (dual fibre working 1500nm) - existing site
- STM-1 electrical trib interface (1 port)
- STM-1 optical (1300nm) trib interface (1 port)
- STM-1 electrical trib card (1 port), required for 1+1 card protection
- STM-1 optical (1300nm) trib card (1 port), required for MSP protection
- STM-4 optical (1300nm) trib interface (1 port)
- STM-4 optical (1300nm) trib card (1 port), required for MSP protection
- STM-1 optical (1300nm) trib interface (2 port)
- STM-1 optical (1300nm) trib card (2 port), required for MSP protection
- STM-1 electrical trib interface (2 port)

- STM-1 electrical trib interface (2 port), required for 1+1 card protection, can be used for MSP 1+1 Protection
- STM-1 electrical trib interface (4 port)
- STM-1 electrical trib interface (4 port) required for 1+1 card protection, can be used for MSP 1+1 Protection
- STM-1 optical (1300nm) trib interface (4 port)
- STM-1 optical (1300nm) trib card (4 port), required for MSP protection

CSH Configuration SMA-1 connection and rental

- SMA-1ADM with no trib interfaces (single fibre working) - existing site
- SMA-1 ADM with no trib interfaces (dual fibre working 1300nm) - existing site
- SMA-1 ADM with no trib interfaces (dual fibre working 1550nm) - existing site
- SMA-1 ADM with no trib interfaces (dual fibre working 1300+1550nm) - existing site
- SMA-1 ADM with no trib interfaces (single fibre working + dual fibre working 1300nm) - existing site
- SMA-1 ADM with no trib interfaces (single fibre working + dual fibre working 1550nm) - existing site
- Protected Path enabled SMA-1 ADM with no trib interfaces (single fibre working) - existing site
- Protected Path enabled SMA-1 ADM with no trib interfaces (dual fibre working 1300nm) - existing site
- Protected Path enabled SMA-1 ADM with no trib interfaces (dual fibre working 1550nm) - existing site
- Protected Path enabled SMA-1 ADM with no trib interfaces (single fibre + dual fibre working 1300nm) - existing site
- Protected Path enabled SMA-1 ADM with no trib interfaces (single fibre + dual fibre working 1550nm) - existing site
- Protected Path enabled SMA-1 ADM with no trib interfaces (dual fibre working 1300nm +1550nm) - existing site
- STM-1 electrical trib interface (1 port)
- STM-1 optical (1300nm) trib interface (1 port)
- STM-1 electrical trib card (1 port), required for 1+1 card protection
- STM-1 optical (1300nm) trib card (1 port), required for MSP protection

CSH Configuration MSH51 connection and rental

- MSH51 ADM with no trib interfaces (single fibre working) - existing site

- MSH51 ADM with no trib interfaces (dual fibre working 1300nm) - existing site
- MSH51 ADM with no trib interfaces (dual fibre working 1550nm) - existing site
- MSH51c ADM with no trib interfaces (dual fibre working 1300 + 1550nm) - existing site
- MSH51c ADM with no trib interfaces (Single Fibre Working + dual fibre working 1300nm) - existing site
- MSH51c ADM with no trib interfaces (Single Fibre Working + dual fibre working 1550nm) - existing site
- Per km from serving exchange to MSH node - single fibre working
- Per km from serving exchange to MSH node - dual fibre working
- STM-1 electrical trib interface (4 ports)
- STM-1 optical (1300nm) trib interface (2 ports)
- STM-1 electrical trib card (4 ports), required for 1+1 card protection
- STM-1 optical (1300nm) trib card (2 ports), required for MSP protection
- STM-4 optical (1300nm) trib interface (1 port)
- STM-4 optical (1300nm) Trib card (1 port), required for MSP protection

ISH Configuration SMA-16 connection and rental

- SMA –16 ADM with single STM-16 handover (1300nm)
- Optional STM-16 1550nm handover

ISH Configuration SMA-4 connection and rental

- SMA-4 ADM with single STM-4 handover (1300nm)
- Optional STM-4 1550nm handover
- SMA-4 ADM with single STM-1 handover (1300nm)
- Additional cost for STM-1 1550nm handover
- Additional STM-1 handovers (1300nm) – max 3
- Additional STM-1 handovers (1550nm) – max 3

ISH Configuration SMA-1 connection and rental

- SMA-1 ADM with single STM-1 Handover (1300nm)
- SMA-1 ADM with Single STM-1 handover (1550nm)

ISH Configuration MSH51 connection and rental

- MSH51 ADM with single STM-16 handover (1300nm)
- Optional STM-16 1550nm handover

Re-Designation and Grandfathering Charges for Customer Sited Handover rental

- CSH Re-Designated SMA-16 ADM
- CSH Re-Designated SMA-4 ADM
- CSH Re-Designated SMA-1 ADM
- CSH Re-Designated MSH-51 ADM
- Grandfathered SMA- 1 – legacy equipment
- Grandfathered 16x2 – legacy equipment
- Grandfathered 4x2 – legacy equipment

ISH Extension Configuration STM-16 connection and rental

- SMA –16 ADM with single STM-16 handover (1300nm)
- Optional STM-16 1550nm handover

ISH Extension Configuration STM-4 connection and rental

- SMA-4 ADM with single STM-4 handover (1300nm)
- Optional STM-4 1550nm handover
- SMA-4 ADM with single STM-1 handover (1300nm)
- Optional STM-1 1550nm handover
- Additional STM-1 handovers (1300nm) – max 3
- Additional STM-1 handovers (1550nm) – max 3

ISH Extension Configuration STM-1 connection and rental

- SMA-1 ADM with single STM – 1 handover (1300nm)

ISH Extension Configuration MSH51 connection and rental

- MSH51 ADM with single STM-16 handover (1300nm)
- Optional STM-16 1550nm handover

Miscellaneous Generic Equipment

- Additional charge for new site connection and rental
- Standby batteries if required connection and rental
- 2M Bearer Access - required for access to DPCN connection and rental
- Plus rental per km from POH BT Serving Node to DPCN node rental

POH Rental Charges

- SMA-1
- SMA-4
- SMA-16
- Bearer

Circuit Rental/Maintenance[122]

For 3rd party POH rental fixed charge per annum

- 2.4k-64k
- 128k
- 192k
- 256k
- 320k
- 384k
- 448k
- 512k
- 576k
- 640k
- 704k
- 768k
- 832k
- 896k
- 960k
- 1024
- 1M
- 2M
- 34/45M
- 140/155M

Partial Private Circuit 155 MSH – MSH

- 3rd party PoH rental fixed charge p.a.

Protected Path Variant 1 and 2 Rental – 2M, 34/45M and 140/155M

- 3rd party PoH rental fixed charge p.a.

In Span Handover/In Span Handover Extension Single Fibre / Dual Fibre Working (SFW/DFW)[123]

[122] These charges correspond to the Carrier Price List, Section B8, Part 8.03
[123] These charges correspond to the Carrier Price List, Section B8, Part 8.06

Equipment Charges:

- STM1 – Single Wavelength
- STM4/STM16 – Dual Wavelength

Radio Base Station Backhaul – Point of Connection[124]

CSC Configuration SMA-16 connection and rental

- SMA-16 ADM with no trib interfaces (single fibre working) - existing site
- SMA-16 ADM with no trib interfaces (dual fibre working 1300nm) – existing site
- SMA-16 ADM with no trib interfaces (dual fibre working 1550nm) – existing site
- SMA-16 ADM with no trib interfaces (dual fibre working 1300 + 1550nm) - existing site
- SMA-16 ADM with no trib interfaces (Single Fibre Working + dual fibre working 1300nm) - existing site
- SMA-16 ADM with no trib interfaces (Single Fibre Working + dual fibre working 1550nm) - existing site
- Additional charge for new site
- Standby batteries if required
- STM-1 electrical trib interface (2 ports)
- STM-1 optical (1300nm) trib interface (1 port)
- STM-1 electrical trib card (2 ports), required for 1+1 card protection
- STM-1 optical (1300nm) trib card (1 port), required for MSP protection
- STM-4 optical (1300nm) trib interface (1 port)
- STM-4 optical (1300nm) trib card (1 port), required for MSP protection
- STM-1 optical (1300nm) trib interface (2 port)
- STM-1 optical (1300nm) trib card (2 port), required for MSP protection
- STM-1 electrical trib interface (4 port)
- STM-1 electrical trib interface (4 port) required for 1+1 card protection, can be used for MSP 1+1 Protection
- STM-1 optical (1300nm) trib interface (4 port)
- STM-1 optical (1300nm) trib card (4 port), required for MSP protection

CSC Configuration SMA-4 connection and rental

- SMA-4 ADM with no trib interfaces (single fibre working) - existing site
- SMA-4 ADM with no trib interfaces (dual fibre working 1300nm) - existing site

[124] These charges correspond to the Carrier Price List, Section B11, Part 11.01.1

- SMA-4 ADM with no trib interfaces (dual fibre working 1550nm) - existing site
- SMA-4 ADM with no trib interfaces (dual fibre working 1300 + 1550nm) - existing site
- SMA-4 ADM with no trib interfaces (Single Fibre Working + dual fibre working 1300nm) - existing site
- SMA-4 ADM with no trib interfaces (Single Fibre Working + dual fibre working 1550nm) - existing site
- Additional charge for new site
- Standby batteries if required
- STM-1 electrical trib interface (1 port)
- STM-1 optical (1300nm) trib interface (1 port)
- STM-1 electrical trib card (1 port), required for 1+1 card protection
- STM-1 optical (1300nm) trib card (1 port), required for MSP protection
- STM-4 optical (1300nm) trib interface (1 port)
- STM-4 optical (1300nm) trib card (1 port), required for MSP protection
- STM-1 optical (1300nm) trib interface (2 port)
- STM-1 optical (1300nm) trib card (2 port), required for MSP protection
- STM-1 electrical trib interface (2 port)
- STM-1 electrical trib interface (2 port), required for 1+1 card protection, can be used for MSP 1+1 Protection
- STM-1 electrical trib interface (4 port)
- STM-1 electrical trib interface (4 port) required for 1+1 card protection, can be used for MSP 1+1 Protection
- STM-1 optical (1300nm) trib interface (4 port)
- STM-1 optical (1300nm) trib card (4 port), required for MSP protection

CSC Configuration SMA-1 connection and rental

- SMA-1ADM with no trib interfaces (single fibre working) - existing site
- SMA-1 ADM with no trib interfaces (dual fibre working 1300nm) - existing site
- SMA-1 ADM with no trib interfaces (dual fibre working 1550nm) - existing site
- SMA-1 ADM with no trib interfaces (dual fibre working 1300+1550nm) – existing site
- SMA-1 ADM with no trib interfaces (single fibre working + dual fibre working 1300nm) - existing site
- SMA-1 ADM with no trib interfaces (single fibre working + dual fibre working 1550nm) - existing site
- Additional charge for new site
- Standby batteries if required

- STM-1 electrical trib interface (1 port)
- STM-1 optical (1300nm) trib interface (1 port)
- STM-1 electrical trib card (1 port), required for 1+1 card protection
- STM-1 optical (1300nm) trib card (1 port), required for MSP protection

CSC Configuration MSH51

- MSH51 ADM with no trib interfaces (single fibre working) - existing site rental
- MSH51 ADM with no trib interfaces (dual fibre working 1300nm) - existing site rental
- MSH51 ADM with no trib interfaces (dual fibre working 1550nm) - existing site rental
- Per km from serving exchange to MSH node - single fibre working rental
- Per km from serving exchange to MSH node - dual fibre working rental
- Standby batteries if required connection and rental
- STM-1 electrical trib interface (4 ports) connection and rental
- STM-1 optical (1300nm) trib interface (2 ports) connection and rental
- STM-1 electrical trib card (4 ports), required for 1+1 card protection connection and rental
- STM-1 optical (1300nm) trib card (2 ports), required for MSP protection connection and rental
- STM-4 optical (1300nm) trib interface (1 port) connection and rental
- STM-4 optical (1300nm) Trib card (1 port), required for MSP protection connection and rental

Provision of STM1 Radio Access system at CSC

- SMA-1 ADM with no trib interfaces - (dual fibre working 1300nm) connection
- SMA-1 ADM with no trib interfaces - (dual fibre working 1300 +1500nm) connection
- SMA-1 ADM with no trib interfaces - (single fibre working + dual fibre working 1300nm) connection

2Mbit/s Bearer Access - required for access to DPCN connection and rental

- 2Mbit/s Bearer from POC BT Serving Node to DPCN Node

ISH Configuration SMA-16 connection and rental

- SMA –16 ADM with single STM-16 handover (1300nm)
- Optional STM-16 1550nm handover

ISH Configuration SMA-4 connection and rental

- SMA-4 ADM with single STM-4 handover (1300nm)
- Optional STM-4 1550nm handover
- SMA-4 ADM with single STM-1 handover (1300nm)
- Additional cost for STM-1 1550nm handover
- Additional STM-1 handovers (1300nm) – max 3
- Additional STM-1 handovers (1550nm) – max 3

ISH Configuration SMA-1 connection and rental

- SMA-1 ADM with single STM-1 Handover (1300nm)
- SMA-1 ADM with Single STM-1 handover (1550nm)

In Span Handover (ISH) Extension (in addition to above charges) connection and rental

- ISH Extension for all ADM Configurations

Grandfathering Charges for Customer Sited Connection

Customer Sited Connection (CSC) rental

- Grandfathered SMA-16 ADM
- Grandfathered SMA-4 ADM
- Grandfathered SMA-1 ADM
- Grandfathered MSH51ADM
- Grandfathered 16 x 2
- Grandfathered 4 x 2

Section 3

Meaning of "TI Ancillary Equipment and Infrastructure Sub-cap Services"

For the purpose of Condition 5.1, the expression "**TI Ancillary Equipment and Infrastructure Sub-cap Services**" shall be construed as including the following products and/or services, subject to such changes as Ofcom may direct from time to time following any proposal by the Dominant Provider to introduce a new product and/or service or withdraw or substitute one or more of these products and/or services for another (in which case this list shall be construed accordingly):

Connection of a new 'protected path variant two' circuit single charge[125]

- Protected Path Variant Two 2Mbit/s

[125] These charges correspond to the Carrier Price List, Section B8, Part 8.02

- Protected Path Variant Two 34Mbit/s - 45Mbit/s
- Protected Path Variant Two 140Mbit/s - 155Mbit/s

Third party customer link infrastructure single charge

- NTU 64k – 256k on existing copper
- NTU 64k – 256k on new copper
- NTU 320k – 640k on existing copper
- NTU 320k – 640k on new copper
- NTU 128k – 640k on2Mbit infrastructure
- NTU 704k – 960k all delivery options
- 1Mbit/s circuit on existing copper
- 1Mbit/s circuit on new copper
- 2Mbit/s circuit delivered by HDSL on existing copper
- 2Mbit/s circuit delivered by HDSL on new copper
- Provide a 2Mbit/s 4x2 at existing fibre sites
- Provide a 2Mbit/s 16x2 at existing fibre sites
- Subsequent 2Mbit/s circuit on existing PPC 4x2 or 16x2
- 34/45Mbit/s ASDH NTE at existing fibre sites
- 34/45Mbit/s ASDH NTE Expansion Unit
- Additional charge to provide new fibre infrastructure at a new site

Third party customer sited SMA-16 ADM single charge

- SMA-16 with no trib interfaces (single fibre working) – existing site
- SMA-16 with no trib interfaces (dual fibre working 1300nm) – existing site
- SMA-16 with no trib interfaces (dual fibre working 1500nm) – existing site
- Protected Path enabled SMA-16 with no trib interfaces (single fibre working) – existing site
- Protected Path enabled SMA-16 with no trib interfaces (dual fibre working 1300nm) – existing site
- Protected Path enabled SMA-16 with no trib interfaces (dual fibre working 1500nm) – existing site
- 2Mbit/s trib cards (32 ports)
- 34Mbit/s trib card (3 ports)
- 45Mbit/s trib card (3 ports)
- STM-1 electrical trib card (2 ports)
- STM-1 optical (1300nm) trib card (1 port)

- 140Mbit/s electrical trib card (1 port)
- STM-4 optical (1300nm) trib card (1 port)

Third party customer sited SMA-4 ADM single charge

- SMA-4 with no trib interfaces (single fibre working) – existing site
- SMA-4 with no trib interfaces (dual fibre working 1300nm) – existing site
- SMA-4 with no trib interfaces (dual fibre working 1500nm) – existing site
- Protected Path enabled SMA-4 with no trib interfaces (single fibre working) – existing site
- Protected Path enabled SMA-4 with no trib interfaces (dual fibre working 1300nm) – existing site
- Protected Path enabled SMA-4 with no trib interfaces (dual fibre working 1500nm) – existing site
- 2Mbit/s trib cards (32 ports)
- 34Mbit/s trib card (3 ports)
- 45Mbit/s trib card (3 ports)
- STM-1 electrical trib card (1 port)
- STM-1 optical (1300nm) trib card (1 port)
- 140Mbit/s electrical trib card (1 port)
- STM-4 optical (1300nm) trib card (1 port)

Third party customer sited SMA-1 ADM single charge

- SMA-1 with no trib interfaces (single fibre working) – existing site
- SMA-1 with no trib interfaces (dual fibre working 1300nm) – existing site
- SMA-1 with no trib interfaces (dual fibre working 1500nm) – existing site
- Protected Path enabled SMA-1 with no trib interfaces (single fibre working) – existing site
- Protected Path enabled SMA-1 with no trib interfaces (dual fibre working 1300nm) – existing site
- Protected Path enabled SMA-1 with no trib interfaces (dual fibre working 1500nm) – existing site
- 2Mbit/s trib cards (32 ports)
- 2Mbit/s trib cards (16 ports)
- 34Mbit/s trib card (3 ports)
- 45Mbit/s trib card (3 ports)
- STM-1 electrical trib card (1 port)

- STM-1 optical (1300nm) trib card (1 port)
- 140Mbit/s electrical trib card (1 port)

Third party customer sited MSH-51C ADM single charge

- MSH51 with no trib interfaces (single fibre working) – existing site
- MSH51 with no trib interfaces (dual fibre working 1300nm) – existing site
- MSH51 with no trib interfaces (dual fibre working 1500nm) – existing site
- Per km from serving exchange to MSH node – single fibre working
- Per km from serving exchange to MSH node – dual fibre working
- STM-1 electrical trib card (4 ports)
- STM-1 optical (1300nm) trib card (2 ports)
- 140Mbit/s electrical trib card (1 port)
- STM-4 optical (1300nm) trib card (1 port)

Miscellaneous generic equipment connection and rental

- Additional charge for new site
- Standby batteries if required
- Radio site share

Protected Path Variant 1 and 2 Rental – for 2M, 34/45M and 140/155M[126]

- Local end fixed charge p.a. (3rd party customer link)
- Main link fixed charge p.a.
- Terminating segment charge per km p.a.
- Regional trunk segment charge per km p.a.

Assured Resilience

Annual monitoring charge for Full Diversity End to End and Main Link and Basic Diversity

- 64K
- 128K to 960K
- 1Mbit/s and 2Mbit/s

Multiple Resilience Monitoring

Annual monitoring charge

- Charge per circuit 64K, 128K to 960K, 1Mbit/s and 2Mbit/s only

Partial Private Circuits - Migration & Infrastructure Tariff Conversion[127]

[126] These charges correspond to the Carrier Price List, Section B8, Part 8.03

Circuit Migration Charges

- Successful Circuit Migration to PPC 2.4Kbit/s –155Mbit/s
- Failed Circuit Migration to PPC 2.4Kbit/s – 155Mbit/s

Infrastructure Tariff Conversions

Charges for BT Retail Private Circuits Installed up to and including 31st December 2001

- All bandwidths

Charges for BT Retail Private Circuits Installed after 31st December 2001

- 2.4-960kbit/s 1 month or under
- 2.4-960kbit/s 2 months
- 2.4-960kbit/s 3 months and over
- 1 Mbit Any age
- 2Mbit/s Any age
- 34 & 45Mbit/s 1 month or under
- 34 & 45Mbit/s 2 months
- 34 & 45Mbit/s 3 months
- 34 & 45Mbit/s 4 months
- 34 & 45Mbit/s 5 months
- 34 & 45Mbit/s 6 months
- 34 & 45Mbit/s 7 months
- 34 & 45Mbit/s 8 months
- 34 & 45Mbit/s 9 months and over
- 140 – 155Mbit/s Up to 1 month
- 140 – 155Mbit/s 2 months
- 140 – 155Mbit/s 3 months
- 140 – 155Mbit/s 4 months
- 140 – 155Mbit/s 5 months
- 140 – 155Mbit/s 6 months
- 140 – 155Mbit/s 7 months
- 140 – 155Mbit/s 8 months
- 140 – 155Mbit/s 9 months
- 140 – 155Mbit/s 10 months
- 140 – 155Mbit/s 11 months

[127] These charges correspond to the Carrier Price List, Section B8, Part 8.04

- 140 – 155Mbit/s 12 months
- 140 – 155Mbit/s 13 months
- 140 – 155Mbit/s 14 months
- 140 – 155Mbit/s 15 months
- 140 – 155Mbit/s 16 months
- 140 – 155Mbit/s 17 months
- 140 – 155Mbit/s 18 months
- 140 – 155Mbit/s 19 months
- 140 – 155Mbit/s 20 months
- 140 – 155Mbit/s 21 months
- 140 – 155Mbit/s 22 months
- 140 – 155Mbit/s 23 months
- 140 – 155Mbit/s 24 months
- 140 – 155Mbit/s 25 months
- 140 – 155Mbit/s 26 months
- 140 – 155Mbit/s 27 months
- 140 – 155Mbit/s 28 months
- 140 – 155Mbit/s 29 months
- 140 – 155Mbit/s 30 months
- 140 – 155Mbit/s 31 months
- 140 – 155Mbit/s 32 months
- 140 – 155Mbit/s 33 months
- 140 – 155Mbit/s 34 months
- 140 – 155Mbit/s 35 months
- 140 – 155Mbit/s 36 months
- 140 – 155Mbit/s 37 months
- 140 – 155Mbit/s 38 months
- 140 – 155Mbit/s 39 months
- 140 – 155Mbit/s 40 months
- 140 – 155Mbit/s 41 months
- 140 – 155Mbit/s 42 months and over

Partial Private Circuits – Third Party Customer Sited Equipment Re-use[128]

- Deferred Use Set Up Charge

[128] These charges correspond to the Carrier Price List, Section B8, Part 8.05

- Managed Handover Set Up Charge
- Managed Handover Administration Charge

Partial Private Circuits - Other Charges[129]

Bandwidth Upgrade and Change of Interface Presentation Charges

Change of speed within 320Kbit/s – 1024Kbit/s bandwidths in increments of 64Kbit/s at the Third Party premises:

- 1Mbit

Bandwidth Upgrades:

- 2.4Kbit/s – 64Kbit/s
- 64Kbit/s up to 155Mbit/s

Change of Interface

- 64Kbit/s up to 155Mbit/s

Third Party Internal and External Moves

Internal Move of a circuit at the Third Party premises within the same BT serving exchange area (64 Kbit/s- 2Mbit/s only)

- 64 Kbit/s – 2 Mbit/s (Mon – Fri standard working hours)
- 64 Kbit/s – 2 Mbit/s (Monday – Friday Out of Hours; Saturdays & Sundays)
- 64 Kbit/s – 2 Mbit/s (Public/Bank Holiday)

Internal Move of a circuit at the Third Party premises in a different BT serving exchange area (64 Kbit/s to 2 Mbit/s only)

- 64 Kbit/s – 2 Mbit/s (Mon – Fri standard working hours)
- 64 Kbit/s – 2 Mbit/s (Monday – Friday Out of Hours; Saturdays & Sundays)
- 64 Kbit/s – 2 Mbit/s (Public/Bank Holiday)

External Move of a Circuit to another Third Party premises within the same BT serving Exchange Area

- 64 Kbit/s – 2 Mbit/s (Mon – Fri standard working hours)
- 64 Kbit/s – 2 Mbit/s (Monday – Friday Out of Hours; Saturdays & Sundays)

[129] These charges correspond to the Carrier Price List, Section B8, Part 8.06

- 64 Kbit/s – 2 Mbit/s (Public/Bank Holiday)
- 34 - 155Mbit/s Mon – Fri standard working hours
- 34 - 155Mbit/s Monday – Friday Out of Hours; Saturdays & Sundays
- 34 - 155Mbit/s Public/Bank Holiday

External Move of a Circuit to another Third Party premises in a different BT serving Exchange Area

- All bandwidths Mon – Fri (Standard Working Hours), full Connection charge applies as shown in section B8.2

Point of Handover (PoH) Internal and External Moves (within the Same Exchange Area or to a Different Exchange Area)

Internal & External Moves: 1M/bits – 155Mbit/s Circuits & 2M/bits Access Bearer

- Move Charge Per Circuit (Mon – Fri standard working hours)
- Move Charge Per Circuit (Monday – Friday Out of Hours; Saturdays & Sundays)
- Move Charge Per Circuit (Public/Bank Holiday)

Internal & External Moves: Circuits on 2M/bits Access Bearer (64Kit/s – 960Kbit/s)

- Move Charge Per Circuit (Mon – Fri standard working hours)
- Move Charge Per Circuit (Monday – Friday Out of Hours; Saturdays & Sundays)
- Move Charge Per Circuit (Public/Bank Holiday)

Pre Order Survey Charge – normal working hours

- All Bandwidths

Visit and Time Related Charges

- As required

Excess Construction Charges (ECC)

- As per Openreach ECCs except for radio ECCs below
    - Customer Cabinet
    - Radio Monopole
    - Elevated Platform Usage (charge per day)

Cancellation Charges

Cancellation charges for circuits a requisite period of 10 working days

- % of connection charge related to number of working days before committed delivery

Cancellation charges for circuits with a requisite period of 30 working days

- % of connection charge related to number of working days before committed delivery

Cancellation charges for all other circuits & PoH ISH and CSH Infrastructures

- % of connection charge related to number of working days before committed delivery

Cancellation charges to be applied to all Third Party Link Infrastructures for wideband delivered circuits

- Copper NTE (New and existing)
- Fibre 4x2 & 16x2 (New and existing)
- Radio 4x2 & 16x2 (New and existing)

Installation/Conversion Charges

- Installation/Conversion Charge Mon – Sat standard working hours
- Installation/Conversion Charge Monday – Friday Out of Hours; Sundays and Public/Bank Holiday

Managed Conversion Charge

- Managed Conversion Mon – Fri standard working hours
- Managed Conversion Monday – Friday Out of Hours; Saturdays, Sundays and Public/Bank Holiday

2 Day FOC Charge

- 2 Day FOC charge

Managed A End Shift Charge (between CPs)

- Managed A End Shift – Per Circuit Mon – Fri standard working hours
- Managed A End Shift – Per Circuit Monday – Friday Out of Hours; Saturdays, Sundays and Public/Bank Holiday

Diagnostic Test Officers

- Charge for Use of BT Diagnostic Test Officers Mon – Fri standard working hours & Monday – Friday Out of Hours; Sundays and Public/Bank Holiday

Radio Base Station Backhaul – Circuit Connection Charges and Cell Site Infrastructure[130]

Cell Site Infrastructure

- NTU 128Kbit/s – 256Kbit/s on existing copper
- NTU 128Kbit/s – 256Kbit/s on new copper
- NTU 320Kbit/s – 640Kbit/s on existing copper
- NTU 320Kbit/s – 640Kbit/s on new copper
- NTU 128Kbit/s – 640Kbit/s on 2Mbit infrastructure
- NTU 704Kbit/s – 960Kbit/s all delivery options
- 2Mbit/s circuit delivered by HDSL on existing copper
- 2Mbit/s circuit delivered by HDSL on new copper
- Provide 4 x 2Mbit/s Access at existing fibre site
- Provide 16 x 2Mbit/s Access at existing fibre site
- Provide 4 x 2Mbit/s Access to New Fibre Site
- Provide 16 x 2Mbit/s Access to New Fibre Site
- Subsequent 2Mbit/s circuit on existing Radio Base Station Backhaul 4 x 2 or 16 x 2 (provided after 10/01/05)
- Provision of 4 x 2Mbit/s Radio Access system
- Provision of 16 x 2Mbit/s Radio Access system
- Radio Site Share
- Singleton NTE
- Multiple NTE

SiteConnect

Re-Parenting Charges[131]

- Re-Parent carried out during BT Normal Working Hours
- Additional charge for re-parent carried out outside of BT Normal Working Hours an additional charge will apply.

Re-Arrangement Charges[132]

- Rearrange carried out during BT Normal Working Hours

[130] These charges correspond to the Carrier Price List, Section B11, Part 11.02.02
[131] These charges correspond to the Carrier Price List, Section B12, Part 12.01.4
[132] These charges correspond to the Carrier Price List, Section B12, Part 12.01.5

- Additional charge for rearrange carried out outside of BT Normal Working Hours an additional charge will apply.

External Move of a Circuit to another Remote Site[133]

- 2Mbits

Survey Charges[134]

- All Bandwidths

Visits and Time Related Charges[135]

- As required

Bandwidth Changes[136] per VP

- Reconfiguration carried out during BT Normal Working Hours
- Additional charge for reconfiguration carried out outside of BT Normal Working Hours an additional charge will apply.

ATM Circuit Conversion[137] per VP per move

- Conversion carried out during BT Normal Working Hours
- Additional charge for conversion carried out outside of BT Normal Working Hours an additional charge will apply.

Excess Construction Charges[138]

- As per Openreach ECCs except for radio ECCs below
    - Customer Cabinet
    - Radio Monopole
    - Elevated Platform Usage (charge per day)

Standby power[139]

- Standby batteries if required

[133] These charges correspond to the Carrier Price List, Section B12, Part 12.01.6
[134] These charges correspond to the Carrier Price List, Section B12, Part 12.01.7
[135] These charges correspond to the Carrier Price List, Section B12, Part 12.01.8
[136] These charges correspond to the Carrier Price List, Section B12, Part 12.01.9
[137] These charges correspond to the Carrier Price List, Section B12, Part 12.01.10
[138] These charges correspond to the Carrier Price List, Section B12, Part 12.01.11
[139] These charges correspond to the Carrier Price List, Section B12, Part 12.01.12

Cancellation charges[140]

Major and hub sites

- % of connection charge related to number of working days before contracted delivery date

Remote sites

- % of connection charge related to number of working days before contracted delivery date

Under achievement against commitment[141]

For site linkage charge and 2Mb bandwidth charge

- Year 1
- Year 2
- Year 3
- Year 4
- Standard charges

Charging for Diagnostic Test Officers[142]

- Charge for Use of BT Diagnostic Test Officers Mon – Fri standard working hours & Monday – Friday Out of Hours; Sundays and Public/Bank Holiday

Section 4

Meaning of "TI All Other Sub-cap Services"

For the purpose of Condition 5.1, the expression "**TI All Other Sub-cap Services**" shall be construed as including the following products and/or services, subject to such changes as Ofcom may direct from time to time following any proposal by the Dominant Provider to introduce a new product and/or service or withdraw or substitute one or more of these products and/or services for another (in which case this list shall be construed accordingly):

Partial Private Circuits – Circuit Connection Charges and Third Party Infrastructure[143]

Connection of a new circuit single charge

- 64Kbit/s – 960Kbit/s
- 1Mbit/s
- 2Mbit/s
- 34Mbit/s – 45Mbit/s

[140] These charges correspond to the Carrier Price List, Section B12, Part 12.01.13
[141] These charges correspond to the Carrier Price List, Section B12, Part 12.01.14
[142] These charges correspond to the Carrier Price List, Section B12, Part 12.01.18
[143] These charges correspond to the Carrier Price List, Section B8, Part 8.02

- 140Mbit/s – 155Mbit/s

Circuit Rental/Maintenance[144]

For the following bandwidths covering: local end fixed charge per annum (third party customer link), main link fixed charge per annum, terminating segment charge (per km p.a.), regional trunk segment charge (per km p.a.), enhanced maintenance - fixed p.a., enhanced maintenance – per km p.a. and enhanced care + fixed p.a.

- 2.4k-64k
- 128k
- 192k
- 256k
- 320k
- 384k
- 448k
- 512k
- 576k
- 640k
- 704k
- 768k
- 832k
- 896k
- 960k
- 1024
- 1M
- 2M
- 34/45M
- 140/155M

Partial Private Circuit 155 MSH – MSH rental per annum

- Local end fixed charge p.a. (3rd party customer link)
- Main link fixed charge p.a.
- Core transportation link per km
- Enhanced maintenance - fixed p.a.
- Enhanced maintenance – per km p.a.

[144] These charges correspond to the Carrier Price List, Section B8, Part 8.03

Rental Charges - 4X2Mbit/s Package

- 0 - 5km
- 6 - 15km
- 16 - 35km
- 36 - 75km
- 76 - 150km
- 151 - 300km
- 301km+

Interpretation

Except insofar as the context otherwise requires, the terms or descriptions of products and/or services used in this Annex shall be construed as having the same meaning as those provided by the Dominant Provider on its website for definitions and explanations of its products in addition to future updates. These are currently found as follows:

- Products and/or services within the "**TI Basket**", being the products and/or services in Sections 1 to 4 of this Annex, please refer to https://www.btwholesale.com/pages/static/homepage/index.htm
- Specifically:
    - For Partial Private Circuits including POH, please refer to https://www.btwholesale.com/pages/static/Products/Data_and_IP_Connectivity/Partial_Private_Circuits/index.htm
    - For Netstream, please refer to https://www.btwholesale.com/pages/static/Products/Data_and_IP_Connectivity/Netstream/index.htm
    - For Radio Base Station Backhaul, please refer to https://www.btwholesale.com/pages/static/Products/Data_and_IP_Connectivity/Radio_Base_Station_Backhaul/index.htm
    - For SiteConnect, please refer to https://www.btwholesale.com/pages/static/Library/Pricing_and_Contractual_Information/carrier_price_list/cpl_sectionb12siteconnect.htm

Part 4: Condition 5.2

Controls of the AI WECLA Services

(a) Subject to paragraph **(b)**, the Dominant Provider shall take all reasonable steps to secure that, during each Relevant Year, the Percentage Change in each of the charges for each and every AI WECLA Service is not more than RPI reduced by RPI[145].

For the purpose of this paragraph **(a)**, the Percentage Change shall be calculated by employing the formula set out in paragraph **(b)**.

(b) The Percentage Change shall be calculated by employing the following formula:

$$C_t = \frac{(p_t - p_0)}{p_0}$$

where:

C_t is the Percentage Change in charges for the products and services in the sub-basket in question at a particular time, *t*, during the Relevant Year;

p_0 save for the First Relevant Year of the control, is the published charge made by the Dominant Provider for the specific product or service, *i*, at the beginning of the Relevant Year excluding any discounts offered by the Dominant Provider; and

p_t is the published charge made by the Dominant Provider for the specific product or service at the time, *t*, during the Relevant Year excluding any discounts offered by the Dominant Provider.

General provisions and interpretation

(c) Where the Dominant Provider makes a material change (other than to a charge) to any product or service which is subject to this Condition 5.2 or to the date on which its financial year ends or there is a material change in the basis of the Retail Prices Index, paragraphs **(a)** and **(b)** shall have effect subject to such reasonable adjustment to take account of the change as Ofcom may direct to be appropriate in the circumstances.

For the purposes of this paragraph, a material change to any product or service which is subject to this Condition 5.2 includes the introduction of a new product or service wholly or substantially in substitution for that existing product or service.

(d) The Dominant Provider shall record, maintain and supply to Ofcom in an electronic format, no later than three months after the end of each Relevant Year, the data necessary for Ofcom to monitor compliance of the Dominant Provider with the price control by performing the calculation of the Percentage Change. The data shall include:

i. pursuant to paragraph **(a)**, the calculated percentage change relating to each of the charges for each and every AI WECLA Service;

[145] But where RPI exceeds 5% the control for the purposes of this paragraph **(a)** will be RPI decreased by 5%.

ii. all relevant data the Dominant Provider used in the calculation of the percentage change, C_t, pursuant to paragraph **(b)**, including for each specific product or service, *i:*

iii. all relevant revenues accrued during the Relevant Financial Year in respect of the specific product or service;

iv. published charges made by the Dominant Provider at time, *t*, during the Relevant Year excluding any discounts offered by the Dominant Provider;

v. the relevant published charges at the start of the Relevant Year; and

vi. other data necessary for monitoring compliance with the charge control.

(e) Paragraphs **(a)** to **(d)** shall not apply to such extent as Ofcom may direct.

(f) The Dominant Provider shall comply with any direction Ofcom may make from time to time under this Condition 5.2.

Annex to Condition 5.2

Products and services subject to charge control pursuant to Condition 5.2

Section 1

Meaning of "AI WECLA" Services

For the purposes of Condition 5.2, the expression "**AI WECLA Services**" shall be construed as including the following products and/or services, subject to such changes as Ofcom may direct from time to time following any proposal by the Dominant Provider to introduce a new product and/or service or withdraw or substitute one or more of these products and/or services for another (in which case this list shall be construed accordingly).

Backhaul Extension Service (BES)
BES 100MBit/s and above Rental Charges - Prices are per end

- BES 100
- BES 155
- BES 622
- BES 1000
- BES 1000- Extended Reach

BES Daisy Chain 100MBit/s and above Rental Charges - Prices are per end

- BES 100
- BES 155
- BES 622
- BES 1000

BES 100MBit/s and above Term Rental Charges
Charges are per end for 3 year and 5 year minimum annual rental for the following services:

- BES 1000
- BES 1000 Extended Reach

BES Daisy Chain 100MBit/s and above Term Rental Charges - Prices are per end
Charges are per end for 3 year and 5 year minimum annual rental for the following services:

- BES 1000

BES/BES Daisy Chain 10MBit/s Connection and Rental Charges

- BES 10 annual rental price per end
- BES 10 daisy chain rental price per end

Main Link Charges - Prices are per metre of part thereof

- Main link per metre or part thereof (>0m up to 25,000 metres) - up to and including 1Gb/s annual rental

Circuit Upgrades (pricing includes engineering visit)

- BES 10 to BES 100
- BES 10 to BES 155
- BES 10 to BES 622
- BES 10 to BES 1000
- BES 100 to BES 155
- BES 100 to BES 622
- BES 100 to BES 1000
- BES 155 to BES 622
- BES 155 to BES 1000
- BES 622 to BES 1000

Circuit Migration Charges

- Successful Circuit Migration to BES (For LES10 - LES1000)
- Failed Circuit Migration to BES (For LES10 - LES1000
- Successful Circuit Migration to BES (For all other LES circuits)
- Failed Circuit Migration to BES (For all other LES circuits)

BES Circuit Shift Charges

- Shift - Internal. Internal Shift of a BES local end within the existing building
- Shift - External Resite. Resiting of a BES local end in another building served by the same local serving exchange
- Shift - External Rearrange. Rearranging a BES local end in another building served by a different local serving exchange

Resilient Option 2
Charges for annual rental, 3 year and 5 year minimum annual rentals for the following services:

- Backhaul Extension Services Generic Resilience Facility fee per circuit (all bandwidths)
- Main link per metre or part thereof - up to and including 1Gb/s
- Resilience link per metre or part thereof - up to and including 1Gb/s

Cancellation Charges

- CDD - 2 days
- CDD - 10 days - CDD -3 days
- KCI3 - CDD minus 11 days

Wholesale Extension Service & Wholesale End to end Extension Service
WES/WEES 100MBit/s circuits and above Annual Rental Charges - Prices are per end

- WES/WEES 100
- WES/WEES 155
- WES/WEES 622
- WES/WEES 1000 (LAN /SAN)
- WES/WEES 1000 Extended Reach

WES/WEES 10Mbit/s Annual Rental Charges - Prices are per end
- WES/WEES 10
- WES/WEES 10 - (Local Reach)
- WES/WEES 10 Managed

WES/WEES Main Link Charge - Prices are per metre of part thereof
- Main link - up to and including 1Gb/s

WES/WEES Circuit Upgrades (pricing includes engineering visit)
- WES/WEES 10 to WES/WEES 100
- WES/WEES 10 to WES/WEES 155
- WES/WEES 10 to WES/WEES 622
- WES/WEES 10 to WES/WEES 1000 (LAN or SAN)
- WES/WEES 10 to WES/WEES 1000 Extended Reach
- WES/WEES 100 to WES/WEES 155
- WES/WEES 100 to WES/WEES 622
- WES/WEES 100 to WES/WEES 1000 (LAN or SAN)
- WES/WEES 155 to WES/WEES 622
- WES/WEES 155 to WES/WEES 1000 (LAN or SAN)
- WES/WEES 622 to WES/WEES 1000 (LAN or SAN)

WES LA Circuit Regrades:
- WES 10 (managed) to WES-LA 10
- WES 100 to WES LA 100
- WES 1000 to WES LA 1000
- WES 1000 (LAN extension) to WES LA 1000 (LAN extension)
- WES 1000 (SAN extension) to WES LA 1000 (SAN extension)

Wholesale Extension Services Local Access Annual Rental Charges - Prices are per circuit
- WES Local Access 10 managed
- WES Local Access 100 managed
- WES Local Access 1000 managed

WES LA Circuit Upgrades:

- WES LA10 to WES LA 100
- WES LA10 to WES LA 1000
- WES LA100 to WES LA 1000
- Upgrade Engineering Visit Per Circuit

Cancellation Charges

- CDD - 2 days
- CDD - 10 days - CDD -3 days
- KCI3 - CDD minus 11 days

WES / WEES Circuit Shift Charges

- Shift - Internal. Internal Shift of a WES/WEES local end within the existing building
- Shift - External Resite. Resiting of a WES/WEES local end in another building served by the same local serving exchange
- Shift - External Rearrange. Rearranging a WES/WEES local end in another building served by a different local serving exchange

WES/WEES Resilience Option 1 (Hot Standby) Connection & Rental Charges)

- WES 100 Resilient Option 1 Connection per end (1) annual rental charge
- WES 1000 Resilient Option 1 Connection per end (1) annual rental charge
- WEES 100 Resilient Option 1 Connection per end (1) annual rental charge
- WEES 1000 (LAN/SAN) Resilient Option 1 Connection per end (1) annual rental charge
- Generic Resilience Facility fee per path annual rental charge
- Main link per metre or part thereof - up to and including 1Gb/s connection charge
- Resilience link per metre or part thereof - up to and including 1Gb/s connection charge
- Main link per metre or part thereof - up to and including 1Gb/s annual rental charge
- Resilience link per metre or part thereof - up to and including 1Gb/s annual rental charge

WES Resilience Option 2 - Rental Charges

- WES Generic Resilience Facility fee per circuit (all bandwidths) annual rental charge
- Main link per metre or part thereof - up to and including 1Gb/s annual rental charge
- Resilience link per metre or part thereof - up to and including 1Gb/s annual rental charge
- Main link per metre or part thereof - up to and including 1Gb/s connection charge

- Resilience link per metre or part thereof - up to and including 1Gb/s connection charge

WEES Resilience Option 2 - Rental Charges

- WEES Generic Resilience Facility fee per circuit (all bandwidths) annual rental charge
- Main link per metre or part thereof - up to and including 1Gb/s connection charge
- Resilience link per metre or part thereof - up to and including 1Gb/s connection charge
- Main link per metre or part thereof - up to and including 1Gb/s annual rental charge
- Resilience link per metre or part thereof - up to and including 1Gb/s annual rental charge

WES - Aggregation Connection and Rental Charges

Connection and annual rental charges for all of the following services:

- WES Aggregation Tail 10Mb managed (up to 25km radial)
- WES Aggregation Tail 100Mb managed (up to 25km radial)
- Distance charge between exchanges metre or part thereof (spoke)
- WES Aggregation Aggregated Link RJ45 Handover
- WES Aggregation Aggregated Link 1Gb optical VLAN Remote Handover
- WES Aggregation Aggregated Link 1Gb optical VLAN Local Handover
- Distance charge between exchanges (Aggregated link) per metre or part thereof (> 0m)

WES - Aggregation Resilience RO1 Connection & Rental Charges

Connection and annual rental charges for all of the following services:

- WES Aggregation Resilient Link 1Gb Remote Handover only (incremental to Aggregated Link charge)
- Distance charge between exchanges (includes charge for both Aggregated link and Resilient link) per metre or part thereof (> 0m)
- WES Aggregation Resilient Link 1Gb Remote Handover only Monitoring Fee per path (Charged for both Aggregated Link and Resilient Link)

Upgrades are available as follows:

- Spoke Upgrades from 10Mb to 100Mb

Circuit Migration Charges

- Feature Reclassification Charge (per Circuit)
- Successful Circuit Migration to WES (LES10 - LES1000)
- Failed Circuit Migration to WES (LES10 - LES1000)

- Successful Circuit Migration to WES/ WEES (All other LES circuits)
- Failed Circuit Migration to WES/WEES (All other LES circuits)

Backhaul Network Services (BNS)
BNS Component Pricing Table
Charges for 1 year, 3 year and 5 year fixed periods (1 to 32 spokes per hub) for the following services:

- 1G Connection
- 1G Rental per Annum
- STM4 Connection
- STM4 Rental per Annum
- Spoke radial distance rental per Metre, per Annum
- Hub Module 1 Connection
- Hub [Spokes 1- 8] Rental per Annum
- Hub Module 2,3,4 Connection
- Hub [Spokes 9-16], [17-24] & [25-32] Rental per Annum
- Main link Connection
- Main link Rental per Annum
- Main link radial distance First Main Link Rental per Metre, per Annum
- Main link radial distance Subsequent Main Link Rental per Metre, per Annum
- PoP Module 1 Connection
- PoP [Spokes 1- 8] Rental per Annum
- PoP Module 2,3,4 Connection
- PoP [Spokes 9-16], [17-24] & [25-32] Rental per Annum

Additional charges: Interfaces

- M Mode 1000 Base SX (850nm Multi Mode) 50mm presentation. Reach approx 300 Metres. Used on DLE sites
- S Mode 1000 Base LX (1310nm Single Mode). Reach approx 10km. - Used on customer PoP sites One off additional

Cancellation charges

- 2 or less working days before Contractual Delivery Date
- 3 > 19 or less working days before Contractual Delivery Date
- 20 to 22 or less working days before Contractual Delivery Date
- 23 to 25 or less working days before Contractual Delivery Date
- 26 or more or less working days before Contractual Delivery Date

Openreach Network Backhaul Services

- ONBS 100 - per End Connection
- ONBS 100 - per End Annual Rental
- ONBS 1000 - per End Annual Rental
- Main link per metre or part thereof (> 0m) - 1Gb/s service Annual Rental
- Main link per metre or part thereof (> 0m) - 100Mb/s service Connection
- Main link per metre or part thereof (> 0m) - 100Mb/s service Annual Rental

Resilient Option 1

- Openreach Network Backhaul Services 100M Bandwidths per end Connection
- Openreach Network Backhaul Services 100M Bandwidths per end Annual Rental
- Openreach Network Backhaul Services Generic Resilience option 1 monitoring fee per path Connection
- Openreach Network Backhaul Services Generic Resilience option 1 monitoring fee per path Annual Rental
- Main link per metre or part thereof - 100Mb/s service Connection
- Main link per metre or part thereof - 100Mb/s service Annual Rental
- Main link per metre or part thereof - 1Gb/s service Connection
- Main link per metre or part thereof - 1Gb/s service Annual Rental
- Resilience link per metre or part thereof - up to 1Gb/s Connection
- Resilience link per metre or part thereof - up to 1Gb/s Annual Rental
- Resilience link per metre or part thereof - 1Gb/s Connection
- Resilience link per metre or part thereof - 1Gb/s Annual Rental

Resilient Options 2 & 3

- Openreach Network Backhaul Services - All Bandwidths per circuit Connection
- Openreach Network Backhaul Services - All Bandwidths per circuit Annual Rental
- Main link per metre or part thereof - 100Mb/s service Connection
- Main link per metre or part thereof - 100Mb/s service Annual Rental
- Main link per metre or part thereof - 1Gb/s service Connection
- Main link per metre or part thereof - 1Gb/s service Annual Rental
- Resilience link per metre or part thereof - 100Mb/s service Connection
- Resilience link per metre or part thereof - 100Mb/s service Annual Rental
- Resilience link per metre or part thereof - 1Gb/s service Connection
- Resilience link per metre or part thereof - 1Gb/s service Annual Rental

Cancellation Charges

- 2 or less working days before Contractual Delivery Date

- 3 > 19 or less working days before Contractual Delivery Date
- 20 to 22 or less working days before Contractual Delivery Date
- 23 to 25 or less working days before Contractual Delivery Date
- 26 or more or less working days before Contractual Delivery Date

Ethernet Backhaul Direct
Ethernet Backhaul Direct Connection and Rental Charges
Charges for connection and rental in bands A, B and C for the following services:

- 1Gbps
- 1Gbps - Extended Reach
- 10Gbps
- 10Gbps - Extended Reach

Migration Charges from BES to EBD (1 Gbps Only)

- BES to EBD Migration Connection Charge
- BES to EBD Migration Annual Rental Band A Charge
- BES to EBD Migration Annual Rental Band B Charge
- BES to EBD Migration Annual Rental Band C Charge

Ethernet Backhaul Direct Resilience Option 2

- Generic Facility Fee per Circuit Annual Rental Band A Charge
- Generic Facility Fee per Circuit Annual Rental Band B Charge
- Generic Facility Fee per Circuit Annual Rental Band C Charge

Cancellation Charges

- 2 or less working days before Contractual Delivery Date
- 3 > 19 working days before Contractual Delivery Date
- 20 to 22 working days before Contractual Delivery Date
- 23 to 25 working days before Contractual Delivery Date
- 26 or more working days before Contractual Delivery Date

Bulk Transport Link
Bulk Transport Link for 1Gbps
Openreach Handover Point (OHP) Hub
Charges are for 1 year, 3 year and 5 year minimum period options for the following services:

- Module 1 Connection
- Module 1 Rental per Annum
- Module 2,3,4 Connection
- Module 2,3,4 Rental per Annum
- Main Link Connection

- Main Link Rental per Annum

Charges are for 5 year minimum period option only for the following services:

- Migration from BES to BTL Hub Module 1 Migration
- Migration from BES to BTL Hub Module 1 Rental per Annum
- Migration from BES to BTL Hub Module 2,3,4 Migration
- Migration from BES to BTL Hub Module 2,3,4 Rental per Annum
- Migration Charge from BES to BTL Main Link
- Migration Charge from BES to BTL Main Link Rental per Annum

Main Link Radial Distance Charges for 1 year, 3 year and 5 year minimum period options for the following service:

- 1st Main Link Rental per annum per metre or part thereof (>0m up to 35,000 metres)

Point of Presence (PoP) charges for 1 year, 3 year and 5 year minimum period options for the following services:

- Module 1 Connection
- Module 1Rental per Annum
- Module 2,3,4 Connection
- Module 2,3,4 Rental per Annum

Point of Presence (PoP) charges for 5 year minimum period option only for the following services:

- Migration from BES to BTL PoP Module 1 Migration
- Migration from BES to BTL PoP Module 1 Rental per Annum
- Migration from BES to BTL PoP Module 2,3,4 Migration
- Migration from BES to BTL PoP Module 2,3,4 Rental per Annum

Additional charges: Interfaces

- S Mode Interface 1000 Base LX (1310nm Single Mode). Reach approx 10km
- S Mode Interface used on customer PoP sites

Cancellation Charges

- 2 or less working days before Contractual Delivery Date
- 3 > 19 working days before Contractual Delivery Date
- 20 to 22 working days before Contractual Delivery Date
- 23 to 25 working days before Contractual Delivery Date
- 26 or more working days before Contractual Delivery Date

Ethernet Access Direct (EAD) including EAD Enable

EAD circuits

- EAD 10 connection
- EAD 10 annual rental
- EAD 100 connection
- EAD 100 annual rental
- EAD 1000 connection
- EAD 1000 annual rental
- EAD 1000 (60 month minimum period) connection
- EAD 1000 (60 month minimum period) annual rental
- EAD 1000 Extended Reach connection
- EAD 1000 Extended Reach annual rental
- EAD 1000 Extended Reach (60 month minimum period) connection
- EAD 1000 Extended Reach (60 month minimum period) annual rental

EAD Modify - Upgrade Charges

- EAD Access 10 to 100
- EAD Access 10 to 1000 or 1000 (60 month minimum period)
- EAD Access 100 to 1000 or 1000 (60 month minimum period)
- EAD Access 1000 to 1000 (60 month minimum period)
- EAD Local Access 10 LA to 100 LA
- EAD Local Access 10 LA to 1000 LA or 1000 LA (60 month minimum period)
- EAD Local Access 100 LA to 1000 LA or 1000 LA (60 month minimum period)
- EAD Local Access 1000 LA to 1000 LA (60 month minimum period)

WES/WEES/BES to EAD Transfer Migration Charges

- WES/WEES 10 Unmanaged to EAD 100
- WES/WEES 10 Unmanaged to EAD 1000 (standard or 60 month minimum period)
- WES/WEES 10 Managed to EAD 100
- WES/WEES 10 Managed to EAD 1000 (standard or 60 month minimum period)
- WES/WEES 10 LA to EAD 100 LA
- WES/WEES 10 LA to EAD 1000 LA (standard or 60 month minimum period)
- WES/WEES 10 LR to EAD 100
- WES/WEES 10 LR to EAD 100 LA
- WES/WEES 10 LR to EAD 1000 (standard or 60 month minimum period)
- WES/WEES 10 LR to EAD 1000 LA (standard or 60 month minimum period)
- WES/WEES 100 to EAD 1000 (standard or 60 month minimum period)

- WES/WEES 100 Resilience Option 1 to EAD 1000 Resilient Option 1 (Standard or 60 month minimum period)
- WES/WEES 100 LA to EAD 1000 LA (standard or 60 month minimum period)
- WES/WEES 155 to EAD 1000 (standard or 60 month minimum period)
- WES/WEES 622 to EAD 1000 (standard or 60 month minimum period)
- BES/BES Daisy Chain 10 to EAD 100
- BES/BES Daisy Chain 10 to EAD 1000 (standard or 60 month minimum period)
- BES/BES Daisy Chain 100 to EAD 1000 (standard or 60 month minimum period)
- BES/BES Daisy Chain 155 to EAD 1000 (standard or 60 month minimum period)
- BES/BES Daisy Chain 622 to EAD 1000 (standard or 60 month minimum period)

EAD Local Access 10 Mbit/s circuits and above

- EAD Local Access 10 connection
- EAD Local Access 10 annual rental
- EAD Local Access 100 connection
- EAD Local Access 100 annual rental
- EAD Local Access 1000 connection
- EAD Local Access 1000 annual rental
- EAD Local Access 1000 (60 month minimum period) connection
- EAD Local Access 1000 (60 month minimum period) annual rental

EAD Main Link Charge

- Main link per metre or part thereof annual rental

EAD Resilience Option 1 (Hot Standby)

- EAD 10 Local Access Resilient Option 1 connection
- EAD 10 Local Access Resilient Option 1 annual rental
- EAD 100 Local Access Resilient Option 1 connection
- EAD 100 Local Access Resilient Option 1 annual rental
- EAD 1000 Local Access Resilient Option 1 connection
- EAD 1000 Local Access Resilient Option 1 annual rental
- EAD 1000 Local Access Resilient Option 1 (60 month minimum period) connection
- EAD 1000 Local Access Resilient Option 1 (60 month minimum period) annual rental
- EAD 10 Resilient Option 1 connection
- EAD 10 Resilient Option 1 annual rental
- EAD 100 Resilient Option 1 connection
- EAD 100 Resilient Option 1 annual rental

- EAD 1000 Resilient Option 1 connection
- EAD 1000 Resilient Option 1 annual rental
- EAD 1000 Resilient Option 1 (60 month minimum period) connection
- EAD 1000 Resilient Option 1 (60 month minimum period) annual rental
- EAD 1000 Extended Reach Resilient Option 1 connection
- EAD 1000 Extended Reach Resilient Option 1 annual rental
- EAD 1000 Extended Reach Resilient Option 1 (60 month minimum period) connection
- EAD 1000 Extended Reach Resilient Option 1 (60 month minimum period) annual rental

RO2 Resilience Main Link Charge

- Generic Resilience Facility fee per path annual rental
- RO2 Main link per metre or part thereof annual rental
- RO2 Resilience main link per metre or part thereof annual rental

RO1 Resilience Main Link Charge

- Generic Resilience Facility fee per path annual rental
- RO1 Resilience main link per metre or part thereof annual rental

EAD Enable

- EAD Enable 10 connection
- EAD Enable 10 annual rental
- EAD Enable 10 Resilient Option 1 connection
- EAD Enable 10 Resilient Option 1 annual rental
- EAD Enable 10 Local Access connection
- EAD Enable 10 Local Access annual rental
- EAD Enable 10 Local Access Resilient Option 1 connection
- EAD Enable 10 Local Access Resilient Option 1 annual rental
- EAD Enable 100 connection
- EAD Enable 100 annual rental
- EAD Enable 100 Resilient Option 1 connection
- EAD Enable 100 Resilient Option 1 annual rental
- EAD Enable 100 Local Access connection
- EAD Enable 100 Local Access annual rental
- EAD Enable 100 Local Access Resilient Option 1 connection
- EAD Enable 100 Local Access Resilient Option 1 annual rental

- EAD Enable 1000 connection
- EAD Enable 1000 annual rental
- EAD Enable 1000 Resilient Option 1 connection
- EAD Enable 1000 Resilient Option 1 annual rental
- EAD Enable 1000 Local Access connection
- EAD Enable 1000 Local Access annual rental
- EAD Enable 1000 Local Access Resilient Option 1 connection
- EAD Enable 1000 Local Access Resilient Option 1 annual rental
- EAD Enable 1000 Extended Reach connection
- EAD Enable 1000 Extended Reach annual rental
- EAD Enable 1000 Extended Reach Resilient Option 1 connection
- EAD Enable 1000 Extended Reach Resilient Option 1 annual rental
- EAD Enable 1000 (60 month term) connection
- EAD Enable 1000 (60 month term) annual rental
- EAD Enable 1000 Resilient Option 1 (60 month term) connection
- EAD Enable 1000 Resilient Option 1 (60 month term) annual rental
- EAD Enable 1000 Local Access Resilient Option 1 (60 month term) connection
- EAD Enable 1000 Local Access Resilient Option 1 (60 month term) annual rental
- EAD Enable 1000 Local Access (60 month term) connection
- EAD Enable 1000 Local Access (60 month term) annual rental
- EAD Enable 1000 Extended Reach (60 month term) connection
- EAD Enable 1000 Extended Reach (60 month term) annual rental
- EAD Enable 1000 Extended Reach Resilient Option 1 (60 month term) connection
- EAD Enable 1000 Extended Reach Resilient Option 1 (60 month term) annual rental

EAD Enable Main Link Charge

- Main link per metre or part thereof annual rental

EAD Enable RO2 Resilience Main Link Charge

- Generic Resilience Facility fee per path annual rental
- RO2 Resilience Main link per metre or part thereof annual rental

EAD Enable RO1 Resilience Main Link Charge

- Generic Resilience Facility fee per path annual rental
- RO1 Resilience Main link per metre or part thereof annual rental

Cancellation Charges: all bandwidths, except 1Gb/s (60 month minimum period) - before delivery

- CDD minus 2 days Working Days before CDD or on completion of following activities

- CDD minus 10 days to CDD minus 3 days Working Days before CDD or on completion of following activities
- KCI3 to CDD minus 11 days Working Days before CDD or on completion of following
- KCI3 Working Days before CDD or on completion of following activities

Cancellation Charges: 1Gb/s (60 month minimum period) - before delivery

- 2 or less working days before Contractual Delivery Date
- 3 to 20 working days before Contractual Delivery Date
- 21 to 29 working days before Contractual Delivery Date
- 30 to 38 working days before Contractual Delivery Date
- 39 or more working days before Contractual Delivery Date

Termination Charges: 1Gb/s (60 month minimum period) - after delivery

- <1 Years after Contractual Delivery Date
- <2 Years after Contractual Delivery Date
- <3 Years after Contractual Delivery Date
- <4 Years after Contractual Delivery Date
- <5 Years after Contractual Delivery Date

EAD Modify Circuit Shift Charges

- Shift - Internal. Internal Shift of an EAD local end within the existing building.
- Shift - External Resite. Resiting of an EAD local end in another building served by the same local serving exchange
- Shift - External Rearrange. Rearranging an EAD local end in another building served by a different local serving exchange

Interpretation

Except insofar as the context otherwise requires, the terms or descriptions of products and/or services used in this Annex shall be construed as having the same meaning as those provided by the Dominant Provider on its website for definitions and explanations of its products in addition to future updates. These are currently found as follows:

- Products and/or services within the meaning of "**AI WECLA Services**", please refer to http://www.openreach.co.uk/orpg/home/home.do
- Specifically:
    - For EAD, please refer to http://www.openreach.co.uk/orpg/home/products/ethernetservices/ethernetaccessdirect/ead.do

- For EBD, please refer to http://www.openreach.co.uk/orpg/home/products/ethernetservices/ethernetbackhauldirect/ebd.do
- For BTL, please refer to http://www.openreach.co.uk/orpg/home/products/ethernetservices/bulktransportlink/bulktransportlink.do
- For WES/WEES, please refer to http://www.openreach.co.uk/orpg/home/products/ethernetservices/wholesaleextensionservices/wes.do
- For BES, please refer to http://www.openreach.co.uk/orpg/home/products/ethernetservices/backhaulextensionservices/bes.do
- For Openreach Network Backhaul Service, please refer to http://www.openreach.co.uk/orpg/home/products/ethernetservices/openreachnetworkbackhaulservices/onbs.do
- For Backhaul Network Service, please refer to http://www.openreach.co.uk/orpg/home/products/ethernetservices/backhaulnetworkservices/bns.do
- For Cablelink, please refer to http://www.openreach.co.uk/orpg/home/products/ethernetservices/cablelink/cablelink.do

Part 5: Condition 5.3

Controls of the Ethernet Services Basket

(a) Subject to paragraph **(b)**, the Dominant Provider shall take all reasonable steps to secure that, at the end of each Relevant Year, the Percentage Change (as determined in accordance with paragraph **(c)**) in the aggregate of charges for all of the products and services of the Ethernet Services Basket is not more than the Controlling Percentage (as determined in accordance with paragraph **(d)**).

(b) For the purpose of complying with paragraph **(a)**, the Dominant Provider shall take all reasonable steps to secure that the revenue it accrues as a result of all relevant individual charge changes during any Relevant Year shall be no more than that which it would have accrued had it made a single charge change equal to the Controlling Percentage on the first day of the Relevant Year.

For the avoidance of doubt, this obligation shall be deemed to be satisfied where the following formula is satisfied:

$$\sum_{i=1}^{n}\left[W_1 R_i \frac{(p_{1,i} - p_{0,i})}{p_{0,i}} + W_t R_i \frac{(p_{t,i} - p_{0,i})}{p_{0,i}}\right] \leq TRC$$

where:

n is the number of products and services in the specified category (i.e. the basket in question);

$p_{0,i}$ is, save for the First Relevant Year of the control, the published charge made by the Dominant Provider for the specific product or service, *i*, at the beginning of the Relevant Year excluding any discounts offered by the Dominant Provider;

$p_{1,i}$ is the published charge after the first change in charge in the Relevant Year excluding any discounts offered by the Dominant Provider;

$p_{t,i}$ is the published charge made by the Dominant Provider for the specific product or service, *i*, at time, *t*, during the Relevant Year excluding any discounts offered by the Dominant Provider;

R_i is the sum of the revenue accrued during the Relevant Financial Year in respect of the specific product or service, *i*, and the revenue accrued during the Relevant Financial Year in respect of equivalent products or services provided by the Dominant Provider to itself, calculated to exclude any discounts offered by the Dominant Provider;

W_1 is the proportion of the Relevant Year in which the first charge change applies, calculated by the number of days during which the charge was in effect and dividing by 365 (366 in a leap year);

W_t is the proportion of the Relevant Year in which each subsequent charge, p_t, is in effect, calculated by the number of days during which the charge is in effect and dividing by 365 (366 in a leap year); and

TRC is the target revenue change required in the Relevant Year to achieve compliance with paragraph **(a)**, calculated by the Controlling Percentage multiplied by the revenue accrued during the Relevant Financial Year.

(c) The Percentage Change for the purpose of the Ethernet Services Basket specified in paragraph **(a)** shall be calculated by employing the following formula:

$$C_t = \frac{\sum_{i=1}^{n}\left[R_i \frac{(p_{t,i} - p_{0,i})}{p_{0,i}}\right]}{\sum_{i=1}^{n} R_i}$$

where:

C_t is the Percentage Change in the aggregate of charges for the products and/or services in the specified category (i.e. the basket in question) at a particular time, *t*, during the Relevant Year;

n is as defined in paragraph **(b)**;

R_i is as defined in paragraph **(b)**;

$p_{0,i}$ is as defined in paragraph **(b)**; and

$p_{t,i}$ is as defined in paragraph **(b)**.

(d) Subject to paragraphs **(e)** and **(f)**, the Controlling Percentage in relation to any Relevant Year means for the Ethernet Services Basket specified in paragraph **(a)**, RPI decreased by [X][146] percentage points.

Calculation of Carry Forward Percentage

(e) Where the Percentage Change in any Relevant Year is less than the Controlling Percentage, then for the purpose of the Ethernet Services Basket specified in paragraph **(a)** the Controlling Percentage for the following Relevant Year shall be determined in accordance with paragraph **(d)**, but increased by the amount of such deficiency.

(f) Where the Percentage Change in any Relevant Year is more than the Controlling Percentage, then for the purpose the Ethernet Services Basket specified in paragraph **(a)** the Controlling Percentage for the following Relevant Year shall be determined in accordance with paragraph **(d)**, but decreased by the amount of such excess.

Controls of sub-basket

(g) In the case of the Ethernet Interconnection Services Sub-basket, the Dominant Provider shall also and, in any event, take all reasonable steps to secure that, at the end of each Relevant Year, the Percentage Change in the aggregate of charges for

[146] [*Ofcom is consulting on the appropriate value of X within a range of 8% and 16%, as discussed in Section 5 of the consultation document attached to this Notification*]

all of the products and services of Interconnection Services Sub-basket is not more than RPI reduced by 12[147] percentage points.

For the purpose of this paragraph **(g)**, the Percentage Change shall be calculated by employing the formula set out in paragraph **(c)**.

Controls of sub-cap

(h) In the case of the Ethernet All Other Sub-cap Services, the Dominant Provider shall also and, in any event, take all reasonable steps to secure that, during each Relevant Year, the Percentage Change in each of the charges for each and every Ethernet All Other Sub-cap Service is not more than RPI decreased by RPI[148].

For the purpose of this paragraph **(h)**, the Percentage Change shall be calculated by employing the formula set out in paragraph **(i)**.

(i) The Percentage Change for the purpose of the Ethernet All Other Sub-cap Services shall be calculated by employing the following formula:

$$C_t = \frac{(p_t - p_0)}{p_0}$$

where:

C_t is the Percentage Change in charges for the products and services in the sub-basket in question at a particular time *t* during the Relevant Year;

p_0 save for the First Relevant Year of the control, is the published charge made by the Dominant Provider for the specific product or service, i, at the beginning of the Relevant Year excluding any discounts offered by the Dominant Provider; and

p_t is the published charge made by the Dominant Provider for the specific product or service at the time, *t*, during the Relevant Year excluding any discounts offered by the Dominant Provider.

General provisions and interpretation

(j) Where the Dominant Provider makes a material change (other than to a charge) to any product or service which is subject to this Condition 5.3 or to the date on which its financial year ends or there is a material change in the basis of the Retail Prices Index, paragraphs **(a)** to **(i)** shall have effect subject to such reasonable adjustment to take account of the change as Ofcom may direct to be appropriate in the circumstances.

For the purposes of this paragraph, a material change to any product or service which is subject to this Condition 5.3 includes the introduction of a new product or service wholly or substantially in substitution for that existing product or service.

[147] [*Provisional value based on the midpoint of our consultation range for the value of X in paragraph **(d)***]

[148] [*Provisional value based on the midpoint of our consultation range for the value of X in paragraph **(d)***] Where RPI exceeds 5% the control for the purposes of this paragraph **(h)** will be RPI decreased by 5%.

(k) The Dominant Provider shall record, maintain and supply to Ofcom in an electronic format, no later than three months after the end of each Relevant Year, the data necessary for Ofcom to monitor compliance of the Dominant Provider with the price control by performing the calculation of the Percentage Change. The data shall include:

i. pursuant to paragraph **(a)**, the calculated percentage change relating to the aggregate of charges for all of the products and services in the Ethernet Services Basket;

ii. pursuant to paragraph **(b)**, calculation of the revenue accrued as a result of all relevant individual charge charges during any Relevant Year compared to the target revenue change;

iii. all relevant data the Dominant Provider used in the calculation of the percentage change, C_t, pursuant to paragraph **(c)**, including for each specific product or service, *i:*

iv. all relevant revenues accrued during the Relevant Financial Year in respect of the specific product or service;

v. published charges made by the Dominant Provider at time, *t*, during the Relevant Year excluding any discounts offered by the Dominant Provider;

vi. the relevant published charges at the start of the Relevant Year;

vii. other data necessary for monitoring compliance with the charge control.

(l) Paragraphs **(a)** to **(k)** shall not apply to such extent as Ofcom may direct.

(m) The Dominant Provider shall comply with any direction Ofcom may make from time to time under this Condition 5.3.

Annex to Condition 5.3

Products and services subject to charge control pursuant to Condition 5.3

Section 1

Meaning of "Ethernet Interconnection Services Sub-basket"

For the purposes of Condition 5.3, the expression "**Ethernet Interconnection Services Sub-basket**" shall be construed as including the following products and/or services, subject to such changes as Ofcom may direct from time to time following any proposal by the Dominant Provider to introduce a new product and/or service or withdraw or substitute one or more of these products and/or services for another (in which case this list shall be construed accordingly).

Bulk Transport Link ('BTL') for 1Gbps
Openreach Handover Point (OHP) Hub
Charges are for 1 year, 3 year and 5 year minimum period options for the following services:

- Module 1 Connection
- Module 1 Rental per Annum
- Module 2,3,4 Connection
- Module 2,3,4 Rental per Annum
- Main Link Connection
- Main Link Rental per Annum

Main Link Radial Distance Charges for 1 year, 3 year and 5 year minimum period options for the following service:

- 1st Main Link Rental per annum per metre or part thereof (>0m up to 35,000 metres)

Point of Presence (PoP) charges for 1 year, 3 year and 5 year minimum period options for the following services:

- Module 1 Connection
- Module 1 Rental per Annum
- Module 2,3,4 Connection
- Module 2,3,4 Rental per Annum

Section 2

Meaning of "Ethernet All Other Service Sub-cap"

For the purposes of Condition 5.3, the expression "**Ethernet All Other Service Sub-cap**" shall be construed as including the following products and/or services, subject to such changes as Ofcom may direct from time to time following any proposal by the Dominant Provider to introduce a new product and/or service or withdraw or substitute one or more of these products and/or services for another (in which case this list shall be construed accordingly).

Wholesale Extension Service & Wholesale End to end Extension Service

WES/WEES 100MBit/s circuits and above - Connection Charges - Prices are per end

- WES/WEES 2500
- WES/WEES 10000

WES/WEES 100MBit/s circuits and above Annual Rental Charges - Prices are per end

- WES/WEES 100
- WES/WEES 155
- WES/WEES 622
- WES/WEES 1000 (LAN /SAN)
- WES/WEES 1000 Extended Reach
- WES/WEES 2500
- WES/WEES 10000

WES/WEES 10Mbit/s Annual Rental Charges - Prices are per end

- WES/WEES 10
- WES/WEES 10 - (Local Reach)
- WES/WEES 10 Managed

WES/WEES Main Link Charge - Prices are per metre of part thereof

- Main link - up to and including 1Gb/s
- Main link - over 1Gb/s

WES/WEES Circuit Upgrades (pricing includes engineering visit)

- WES/WEES 10 to WES/WEES 100
- WES/WEES 10 to WES/WEES 155
- WES/WEES 10 to WES/WEES 622
- WES/WEES 10 to WES/WEES 1000 (LAN or SAN)
- WES/WEES 10 to WES/WEES 1000 Extended Reach
- WES/WEES 100 to WES/WEES 155
- WES/WEES 100 to WES/WEES 622
- WES/WEES 100 to WES/WEES 1000 (LAN or SAN)
- WES/WEES 155 to WES/WEES 622
- WES/WEES 155 to WES/WEES 1000 (LAN or SAN)
- WES/WEES 622 to WES/WEES 1000 (LAN or SAN)

WES LA Circuit Regrades:

- WES 10 (managed) to WES-LA 10
- WES 100 to WES LA 100
- WES 1000 to WES LA 1000

- WES 1000 (LAN extension) to WES LA 1000 (LAN extension)
- WES 1000 (SAN extension) to WES LA 1000 (SAN extension)

Wholesale Extension Services Local Access Annual Rental Charges - Prices are per circuit

- WES Local Access 10 managed
- WES Local Access 100 managed
- WES Local Access 1000 managed

WES LA Circuit Upgrades:

- WES LA10 to WES LA 100
- WES LA10 to WES LA 1000
- WES LA100 to WES LA 1000
- Upgrade Engineering Visit Per Circuit

Cancellation Charges

- CDD - 2 days
- CDD - 10 days - CDD -3 days
- KCI3 - CDD minus 11 days

WES / WEES Circuit Shift Charges

- Shift - Internal. Internal Shift of a WES/WEES local end within the existing building
- Shift - External Resite. Resiting of a WES/WEES local end in another building served by the same local serving exchange
- Shift - External Rearrange. Rearranging a WES/WEES local end in another building served by a different local serving exchange

WES/WEES Resilience Option 1 (Hot Standby) Connection & Rental Charges)

- WES 100 Resilient Option 1 Connection per end (1) annual rental charge
- WES 1000 Resilient Option 1 Connection per end (1) annual rental charge
- WEES 100 Resilient Option 1 Connection per end (1) annual rental charge
- WEES 1000 (LAN/SAN) Resilient Option 1 Connection per end (1) annual rental charge
- Generic Resilience Facility fee per path annual rental charge
- Main link per metre or part thereof - up to and including 1Gb/s connection charge
- Main link per metre or part thereof - over 1Gb/s connection charge
- Resilience link per metre or part thereof - up to and including 1Gb/s connection charge
- Resilience link per metre or part thereof - over 1Gb/s connection charge
- Main link per metre or part thereof - up to and including 1Gb/s annual rental charge

- Main link per metre or part thereof - over 1Gb/s annual rental charge
- Resilience link per metre or part thereof - up to and including 1Gb/s annual rental charge
- Resilience link per metre or part thereof - over 1Gb/s annual rental charge

WES Resilience Option 2 - Rental Charges

- WES Generic Resilience Facility fee per circuit (all bandwidths) annual rental charge
- Main link per metre or part thereof - up to and including 1Gb/s annual rental charge
- Main link per metre or part thereof - over 1Gb/s annual rental charge
- Resilience link per metre or part thereof - up to and including 1Gb/s annual rental charge
- Resilience link per metre or part thereof - over 1Gb/s annual rental charge
- Main link per metre or part thereof - up to and including 1Gb/s connection charge
- Main link per metre or part thereof - over 1Gb/s connection charge
- Resilience link per metre or part thereof - up to and including 1Gb/s connection charge
- Resilience link per metre or part thereof - over 1Gb/s connection charge

WEES Resilience Option 2 - Rental Charges

- WEES Generic Resilience Facility fee per circuit (all bandwidths) annual rental charge
- Main link per metre or part thereof - up to and including 1Gb/s connection charge
- Main link per metre or part thereof - over 1Gb/s connection charge
- Resilience link per metre or part thereof - up to and including 1Gb/s connection charge
- Resilience link per metre or part thereof - over 1Gb/s connection charge
- Main link per metre or part thereof - up to and including 1Gb/s annual rental charge
- Main link per metre or part thereof - over 1Gb/s annual rental charge
- Resilience link per metre or part thereof - up to and including 1Gb/s annual rental charge
- Resilience link per metre or part thereof - over 1Gb/s annual rental charge

WES - Aggregation Connection and Rental Charges

Connection and annual rental charges for all of the following services:

- WES Aggregation Tail 10Mb managed (up to 25km radial)
- WES Aggregation Tail 100Mb managed (up to 25km radial)
- Distance charge between exchanges metre or part thereof (spoke)
- WES Aggregation Aggregated Link RJ45 Handover

- WES Aggregation Aggregated Link 1Gb optical VLAN Remote Handover
- WES Aggregation Aggregated Link 1Gb optical VLAN Local Handover
- Distance charge between exchanges (Aggregated link) per metre or part thereof (> 0m)

WES - Aggregation Resilience RO1 Connection & Rental Charges
Connection and annual rental charges for all of the following services:

- WES Aggregation Resilient Link 1Gb Remote Handover only (incremental to Aggregated Link charge)
- Distance charge between exchanges (includes charge for both Aggregated link and Resilient link) per metre or part thereof (> 0m)
- WES Aggregation Resilient Link 1Gb Remote Handover only Monitoring Fee per path (Charged for both Aggregated Link and Resilient Link)

Upgrades are available as follows:

- Spoke Upgrades from 10Mb to 100Mb

Circuit Migration Charges

- Successful Circuit Migration to WES (LES10 - LES1000)
- Failed Circuit Migration to WES (LES10 - LES1000)
- Successful Circuit Migration to WES/ WEES (All other LES circuits)
- Failed Circuit Migration to WES/WEES (All other LES circuits)

Backhaul Network Services (BNS)
BNS Component Pricing Table
Charges for 1 year, 3 year and 5 year fixed periods (1 to 32 spokes per hub) for the following services:

- 1G Connection
- 1G Rental per Annum
- STM4 Connection
- STM4 Rental per Annum
- 2Gb Connection
- 2Gb Rental per Annum
- Spoke radial distance Rental per Metre, per Annum
- Hub Module 1 Connection
- Hub [Spokes 1- 8] Rental per Annum
- Hub Module 2,3,4 Connection
- Hub [Spokes 9-16], [17-24] & [25-32] Rental per Annum
- Main link Connection
- Main link Rental per Annum

- Main link radial distance First Main Link Rental per Metre, per Annum
- Main link radial distance Subsequent Main Link Rental per Metre, per Annum
- PoP Module 1 Connection
- PoP [Spokes 1- 8] Rental per Annum
- PoP Module 2,3,4 Connection
- PoP [Spokes 9-16], [17-24] & [25-32] Rental per Annum

BNS Circuit Upgrades - one off fee
- 1Gb to 2Gb 1 year
- 1Gb to 2Gb 3 year
- 1Gb to 2Gb 5 year

Additional charges: Interfaces
- M Mode 1000 Base SX (850nm Multi Mode) 50mm presentation. Reach approx 300 Metres. Used on DLE sites
- S Mode 1000 Base LX (1310nm Single Mode). Reach approx 10km. - Used on customer PoP sites One off additional

Cancellation charges
- 2 or less working days before Contractual Delivery Date
- 3 > 19 or less working days before Contractual Delivery Date
- 20 to 22 or less working days before Contractual Delivery Date
- 23 to 25 or less working days before Contractual Delivery Date
- 26 or more or less working days before Contractual Delivery Date

Openreach Network Backhaul Services
- ONBS 100 - per End Connection
- ONBS 100 - per End Annual Rental
- ONBS 1000 - per End Annual Rental
- ONBS 10000 per End Connection
- ONBS 10000 per End Annual Rental
- Main link per metre or part thereof (> 0m) - 1Gb/s service Annual Rental
- Main link per metre or part thereof (> 0m) - 100Mb/s service Connection
- Main link per metre or part thereof (> 0m) - 100Mb/s service Annual Rental
- Main link per metre or part thereof (> 0m) – 10Gb/s service Connection
- Main link per metre or part thereof (> 0m) – 10Gb/s service Annual Rental

Resilient Option 1
- Openreach Network Backhaul Services 100M Bandwidths per end Connection

- Openreach Network Backhaul Services 100M Bandwidths per end Annual Rental
- Openreach Network Backhaul Services Generic Resilience option 1 monitoring fee per path Connection
- Openreach Network Backhaul Services Generic Resilience option 1 monitoring fee per path Annual Rental
- Main link per metre or part thereof - 100Mb/s service Connection
- Main link per metre or part thereof - 100Mb/s service Annual Rental
- Main link per metre or part thereof - 10Gb/s service Connection
- Main link per metre or part thereof - 10Gb/s service Annual Rental
- Main link per metre or part thereof - 1Gb/s service Connection
- Main link per metre or part thereof - 1Gb/s service Annual Rental
- Resilience link per metre or part thereof - up to 1Gb/s Connection
- Resilience link per metre or part thereof - up to 1Gb/s Annual Rental
- Resilience link per metre or part thereof - 1Gb/s Connection
- Resilience link per metre or part thereof - 1Gb/s Annual Rental
- Resilience link per metre or part thereof - over 1Gb/s Connection
- Resilience link per metre or part thereof - over 1Gb/s Annual Rental

Resilient Options 2 & 3

- Openreach Network Backhaul Services - All Bandwidths per circuit Connection
- Openreach Network Backhaul Services - All Bandwidths per circuit Annual Rental
- Main link per metre or part thereof - 100Mb/s service Connection
- Main link per metre or part thereof - 100Mb/s service Annual Rental
- Main link per metre or part thereof - 10Gb/s service Connection
- Main link per metre or part thereof - 10Gb/s service Annual Rental
- Main link per metre or part thereof - 1Gb/s service Connection
- Main link per metre or part thereof - 1Gb/s service Annual Rental
- Resilience link per metre or part thereof - 100Mb/s service Connection
- Resilience link per metre or part thereof - 100Mb/s service Annual Rental
- Resilience link per metre or part thereof - 1Gb/s service Connection
- Resilience link per metre or part thereof - 1Gb/s service Annual Rental
- Resilience link per metre or part thereof - 10Gb/s service Connection
- Resilience link per metre or part thereof - 10Gb/s service Annual Rental

Cancellation Charges

- 2 or less working days before Contractual Delivery Date
- 3 > 19 or less working days before Contractual Delivery Date

- 20 to 22 or less working days before Contractual Delivery Date
- 23 to 25 or less working days before Contractual Delivery Date
- 26 or more or less working days before Contractual Delivery Date

Ethernet Backhaul Direct
Ethernet Backhaul Direct Connection and Rental Charges
Charges for connection and rental in bands A, B and C for the following services:

- 1Gbps
- 1Gbps - Extended Reach
- 10Gbps
- 10Gbps - Extended Reach

Migration Charges from BES to EBD (1 Gbps Only)

- BES to EBD Migration Connection Charge
- BES to EBD Migration Annual Rental Band A Charge
- BES to EBD Migration Annual Rental Band B Charge
- BES to EBD Migration Annual Rental Band C Charge

Ethernet Backhaul Direct Resilience Option 2

- Generic Facility Fee per Circuit Annual Rental Band A Charge
- Generic Facility Fee per Circuit Annual Rental Band B Charge
- Generic Facility Fee per Circuit Annual Rental Band C Charge

Cancellation Charges

- 2 or less working days before Contractual Delivery Date
- 3 > 19 working days before Contractual Delivery Date
- 20 to 22 working days before Contractual Delivery Date
- 23 to 25 working days before Contractual Delivery Date
- 26 or more working days before Contractual Delivery Date

Ethernet Access Direct (EAD) including EAD Enable
EAD circuits

- EAD 10 connection
- EAD 10 annual rental
- EAD 100 connection
- EAD 100 annual rental
- EAD 1000 connection
- EAD 1000 annual rental
- EAD 1000 (60 month minimum period) connection

- EAD 1000 (60 month minimum period) annual rental
- EAD 1000 Extended Reach connection
- EAD 1000 Extended Reach annual rental
- EAD 1000 Extended Reach (60 month minimum period) connection
- EAD 1000 Extended Reach (60 month minimum period) annual rental

EAD Modify - Upgrade Charges

- EAD Access 10 to 100
- EAD Access 10 to 1000 or 1000 (60 month minimum period)
- EAD Access 100 to 1000 or 1000 (60 month minimum period)
- EAD Access 1000 to 1000 (60 month minimum period)
- EAD Local Access 10 LA to 100 LA
- EAD Local Access 10 LA to 1000 LA or 1000 LA (60 month minimum period)
- EAD Local Access 100 LA to 1000 LA or 1000 LA (60 month minimum period)
- EAD Local Access 1000 LA to 1000 LA (60 month minimum period)

WES/WEES/BES to EAD Transfer Migration Charges

- WES/WEES 10 Unmanaged to EAD 100
- WES/WEES 10 Unmanaged to EAD 1000 (standard or 60 month minimum period)
- WES/WEES 10 Managed to EAD 100
- WES/WEES 10 Managed to EAD 1000 (standard or 60 month minimum period)
- WES/WEES 10 LA to EAD 100 LA
- WES/WEES 10 LA to EAD 1000 LA (standard or 60 month minimum period)
- WES/WEES 10 LR to EAD 100
- WES/WEES 10 LR to EAD 100 LA
- WES/WEES 10 LR to EAD 1000 (standard or 60 month minimum period)
- WES/WEES 10 LR to EAD 1000 LA (standard or 60 month minimum period)
- WES/WEES 100 to EAD 1000 (standard or 60 month minimum period)
- WES/WEES 100 Resilience Option 1 to EAD 1000 Resilient Option 1 (Standard or 60 month minimum period)
- WES/WEES 100 LA to EAD 1000 LA (standard or 60 month minimum period)
- WES/WEES 155 to EAD 1000 (standard or 60 month minimum period)
- WES/WEES 622 to EAD 1000 (standard or 60 month minimum period)
- BES/BES Daisy Chain 10 to EAD 100
- BES/BES Daisy Chain 10 to EAD 1000 (standard or 60 month minimum period)
- BES/BES Daisy Chain 100 to EAD 1000 (standard or 60 month minimum period)
- BES/BES Daisy Chain 155 to EAD 1000 (standard or 60 month minimum period)

- BES/BES Daisy Chain 622 to EAD 1000 (standard or 60 month minimum period)

EAD Local Access 10 Mbit/s circuits and above

- EAD Local Access 10 connection
- EAD Local Access 10 annual rental
- EAD Local Access 100 connection
- EAD Local Access 100 annual rental
- EAD Local Access 1000 connection
- EAD Local Access 1000 annual rental
- EAD Local Access 1000 (60 month minimum period) connection
- EAD Local Access 1000 (60 month minimum period) annual rental

EAD Main Link Charge

- Main link per metre or part thereof annual rental

EAD Resilience Option 1 (Hot Standby)

- EAD 10 Local Access Resilient Option 1 connection
- EAD 10 Local Access Resilient Option 1 annual rental
- EAD 100 Local Access Resilient Option 1 connection
- EAD 100 Local Access Resilient Option 1 annual rental
- EAD 1000 Local Access Resilient Option 1 connection
- EAD 1000 Local Access Resilient Option 1 annual rental
- EAD 1000 Local Access Resilient Option 1 (60 month minimum period) connection
- EAD 1000 Local Access Resilient Option 1 (60 month minimum period) annual rental
- EAD 10 Resilient Option 1 connection
- EAD 10 Resilient Option 1 annual rental
- EAD 100 Resilient Option 1 connection
- EAD 100 Resilient Option 1 annual rental
- EAD 1000 Resilient Option 1 connection
- EAD 1000 Resilient Option 1 annual rental
- EAD 1000 Resilient Option 1 (60 month minimum period) connection
- EAD 1000 Resilient Option 1 (60 month minimum period) annual rental
- EAD 1000 Extended Reach Resilient Option 1 connection
- EAD 1000 Extended Reach Resilient Option 1 annual rental
- EAD 1000 Extended Reach Resilient Option 1 (60 month minimum period) connection

- EAD 1000 Extended Reach Resilient Option 1 (60 month minimum period) annual rental

RO2 Resilience Main Link Charge

- Generic Resilience Facility fee per path annual rental
- RO2 Main link per metre or part thereof annual rental
- RO2 Resilience main link per metre or part thereof annual rental

RO1 Resilience Main Link Charge

- Generic Resilience Facility fee per path annual rental
- RO1 Resilience main link per metre or part thereof annual rental

EAD Enable

- EAD Enable 10 connection
- EAD Enable 10 annual rental
- EAD Enable 10 Resilient Option 1 connection
- EAD Enable 10 Resilient Option 1 annual rental
- EAD Enable 10 Local Access connection
- EAD Enable 10 Local Access annual rental
- EAD Enable 10 Local Access Resilient Option 1 connection
- EAD Enable 10 Local Access Resilient Option 1 annual rental
- EAD Enable 100 connection
- EAD Enable 100 annual rental
- EAD Enable 100 Resilient Option 1 connection
- EAD Enable 100 Resilient Option 1 annual rental
- EAD Enable 100 Local Access connection
- EAD Enable 100 Local Access annual rental
- EAD Enable 100 Local Access Resilient Option 1 connection
- EAD Enable 100 Local Access Resilient Option 1 annual rental
- EAD Enable 1000 connection
- EAD Enable 1000 annual rental
- EAD Enable 1000 Resilient Option 1 connection
- EAD Enable 1000 Resilient Option 1 annual rental
- EAD Enable 1000 Local Access connection
- EAD Enable 1000 Local Access annual rental
- EAD Enable 1000 Local Access Resilient Option 1 connection
- EAD Enable 1000 Local Access Resilient Option 1 annual rental

- EAD Enable 1000 Extended Reach connection
- EAD Enable 1000 Extended Reach annual rental
- EAD Enable 1000 Extended Reach Resilient Option 1 connection
- EAD Enable 1000 Extended Reach Resilient Option 1 annual rental
- EAD Enable 1000 (60 month term) connection
- EAD Enable 1000 (60 month term) annual rental
- EAD Enable 1000 Resilient Option 1 (60 month term) connection
- EAD Enable 1000 Resilient Option 1 (60 month term) annual rental
- EAD Enable 1000 Local Access Resilient Option 1 (60 month term) connection
- EAD Enable 1000 Local Access Resilient Option 1 (60 month term) annual rental
- EAD Enable 1000 Local Access (60 month term) connection
- EAD Enable 1000 Local Access (60 month term) annual rental
- EAD Enable 1000 Extended Reach (60 month term) connection
- EAD Enable 1000 Extended Reach (60 month term) annual rental
- EAD Enable 1000 Extended Reach Resilient Option 1 (60 month term) connection
- EAD Enable 1000 Extended Reach Resilient Option 1 (60 month term) annual rental

EAD Enable Main Link Charge
- Main link per metre or part thereof annual rental

EAD Enable RO2 Resilience Main Link Charge
- Generic Resilience Facility fee per path annual rental
- RO2 Resilience Main link per metre or part thereof annual rental

EAD Enable RO1 Resilience Main Link Charge
- Generic Resilience Facility fee per path annual rental
- RO1 Resilience Main link per metre or part thereof annual rental

Cancellation Charges: all bandwidths, except 1Gb/s (60 month minimum period) - before delivery
- CDD minus 2 days Working Days before CDD or on completion of following activities
- CDD minus 10 days to CDD minus 3 days Working Days before CDD or on completion of following activities
- KCI3 to CDD minus 11 days Working Days before CDD or on completion of following
- KCI3 Working Days before CDD or on completion of following activities

Cancellation Charges: 1Gb/s (60 month minimum period) - before delivery
- 2 or less working days before Contractual Delivery Date
- 3 to 20 working days before Contractual Delivery Date

- 21 to 29 working days before Contractual Delivery Date
- 30 to 38 working days before Contractual Delivery Date
- 39 or more working days before Contractual Delivery Date

Termination Charges: 1Gb/s (60 month minimum period) - after delivery

- <1 Years after Contractual Delivery Date
- <2 Years after Contractual Delivery Date
- <3 Years after Contractual Delivery Date
- <4 Years after Contractual Delivery Date
- <5 Years after Contractual Delivery Date

EAD Modify Circuit Shift Charges

- Shift - Internal. Internal Shift of an EAD local end within the existing building.
- Shift - External Resite. Resiting of an EAD local end in another building served by the same local serving exchange
- Shift - External Rearrange. Rearranging an EAD local end in another building served by a different local serving exchange

Backhaul Extension Service (BES)

BES/BES Daisy Chain 100MBit/s and above Connection - Prices are per end

- BES 2500
- BES 10000

BES 100MBit/s and above Rental Charges - Prices are per end

- BES 100
- BES 155
- BES 622
- BES 1000
- BES 2500
- BES 10000
- BES 1000- Extended Reach

BES Daisy Chain 100MBit/s and above Rental Charges - Prices are per end

- BES 100
- BES 155
- BES 622
- BES 1000
- BES 2500
- BES 10000

BES 100MBit/s and above Term Rental Charges
Charges are per end for 3 year and 5 year minimum annual rental for the following services:

- BES 1000
- BES 2500
- BES 10000
- BES 1000 Extended Reach

BES Daisy Chain 100MBit/s and above Term Rental Charges - Prices are per end
Charges are per end for 3 year and 5 year minimum annual rental for the following services:

- BES 1000
- BES 2500
- BES 10000

BES/BES Daisy Chain 10MBit/s Connection and Rental Charges - Prices are per end

- BES 10 annual rental price per end
- BES 10 daisy chain rental price per end

Main Link Charges - Prices are per metre or part thereof

- Main link per metre or part thereof (>0m up to 25,000 metres) - up to and including 1Gb/s annual rental
- Main link per metre or part thereof (>0m up to 25,000 metres) - over 1Gb/s connection charge
- Main link per metre or part thereof (>0m up to 25,000 metres) - over 1Gb/s annual rental
- Main link per metre or part thereof (>0m up to 25,000 metres) - over 1Gb/s 3 year minimum annual rental
- Main link per metre or part thereof (>0m up to 25,000 metres) - over 1Gb/s 5 year minimum annual rental

Circuit Upgrades (pricing includes engineering visit)

- BES 10 to BES 100
- BES 10 to BES 155
- BES 10 to BES 622
- BES 10 to BES 1000
- BES 100 to BES 155
- BES 100 to BES 622
- BES 100 to BES 1000
- BES 100 36 month min period to BES 2500 36 month min period

- BES 100 36 month min period to BES 2500 60 month min period
- BES 100 36 month min period to BES 10000 36 month min period
- BES 100 36 month min period to BES 10000 60 month min period
- BES 100 60 month min period to BES 2500 36 month min period
- BES 100 60 month min period to BES 2500 60 month min period
- BES 100 60 month min period to BES 10000 36 month min period
- BES 100 60 month min period to BES 10000 60 month min period
- BES 155 to BES 622
- BES 155 to BES 1000
- BES 622 to BES 1000
- BES 1000 36 month min period to BES 2500 36 month min period
- BES 1000 36 month min period to BES 2500 60 month min period
- BES 1000 36 month min period to BES 10000 36 month min period
- BES 1000 36 month min period to BES 10000 60 month min period
- BES 1000 60 month min period to BES 2500 36 month min period
- BES 1000 60 month min period to BES 2500 60 month min period
- BES 1000 60 month min period to BES 10000 36 month min period
- BES 1000 60 month min period to BES 10000 60 month min period

Circuit Migration Charges

- Successful Circuit Migration to BES (For LES10 - LES1000)
- Failed Circuit Migration to BES (For LES10 - LES1000
- Successful Circuit Migration to BES (For all other LES circuits)
- Failed Circuit Migration to BES (For all other LES circuits)
- BES 100 36 month min period migration to OSA 2.48Gb 36 month min period option
- BES 100 36 month min period migration to OSA 2.48Gb 60 month min period option
- BES 100 36 month min period migration to OSA 10Gb 36 month min period option
- BES 100 36 month min period migration to OSA 10Gb 60 month min period option
- BES 100 60 month min period migration to OSA 2.48Gb 36 month min period option
- BES 100 60 month min period migration to OSA 2.48Gb 60 month min period option
- BES 100 60 month min period migration to OSA 10Gb 36 month min period option
- BES 100 60 month min period migration to OSA 10Gb 60 month min period option
- BES 1000 36 month min period migration to OSA 2.48Gb 36 month min period option
- BES 1000 36 month min period migration to OSA 2.48Gb 60 month min period option
- BES 1000 36 month min period migration to OSA 10Gb 36 month min period option
- BES 1000 36 month min period migration to OSA 10Gb 60 month min period option

- BES 1000 60 month min period migration to OSA 2.48Gb 36 month min period option
- BES 1000 60 month min period migration to OSA 2.48Gb 60 month min period option
- BES 1000 60 month min period migration to OSA 10Gb 36 month min period option
- BES 1000 60 month min period migration to OSA 10Gb 60 month min period option

BES Circuit Shift Charges

- Shift - Internal. Internal Shift of a BES local end within the existing building
- Shift - External Resite. Resiting of a BES local end in another building served by the same local serving exchange
- Shift - External Rearrange. Rearranging a BES local end in another building served by a different local serving exchange

Resilient Option 2
Charges for annual rental, 3 year and 5 year minimum annual rentals for the following services:

- Backhaul Extension Services Generic Resilience Facility fee per circuit (all bandwidths)
- Main link per metre or part thereof - up to and including 1Gb/s
- Main link per metre or part thereof - over 1Gb/s
- Resilience link per metre or part thereof - up to and including 1Gb/s
- Resilience link per metre or part thereof - over 1Gb/s

Cancellation Charges

- CDD - 2 days
- CDD - 10 days - CDD -3 days
- KCI3 - CDD minus 11 days

Bulk Transport Link ('BTL') for 1Gbps
Charges are for 5 year minimum period option only for the following services:

- Migration from BES to BTL Hub Module 1 Migration
- Migration from BES to BTL Hub Module 1 Rental per Annum
- Migration from BES to BTL Hub Module 2,3,4 Migration
- Migration from BES to BTL Hub Module 2,3,4 Rental per Annum
- Migration Charge from BES to BTL Main Link
- Migration Charge from BES to BTL Main Link Rental per Annum

Point of Presence (PoP) charges for 5 year minimum period option only for the following services:

- Migration from BES to BTL PoP Module 1 Migration
- Migration from BES to BTL PoP Module 1 Rental per Annum

- Migration from BES to BTL PoP Module 2,3,4 Migration
- Migration from BES to BTL PoP Module 2,3,4 Rental per Annum

Additional charges: Interfaces

- S Mode Interface 1000 Base LX (1310nm Single Mode). Reach approx 10km
- S Mode Interface used on customer PoP sites

Cancellation Charges

- 2 or less working days before Contractual Delivery Date
- 3 > 19 working days before Contractual Delivery Date
- 20 to 22 working days before Contractual Delivery Date
- 23 to 25 working days before Contractual Delivery Date
- 26 or more working days before Contractual Delivery Date

Interpretation

Except insofar as the context otherwise requires, the terms or descriptions of products and/or services used in this Annex shall be construed as having the same meaning as those provided by the Dominant Provider on its website for definitions and explanations of its products in addition to future updates. These are currently found as follows:

- Products and/or services within the "**Ethernet Services Basket**", being the products and/or services in Sections 1 to 2 of this Annex, please refer to http://www.openreach.co.uk/orpg/home/home.do
- Specifically:
    - For EAD, please refer to http://www.openreach.co.uk/orpg/home/products/ethernetservices/ethernetaccessdirect/ead.do
    - For EBD, please refer to http://www.openreach.co.uk/orpg/home/products/ethernetservices/ethernetbackhauldirect/ebd.do
    - For BTL, please refer to http://www.openreach.co.uk/orpg/home/products/ethernetservices/bulktransportlink/bulktransportlink.do
    - For WES/WEES, please refer to http://www.openreach.co.uk/orpg/home/products/ethernetservices/wholesaleextensionservices/wes.do
    - For BES, please refer to http://www.openreach.co.uk/orpg/home/products/ethernetservices/backhaulextensionservices/bes.do

- For Openreach Network Backhaul Service, please refer to http://www.openreach.co.uk/orpg/home/products/ethernetservices/openreachnetworkbackhaulservices/onbs.do
- For Backhaul Network Service, please refer to http://www.openreach.co.uk/orpg/home/products/ethernetservices/backhaulnetworkservices/bns.do
- For Cablelink, please refer to http://www.openreach.co.uk/orpg/home/products/ethernetservices/cablelink/cablelink.do

Part 6: Condition 5.4

Controls of Retail Analogue Services Basket

(a) Subject to paragraph **(b)**, the Dominant Provider shall take all reasonable steps to secure that, at the end of each Relevant Year, the Percentage Change (as determined in accordance with paragraph **(c)**) in the aggregate of charges for all of the products and services in the Retail Analogue Services Basket is not more than the Controlling Percentage (as determined in accordance with paragraph **(d)**).

(b) For the purpose of complying with paragraph **(a)**, the Dominant Provider shall take all reasonable steps to secure that the revenue it accrues as a result of all relevant individual charge changes during any Relevant Year shall be no more than that which it would have accrued had it made a single charge change equal to the Controlling Percentage on the first day of the Relevant Year.

For the avoidance of doubt, this obligation shall be deemed to be satisfied where the following formula is satisfied:

$$\sum_{i=1}^{n}\left[W_1 R_i \frac{\left(p_{1,i} - p_{0,i}\right)}{p_{0,i}} + W_t R_i \frac{\left(p_{t,i} - p_{0,i}\right)}{p_{0,i}}\right] \leq TRC$$

where:

n is the number of products and services in the specified category (i.e. the basket in question);

$p_{0,i}$ save for the First Relevant Year of the control, is the published charge made by the Dominant Provider for the specific product or service, i, at the beginning of the Relevant Year excluding any discounts offered by the Dominant Provider;

$p_{1,i}$ is the published charge after the first change in charge in the Relevant Year excluding any discounts offered by the Dominant Provider;

$p_{t,i}$ is the published charge made by the Dominant Provider for the specific product or service, i, at time, t, during the Relevant Year excluding any discounts offered by the Dominant Provider;

R_i is the sum of the revenue accrued during the Relevant Financial Year in respect of the specific product or service, i, and the revenue accrued during the Relevant Financial Year in respect of equivalent products or services provided by the Dominant Provider to itself, calculated to exclude any discounts offered by the Dominant Provider;

W_1 is the proportion of the Relevant Year in which the first charge change applies, calculated by the number of days during which the charge was in effect and dividing by 365 (366 in a leap year);

W_t is the proportion of the Relevant Year in which each subsequent charge, p_t, is in effect, calculated by the number of days during which the charge is in effect and dividing by 365 (366 in a leap year); and

TRC is the target revenue change required in the Relevant Year to achieve compliance with paragraph **(a)**, calculated by the Controlling Percentage multiplied by the revenue accrued during the Relevant Financial Year.

(c) The Percentage Change for the purpose of the Retail Analogue Services Basket specified in paragraph **(a)** shall be calculated by employing the following formula:

$$C_t = \frac{\sum_{i=1}^{n}\left[R_i \frac{(p_{t,i} - p_{0,i})}{p_{0,i}}\right]}{\sum_{i=1}^{n} R_i}$$

where:

C_t is the Percentage Change in the aggregate of charges for the products and/or services in the specified category (i.e. the basket in question) at the end of the Relevant Year;

n is as defined in paragraph **(b)**;

R_i is as defined in paragraph **(b)**;

$p_{0,i}$ is as defined in paragraph **(b)**; and

$p_{t,i}$ is as defined in paragraph **(b)**.

(d) Subject to paragraphs **(e)** and **(f)**, the Controlling Percentage in relation to any Relevant Year means for the Retail Analogue Services Basket specified in paragraph **(a)**, RPI increased by [X][149] percentage points.

Calculation of Carry Forward Percentage

(e) Where the Percentage Change in any Relevant Year is less than the Controlling Percentage, then for the purpose of the Retail Analogue Services Basket specified in paragraph **(a)** the Controlling Percentage for the following Relevant Year shall be determined in accordance with paragraph **(d)**, but increased by the amount of such deficiency.

(f) Where the Percentage Change in any Relevant Year is more than the Controlling Percentage, then for the purpose the Retail Analogue Services Basket specified in paragraph **(a)** the Controlling Percentage for the following Relevant Year shall be determined in accordance with paragraph **(d)**, but decreased by the amount of such excess.

Controls of sub-cap

(g) In the case of the Retail Analogue Sub-cap Services, the Dominant Provider shall also and, in any event, take all reasonable steps to secure that, during each Relevant Year, the Percentage Change in each of the charges for each and every Retail

[149] [*Ofcom is consulting on the appropriate value of X within a range of 0% and 6.5%, as discussed in Section 9 of the consultation document attached to this Notification*]

Analogue Sub-cap Service is not more than RPI increased by 10[150] percentage points.

For the purpose of this paragraph **(g)**, the Percentage Change shall be calculated by employing the formula set out in paragraph **(h)**.

(h) The Percentage Change for the purpose of the Retail Analogue Sub-cap Services shall be calculated by employing the following formula:

$$C_t = \frac{(p_t - p_0)}{p_0}$$

where:

C_t is the Percentage Change in charges for the products and services in the sub-basket in question at a particular time *t* during the Relevant Year;

p_0 save for the First Relevant Year of the control, is the published charge made by the Dominant Provider for the specific product or service *i* at the beginning of the Relevant Year excluding any discounts offered by the Dominant Provider; and

p_t is the published charge made by the Dominant Provider for the specific product or service at the time, *t*, during the Relevant Year excluding any discounts offered by the Dominant Provider.

General provisions and interpretation

(i) Where the Dominant Provider makes a material change (other than to a charge) to any product or service which is subject to this Condition 5.4 or to the date on which its financial year ends or there is a material change in the basis of the Retail Prices Index, paragraphs **(a)** to **(h)** shall have effect subject to such reasonable adjustment to take account of the change as Ofcom may direct to be appropriate in the circumstances.

For the purposes of this paragraph, a material change to any product or service which is subject to this Condition 5.4 includes the introduction of a new product or service wholly or substantially in substitution for that existing product or service.

(j) The Dominant Provider shall record, maintain and supply to Ofcom in an electronic format, no later than three months after the end of each Relevant Year, the data necessary for Ofcom to monitor compliance of the Dominant Provider with the price control by performing the calculation of the Percentage Change. The data shall include:

i. pursuant to paragraph **(a)**, the calculated percentage change relating to the aggregate of charges for all of the products and services in the Retail Analogue Services Basket;

ii. pursuant to paragraph **(b)**, calculation of the revenue accrued as a result of all relevant individual charge charges during any Relevant Year compared to the target revenue change;

[150] [*Provisional value based on the midpoint of our consultation range for the value of X in paragraph **(d)***]

iii. all relevant data the Dominant Provider used in the calculation of the percentage change, C_t, pursuant to paragraph **(c)**, including for each specific product or service, *i:*

iv. all relevant revenues accrued during the Relevant Financial Year in respect of the specific product or service;

v. published charges made by the Dominant Provider at time, *t*, during the Relevant Year excluding any discounts offered by the Dominant Provider;

vi. the relevant published charges at the start of the Relevant Year;

vii. other data necessary for monitoring compliance with the charge control.

(k) Paragraphs **(a)** to **(j)** shall not apply to such extent as Ofcom may direct.

(l) The Dominant Provider shall comply with any direction Ofcom may make from time to time under this Condition.

Annex to Condition 5.4

Products and services subject to charge control pursuant to Condition 5.4

Section 1

Meaning of "Retail Analogue Services Basket" and "Retail Analogue Sub-cap Services"

For the purposes of Condition 5.4 the expressions "**Retail Analogue Services Basket**" and "**Retail Analogue Sub-cap Services**" shall be construed as including the following products and/or services, subject to such changes as Ofcom may direct from time to time following any proposal by the Dominant Provider to introduce a new product and/or service or withdraw or substitute one or more of these products and/or services for another (in which case this list shall be construed accordingly):

Inland Private Circuits

BT price list section 12 part 1 – Analogue Private Services

Rental Charges for:

- Analogue Standard Data and Speech (EPS21 and EPS1)
- Analogue Premier (EPS25B)
- Analogue Network (EPS3N)
- Baseband Standard and Premier (EPS9 and EPS8)
- Omnibus Standard and Premier (EPS61 and EPS72)
- Multipoint Standard and premier (EPS51 and EPS42)

- Each local end
- Baseband local end
- Main link both ends in central London zone
- Main link one or both ends outside central London zone
    - For first 15km or part
    - Over 15km
    - Per additional km or part up to 180km
    - Per additional km or part over 180km
    - Each branching point

BT price list section 12 part 2 – DealerStream and DealerInterlink

Rental Charges for:

- dealerstream 1

- dealerstream 2
- dealerstream 3
- dealerstream 4
- dealerstream 5
- dealerstream 6

BT Analogue service charges

BT price list section 31 Part 4 – Analogue Private Circuit Products

Rental charges

- BT Prime service premium Prime analogue 1020, 1021, 1022, 1030, 1031, 1040 (a), 1041, 1042, 1043, 1044 and 1045
- BT Prime service standard 3020, 3021, 3022, 3030, 3031, 3040 (a), 3041, 3042, 3043, 3044, 3045

Interface Options

- Individual circuit terminations
- Via Dealerboard Aggregate Interface (ITU-T-G.703/4)

Interpretation

Except insofar as the context otherwise requires, the terms or descriptions of products and/or services used in this Annex shall be construed as having the same meaning as those provided by the Dominant Provider on its website for definitions and explanations of its products in addition to future updates. These are currently found as follows:

- Products and/or services within the "**Retail Analogue Services Basket**" and within the meaning of "**Retail Analogue Sub-cap Services**", please refer to http://btbusiness.custhelp.com/app/answers/detail/a_id/10970/c/2915,2916,3000,3006

Part 7: Condition 5.5

Controls of sub-cap for Accommodation Services

(a) The Dominant Provider shall take all reasonable steps to secure that, during each Relevant Year, the Percentage Change in each of the charges for each and every Accommodation Service is not more than RPI reduced by 0 percentage points.

For the purpose of this paragraph **(a)**, the Percentage Change shall be calculated by employing the formula set out in paragraph **(c)**.

Controls of sub-cap for Overlapping Accommodation Services

(b) The Dominant Provider shall take all reasonable steps to secure that, in any Relevant Year, each of the charges for each and every Overlapping Accommodation Service is no more than the amount of such a charge that the Dominant Provider charges for the Overlapping Accommodation Service in question at the relevant time for the purpose of providing co-mingling services for wholesale local access or wholesale exchange line rental.

(c) The Percentage Change shall be calculated by employing the following formula:

$$C_t = \frac{(p_t - p_0)}{p_0}$$

where:

C_t is the Percentage Change in charges for the products and services in the sub-basket in question at a particular time *t* during the Relevant Year;

p_0 save for the First Relevant Year of the control, p_0 is the published charge made by the Dominant Provider for the specific product or service *i* at the beginning of the Relevant Year excluding any discounts offered by the Dominant Provider.

p_t is the published charge made by the Dominant Provider for the specific product or service at the time, *t*, during the Relevant Year excluding any discounts offered by the Dominant Provider.

General provisions and interpretation

(d) Where the Dominant Provider makes a material change (other than to a charge) to any product or service which is subject to this Condition 5.5 or to the date on which its financial year ends or there is a material change in the basis of the Retail Prices Index, paragraphs **(a)** to **(c)** shall have effect subject to such reasonable adjustment to take account of the change as Ofcom may direct to be appropriate in the circumstances.

For the purposes of this paragraph, a material change to any product or service which is subject to this Condition 5.5 includes the introduction of a new product or service wholly or substantially in substitution for that existing product or service.

(e) The Dominant Provider shall record, maintain and supply to Ofcom in an electronic format, no later than three months after the end of each Relevant Year, the data necessary for Ofcom to monitor compliance of the Dominant Provider with the price control. The data shall include:

i. pursuant to paragraph **(a)**, the calculated percentage change relating to each of the charges for each and every Accommodation Service;

ii. pursuant to paragraph **(b)**, all charges made by the Dominant Provider in the Relevant Year for each and every Overlapping Accommodation Service provided:

1. in the Relevant Markets; and
2. for the purpose of providing co-mingling services for wholesale local access or wholesale exchange line rental;

iii. all relevant data the Dominant Provider used in the calculation of the percentage change, C_t, pursuant to paragraph **(c)**, including for each specific product or service, *i:*

iv. all relevant revenues accrued during the Relevant Financial Year in respect of the specific product or service;

v. published charges made by the Dominant Provider at time, *t*, during the Relevant Year excluding any discounts offered by the Dominant Provider;

vi. the relevant published charges at the start of the Relevant Year; and

vii. other data necessary for monitoring compliance with the charge control.

(f) Paragraphs **(a)** to **(e)** shall not apply to such extent as Ofcom may direct.

(g) The Dominant Provider shall comply with any direction Ofcom may make from time to time under this Condition.

Annex to Condition 5.5

Products and services subject to charge control pursuant to Condition 5.5

Section 1

Meaning of "Accommodation Services"

For the purposes of Condition 5.5 the expressions "**Accommodation Services**" shall be construed as including the following products and/or services, subject to such changes as Ofcom may direct from time to time following any proposal by the Dominant Provider to introduce a new product and/or service or withdraw or substitute one or more of these products and/or services for another (in which case this list shall be construed accordingly):

Access Locate and Access Locate Plus
Access Locate

- Contract conversion From RANF to Access Locate. Administration charge (3)

Cablelink

- External connection charge (pull in external cable up to 24 fibres and provide internal)
- External connection charge (pull in external cable up to 48 fibre and provide internal)
- Internal cable connection charge variant 1 (room to room)
- Internal cable connection charge variant 2 (room to optical frame)
- Internal cable connection charge variant 3 (room to cable chamber splice)
- NGN Cablelink internal and external variants
- BT Cablelink (Backhaul) Link rental charge per annum
- Cancellation charge (external)
- Cancellation charge (internal)
- Optional optical patching shelf for 12 fibres

Section 2

Meaning of "Overlapping Accommodation Services"

For the purposes of Condition 5.5 the expressions "**Overlapping Accommodation Services**" shall be construed as including the following products and/or services, subject to such changes as Ofcom may direct from time to time following any proposal by the Dominant Provider to introduce a new product and/or service or withdraw or substitute one or more of these products and/or services for another (in which case this list shall be construed accordingly):

Local Loop Unbundling Pricing
Plan and build

Accommodation

- Distant location full survey

- Missed joint survey or testing appointment

Operator Equipment Room

- Co-location order rejection - no space available
- Co-location full survey

Services for Flexible Comingling Products

- Site visit charge to be allocated to all orders not in conjunction with the installation of a base product
- Co-Mingling order rejection - no space or insufficient space available
- APO Cancellation Charge
- Co-Mingling set up fee (per sq metre)
- Comingling Shared Point of Presence Administration Fee
- AC Final Distribution Rental per 10kw increment per annum (Charges will appear in billed units of decawatts (10W)
- Cooling per kw

Comingling Rack Products that are No Longer Available for New Supply - Upgrade Options

- Ancillary Service Structure upgrade from 1-3 Rack Space Units to 4-6 Rack Space Units
- Ancillary Service Structure downgrade from 4-6 Rack Space Units to 1-3 Rack Space Units
- Upgrade of existing MCU1 product to MCU2
- Upgrade of existing BBUSS3 Point Of Presence to BBUSS7 (power and space)
- Upgrade of existing BBUSS 3 Point Of Presence to B-BUSS 7 (space only)
- Downgrade of existing BBUSS 7 Point Of Presence to B-BUSS 3 (space only)
- Upgrade of existing MCU1 / MCU2 to MCU1Max / MCU2Max
- Out of Hours Connection Fee for upgrade of existing MCU1 / MCU2 to MCU1Max / MCU2Max
- Upgrade of existing MCU1 / MCU2 to MCU1MaxAux / MCU2MaxAux
- Out of Hours Connection Fee for upgrade of existing MCU1 / MCU2 to MCU1MaxAux / MCU2MaxAux

Comingling Rack products (No Longer Available for New Supply)

- Ancillary Service Structure Fixed price to service 1-3 Rack Space Units Product Withdrawn
- Ancillary Service Structure Fixed price to service 4-6 Rack Space Units Product Withdrawn

- Ancillary Service Structure Fixed price to service 7-9 Rack Space Units Product Withdrawn
- Low Capacity Unit (LCU) Product Withdrawn
- Medium Capacity Unit 1 (MCU with 1 customer rack space unit) Product Withdrawn
- Medium Capacity Unit 2 (MCU with 2 customer rack space units) Product Withdrawn
- B-BUSS3 (Broadband Britain Umbilical Services Structure with 3 customer rack space units) Product Withdrawn
- B-BUSS7 (Broadband Britain Umbilical Services Structure with 7 customer rack space units) Product Withdrawn
- MCU1 Max or MCU2 Max initial build Product Withdrawn
- Basic Single Rack Product Withdrawn
- Complete Single Rack Product Withdrawn

Services
- Security rental per sq. Metre annual rental
- Service Charge per square metre annual rental

MDF Site Access
Escorted and Unplanned Assisted Access
- BT's Normal Working Hours, planned minimum and hourly charges
- BT's Normal Working Hours, unplanned minimum and hourly charges

MDF Site Access - miscellaneous charges
- Security & Working Practices Audit Note
- BASIS (BT Assisted Site Delivery Service) fixed charge
- Site Access
- Handover
- Security partitioning per site annual rental

Power
Electricity Supply
- Provision of sub meter

Provision of Standby Epower (ESS)
- Survey for capacity upgrade
- Rental of existing capacity per kW per annum (charges will appear in billed units of decawatts (10W)) annual rental
- Provision of sub meter

Interpretation

Except insofar as the context otherwise requires, the terms or descriptions of products and/or services used in this Annex shall be construed as having the same meaning as those provided by the Dominant Provider on its website for definitions and explanations of its products in addition to future updates. These are currently found as follows:

- Products and/or services within the meaning of "**Accommodation Services**" and "**Overlapping Accommodation Services**", please refer to http://www.openreach.co.uk/orpg/home/products/llu/llu.do
- Specifically:
    - For Access Locate, please refer to http://www.openreach.co.uk/orpg/home/products/llu/accesslocate/accesslocate.do
    - For Accommodation, please refer to http://www.openreach.co.uk/orpg/home/products/llu/comingling/comingling.do

Part 8: Condition 5.6

Controls of the ECC Services

(a) Subject to paragraph **(b)**, the Dominant Provider shall take all reasonable steps to secure that, during each Relevant Year, the Percentage Change in each of the charges for each of the ECC Services is not more than GBCI reduced by 0 percentage points.

(b) The Percentage Change shall be calculated by employing the following formula:

$$C_t = \frac{(p_t - p_0)}{p_0}$$

where:

C_t is the Percentage Change in charges for the products and services in the sub-basket in question at a particular time, *t*, during the Relevant Year;

p_0 save for the First Relevant Year of the control, is the published charge made by the Dominant Provider for the specific product or service, *i*, at the beginning of the Relevant Year excluding any discounts offered by the Dominant Provider.

In the First Relevant Year of the charge control, p_0 for a specific product or service shall be the "Starting Charge Adjustment Value" as specified in Annex B to this Condition 5.6; and

p_t is the published charge made by the Dominant Provider for the specific product or service prevailing at the time, *t*, during the Relevant Year excluding any discounts offered by the Dominant Provider.

General provisions and interpretation

(c) Where the Dominant Provider makes a material change (other than to a charge) to any product or service which is subject to this Condition 5.6 or to the date on which its financial year ends, paragraphs **(a)** and **(b)** shall have effect subject to such reasonable adjustment to take account of the change as Ofcom may direct to be appropriate in the circumstances.

For the purposes of this paragraph, a material change to any product or service which is subject to this Condition 5.6 includes the introduction of a new product or service wholly or substantially in substitution for that existing product or service.

(d) The Dominant Provider shall record, maintain and supply to Ofcom in an electronic format, no later than three months after the end of each Relevant Year, the data necessary for Ofcom to monitor compliance of the Dominant Provider with the price control by performing the calculation of the Percentage Change. The data shall include:

i. pursuant to paragraph **(a)**, the calculated percentage change relating to each of the charges for each and every ECC Service;

ii. all relevant data the Dominant Provider used in the calculation of the percentage change, C_t, pursuant to paragraph **(b)**, including for each specific product or service, *i:*

iii. all relevant revenues accrued during the Relevant Financial Year in respect of the specific product or service;

iv. published charges made by the Dominant Provider at time, *t*, during the Relevant Year excluding any discounts offered by the Dominant Provider;

v. the relevant published charges at the start of the Relevant Year;

vi. other data necessary for monitoring compliance with the charge control.

(e) Paragraphs **(a)** to **(d)** shall not apply to such extent as Ofcom may direct.

(f) The Dominant Provider shall comply with any direction Ofcom may make from time to time under the Condition 5.6.

Annex A to Condition 5.6

Products and services subject to charge control pursuant to Condition 5.6

Section 1

Meaning of "ECC Services"

For the purposes of Condition 5.6 the expression "**ECC Services**" shall be construed as including the following products and/or services, subject to such changes as Ofcom may direct from time to time following any proposal by the Dominant Provider to introduce a new product and/or service or withdraw or substitute one or more of these products and/or services for another (in which case this list shall be construed accordingly):

Openreach ECCs
Openreach Price List section 4 - Service Product Pricing
Single charges

- Survey Fee/ Planning Charge. This item will only be charged if ECCs are accepted by a customer.
- Resurvey charge (additional to the first survey)
- Breaking/Drilling through each external wall
- Breaking/Drilling through each internal concrete wall
- Breaking/Drilling through each internal non-concrete wall
- Provision of each Pole
- Provision of a new footway box (Surface area up to 0.5 sqm)
- Provision of a new medium size footway box (Surface area between 0.5 sqm and 1 sqm)
- Provision of a new large size footway box (Surface area greater than 1 sqm)
- Provision of a new small carriageway box (Surface area up to 1 sqm)
- Provision of a new medium size carriageway box (Surface area between 1 sqm and 1.25 sqm)
- Provision of a new large size carriageway box (Surface area greater than 1.25 sqm)
- Cable (fibre or copper) including any jointing required

Per meter or part thereof charges

- Copper cable supplied for the customer to lay to agreed entry and termination points. (minimum 20m supply) This charge includes on site termination and jointing work by Openreach to connect and terminate the cable. If the order is for less than 40 metres then a visit charge will apply - Please See Visit Charges for details
- Directly buried cable (including any cable and wayleave costs)
- Mole ploughing cable or fibre in subduct (includes any cable and wayleave costs)
- Blown Fibre

- Blown Fibre Tubing in Duct
- Internal cabling (including Internal Blown Fibre Tubing)
- New Ductwork – Soft surface (includes wayleave costs)
- New Ductwork - Footway (includes wayleave costs)
- New Ductwork - Carriageway (includes wayleave costs)
- Trunking and tray work within end user's cartilage

Interpretation

Except insofar as the context otherwise requires, the terms or descriptions of products and/or services used in this Annex A and Annex B shall be construed as having the same meaning as those provided by the Dominant Provider on its website for definitions and explanations of its products in addition to future updates. These are currently found as follows:

- Products and/or services within the meaning of "**ECC Services**", please refer to http://www.openreach.co.uk/orpg/home/products/serviceproducts/excessconstructioncharges/excessconstructioncharges.do

Annex B to Condition 5.6

Starting Charge Adjustment Values[151] pursuant to conditions 5.6

Product and/or service	Proposed start charge (£)
Survey Fee	250
Drilling each external wall	235
Drilling each internal wall non concrete	45
Drilling each internal wall concrete	140
Cable installed into duct, buried or installed on poles including any jointing required per metre	4.30
Blown Fibre per metre	3.05
Blown fibre tubing in duct per metre	2.75
Internal cabling (including internal blown fibre tubing) per metre	5.00
New ductwork (including wayleave costs)	
- under soft surface per metre	20
- under foot way per metre	40
- under carriage way or roads per metre	80
Trunking & traywork within customer's curtilage per metre	28
New footway box small (surface area up to 0.5 sqm)	690
New footway box medium (surface area between 0.5 and 1sqm)	1,525
New footway box large (surface area greater than 1sqm)	2,630
Provision of a Small carriageway box (surface area up to 1sqm)	2,410
Provision of a medium carriageway box (surface area between 1and 1.25 sqm)	3,000
Provision of a small carriageway box (surface area above 1.25 sqm)	3,375

[151] [*Ofcom is consulting on these values, as discussed in Section 7 of the consultation document attached to this Notification*]

Annex 9

Glossary

Accumulated (HCA) depreciation
Totality of deductions made to the original purchase price of a tangible fixed asset to reflect its cumulative consumption since acquisition.

Accumulated (CCA) depreciation
Totality of deductions made to the gross replacement cost of a tangible fixed asset to reflect its cumulative consumption since acquisition.

Alternative interface symmetric broadband origination (AISBO)
A form of symmetric broadband origination service providing symmetric capacity between two sites, generally using an Ethernet IEEE 802.3 interface.

Anchor pricing
An approach that sets the upper bound for charges of existing services by reference to the cost of providing those services using existing technology. This ensures that the introduction of new technology which is intended to provide a greater range of services does not inappropriately lead to an increase in the cost of the existing services.

Ancillary services
Services that relate to the Core Rental Services and that are of an ancillary nature but which fall within markets in which BT has been found to have SMP.

Asset lives
Asset lives of each component are calculated by dividing the GRC by the depreciation charge in the base year assuming straight line depreciation.

Asset Volume Elasticity (AVE)
The percentage increase in capital costs required for a 1% increase in volume.

Asymmetric Digital Subscriber Line (ADSL)
A variant of DSL that supports higher bandwidth on downlink transmissions, i.e. from the exchange to the end user than from the end user to the exchange.

Backhaul Ethernet Services (BES)
A wholesale Ethernet service which provides high speed, point-to-point data circuits. Each one provides a secure link from a customer's premises, to a Communications Provider's Digital Subscriber Line Access Multiplexer and the Communications Provider's site.

Bandwidth
In digital telecommunications systems, the rate measured in bits per second (bit/s), at which information can be transferred.

Bulk Transport Link (BTL)
A wholesale Ethernet product which provides high capacity, resilient solution for the delivery of multiple Openreach services from an Openreach Handover Point (OHP) to a Communications Provider's site not located in a BT Local Exchange.

Capital expenditure

Spending on assets that have physical substance and are held for use in the production or supply of goods or services, for rental to others, or for administrative purposes on a continuing basis in an entity's activities.

Compound Annual Growth Rate (CAGR)
The year-on-year smoothed annualised growth rate of an investment. It can be calculated as follows: CAGR = $(\frac{Ending\ \ Value}{Beginning\ \ Value})^{(\frac{1}{number\ \ of\ years})} - 1$

Cost Volume Elasticity (CVE)
The percentage increase in operating costs for a 1% increase in volume.

Consumer price index CPI
The consumer price index (CPI) is a measure of inflation. It measures changes in the price level of **consumer goods** and **services** purchased by households. The most significant item excluded in the CPI, but included in the RPI, is mortgage interest rate payments.

Current Cost Accounting (CCA)
An accounting convention, where assets are valued and depreciated according to their current replacement cost whilst maintaining the operating or financial capital of the business entity.

Customer Sited Handover (CSH)
An interconnection between BT and another communications provider where the BT handover circuit terminates at the communications provider’s premises.

Distributed long run incremental cost (DLRIC)
The LRIC of the individual service with a share of costs which are common to other services over BT‘s core network.

Digital Private Circuit Network (DPCN)
The BT Wholesale sub 2Mbit/s aggregation and cross-connect network.

Distributed stand alone cost (DSAC)
An accounting approach estimated by adding to the DLRIC a proportionate share of the inter-increment common costs. Rather than all common costs shared by a service being allocated to the service under consideration, the common costs are instead allocated amongst all the services that share the network increment.

Equi-proportional Mark-Up (EPMU)
The application of the same percentage mark-up to the incremental costs of two or more services.

Excess Construction Charge (ECC)
A charge levied where additional construction of duct and fibre or copper is required to provide service to a customer premise.

Ethernet
A packet-based technology originally developed for and still widely used in Local Area Networks. Ethernet networking protocols are defined in IEEE 802.3 and published by the Institute of Electrical and Electronic Engineers. Developments of this technology known as Metro Ethernet or Carrier Ethernet are now being used in communications providers’ networks to provide leased line and backhaul services.

Ethernet Access Direct (EAD)

A wholesale Ethernet product which offers permanently connected, point-to-point high speed data circuits that provide a secure and un-contended access service for Communications Providers. EAD is a next generation network compatible service designed to complement Openreach's Ethernet Backhaul Direct (EBD) and Bulk Transport Link (BTL) products already offered within the Connectivity Services portfolio.

Ethernet Backhaul Direct (EBD)
A wholesale Ethernet product which offers permanently connected, point-to-point high speed data circuits that provide a secure and un-contended backhaul service for Communications Providers.

Excess Construction Charges (ECC)
A charge levied by BT where additional construction of duct and fibre or copper is required to provide service to a customer premise.

Financial capability maintenance (FCM)
The maintenance of an entity's financial capability (i.e. the amount of the shareholders' equity interest) when determining the profitability of an entity.

Fully allocated cost (FAC)
An accounting approach under which all the costs of the company are distributed between its various products and services. The fully allocated cost of a product or service may therefore include some common costs that are not directly attributable to the service.

Gbit/s
Gigabits per second (1 Gigabit = 1,000,000,000 bits) A measure of bandwidth in a digital system.

General Building Cost Index (GBCI)
A national index that measures the costs of construction work including materials and labour.

Gross Replacement Cost (GRC)
The cost of replacing an existing tangible fixed asset with an identical or substantially similar new asset having a similar production or service capacity.

HCA (historical cost accounting) depreciation
The measure of the cost in terms of its original purchase price of the economic benefits of tangible fixed assets that have been consumed during a period. Consumption includes the wearing out, using up or other reduction in the useful economic life of a tangible fixed asset whether arising from use, effluxion of time or obsolescence through either changes in technology or demand for the goods and services produced by the asset.

In Span Handover (ISH)
An interconnection between BT and another communications provider where the BT handover circuit terminates at a point between BT's premises and the communications provider's premises.

Internet Protocol (IP)
A network technology used in packed-switched networks to route packets across network nodes.

kbit/s
Kilobits per second (1 kilobit = 1,000 bits) A measure of bandwidth in a digital system.

Leased line
A permanently connected communications link between two premises dedicated to the customers' exclusive use.

Local Area Network (LAN)
A network typically linking a number of computers together within a business premise, enabling intercommunication between users and access to email, internet and intranet applications.

Local Loop Unbundling (LLU) backhaul circuit
A circuit provided by BT that enables the connection of a communications provider's DSLAM to a communications provider's point of connection with BT's SDH network.

Long Run Incremental Cost (LRIC)
The cost caused by the provision of a defined increment of output given that costs can, if necessary, be varied and that some level of output is already produced.

Modern equivalent asset (MEA)
The approach to set charges by basing costs and asset values on what is believed to be the most efficient available technology that performs the same function as the current technology.

Mean capital employed (MCE)
The mean value of the assets that contribute to a company's ability to generate revenues.

Multiple Service Access Node (MSAN)
A network access device associated with an IP-based core network that provides network interfaces for telephony, broadband and other services. MSANs are typically installed in a telephone exchange or a roadside cabinet.

Mbit/s
Megabits per second (1 Megabit = 1 million bits). A measure of bandwidth in a digital system.

Net current assets (NCA)
Total current assets less current liabilities.

Next generation access (NGA)
A term used by BT to describe a significant upgrade to the telecommunication access network replacing some or all of the copper cable with optical fibre.

Net replacement cost (NRC)
Gross replacement cost less accumulated depreciation based on gross replacement cost. An alternative is *Depreciated replacement cost (of tangible fixed assets other than property:-* The cost of replacing an existing tangible fixed asset with an identical or substantially similar new asset having a similar production or service capacity, from which appropriate deductions are made to reflect the value attributable to the remaining portion of the total useful economic life of the asset and the residual value at the end of the asset's useful economic life.

Operating capability maintenance (OCM depreciation)
The maintenance of an entity's operational capability (i.e. the capacity to produce goods and services) when determining the profitability of an entity. OCM depreciation is calculated as the sum of CCA depreciation and HCA depreciation.

Operating expenditure
Costs reflected in the profit and loss account excluding depreciation financing costs such as interest charges.

Openreach Network Backhaul Services (ONBS)
Openreach Network Backhaul Service offers connectivity between a Communications Providers equipment installed within Co-location, Netlocate or BT Locate at a BT MSAN Site, and their equipment installed within Co-location, Netlocate or BT Locate at either the nearest BT MSAN Site, BT Metro Node Site or another BT MSAN Site or Metro Node Site which is within a distance of 15 radial kilometres of the first BT MSAN/Metro Site.

Partial Private Circuit (PPC)
A generic term used to describe a category of private circuits that terminate at a point of connection between two communications providers' networks. It is therefore the provision of transparent transmission capacity between a customer's premises and a point of connection between the two communications providers' networks. It may also be termed a part leased line.

Point of Handover (POH)
A point where one communications provider interconnects with another communications provider for the purposes of connecting their networks to 3rd party customers in order to provide services to those end customers.

Radio Base Station (RBS) backhaul circuit
A circuit provided by BT that connects a mobile communications provider's base-station to the mobile communications provider's mobile switching centre.

RAV model
This model calculates the forecast asset values, depreciation and holding gains for Access Copper and Duct. The model also applies a regulatory adjustment (RAV adjustment) previously applied by Ofcom.

Regulatory asset value (RAV)
The value ascribed by Ofcom to an asset or capital employed in the relevant licensed business.

Regulatory financial statements (RFS)
The financial statements that BT is required by Ofcom to prepare, have audited and publish.

Return on capital employed (ROCE)
The ratio of accounting profit to capital employed. The measure of capital employed can be either Historic Cost Accounting (HCA) or Current Cost Accounting (CCA).

Retail price index (RPI)
A measure of inflation published monthly by the Office for National Statistics. It measures the change in the cost of a basket of retail goods and services.

Service Level Agreement (SLA)
A contract between a network service provider and a customer that specifies, usually in measurable terms, what services the network service provider will furnish.

Service Level Guarantee (SLG)
A contractual agreement specifying the compensation payable if the service provider fails to deliver the agreed service performance.

Stand Alone Cost (SAC)
An accounting approach under which the total cost incurred in providing a product is allocated to that product.

Supplementary depreciation
The additional depreciation charge to convert an HCA depreciation charge into a CCA depreciation charge.

Synchronous Digital Hierarchy (SDH)
A digital transmission standard that is widely used in communications networks and for leased lines.

Symmetric broadband origination (SBO)
A symmetric broadband origination service provides symmetric capacity from a customer's premises to an appropriate point of aggregation, generally referred to as a node, in the network hierarchy. In this context, a "customer" refers to any public electronic communications network provider or end-user.

Symmetric Digital Subscriber Line (SDSL)
A DSL variant that allows broadband signals to be transmitted at the same rate from end user to exchange as from exchange to end user.

Traditional interface symmetric broadband origination (TISBO)
A form of symmetric broadband origination service providing symmetric capacity from a customer's premises to an appropriate point of aggregation in the network hierarchy, using a ITU G.703 interface.

Virtual Private Network (VPN)
A technology allowing users to make inter-site connections over a public telecommunications network that is software partitioned to emulate the service offered by a physically distinct private network.

Wave Division Multiplex (WDM)
An optical frequency division multiplexing transmission technology that enables multiple high capacity circuits, to share an optical fibre pair by modulating each on a different optical wavelength.

Weighted average cost of capital (WACC)
The rate that a company is expected to pay on average to all its security holders to finance its assets.

Wholesale Extension Service (WES)
A BT wholesale Ethernet product that can be used to link a customer premise to a node in a communications network.

Wholesale end-to-end service (WEES)
High capacity, point-to-point Ethernet service for connection between two customer's sites.

21st Century Network (21CN)
BT's next generation network upgrade.

Annex 10

Sources of evidence

Introduction

A10.1 We have noted throughout the consultation the evidence we have relied upon in relation to our findings and how we have relied upon that evidence. This Annex lists the main sources of that evidence. We also list all responses to our various consultations and to our various notices under section 135 of the Communications Act 2003.

A10.2 Whilst the Annex lists the main evidence we have relied upon, the list is for convenience only and is not intended to be exhaustive.

Ofcom Documents

A10.3 Oftel's market review guidelines: criteria for the assessment of significant market power, Issued by the Director General of Telecommunications, August 2002. www.ofcom.org.uk/static/archive/oftel/publications/about_oftel/2002/smpg0802.htm

A10.4 Imposing access obligations under the new EU Directives, September 2002. http://www.ofcom.org.uk/static/archive/oftel/publications/ind_guidelines/acce0902.htm

A10.5 Valuing copper access, Final Statement, August 2005, http://stakeholders.ofcom.org.uk/binaries/consultations/copper/statement/statement.pdf

A10.6 Variations to BT's Undertakings under the Enterprise Act 2002 in respect of BT's NGN, Space and Power and OSS separation, Statement, October 2008. http://stakeholders.ofcom.org.uk/binaries/consultations/variations_bt/statement/statement071008.pdf

A10.7 Variation to and exemption from BT's Undertakings under the Enterprise Act 2002 related to IPStream in certain geographic markets and Wavestream National, Statement, December 2008. http://stakeholders.ofcom.org.uk/binaries/telecoms/policy/bt/wavestream1208.pdf

A10.8 Business Connectivity Market Review, Review of the retail leased lines, wholesale symmetric broadband origination and wholesale trunk segments markets, Statement and Consultation, December 2008. http://stakeholders.ofcom.org.uk/binaries/consultations/bcmr08/summary/bcmr08.pdf

A10.9 Leased Lines Charge Control, A new charge control framework for wholesale traditional interface and alternative interface products and services, Consultation, December 2008. http://stakeholders.ofcom.org.uk/binaries/consultations/llcc/summary/leasedlines.pdf

A10.10 Business Connectivity Market Review, Review of the retail leased lines, wholesale symmetric broadband origination and wholesale trunk segments markets, Statement, February 2009.

http://stakeholders.ofcom.org.uk/binaries/consultations/bcmr08/statement/statement.pdf

A10.11 Replicability and the regulation of BT's retail low bandwidth digital leased lines, Draft Consent, Consultation, June 2009. http://stakeholders.ofcom.org.uk/consultations/low_bandwidth/

A10.12 Leased Lines Charge Control, A new charge control framework for wholesale traditional interface and alternative interface products and services, Statement, July 2009. http://stakeholders.ofcom.org.uk/consultations/llcc/statement/

A10.13 Re-prioritising BT's remaining Undertakings commitments on information systems separation, Statement, September 2009. http://stakeholders.ofcom.org.uk/consultations/btundertakings/statement/

A10.14 Business Connectivity Market Review, Review of the retail leased lines, wholesale symmetric broadband origination and wholesale trunk segments markets, Statement, February 2009. http://stakeholders.ofcom.org.uk/binaries/consultations/bcmr08/statement/statement.pdf

A10.15 Review of the wholesale broadband access markets, Consultation on market definition, market power determinations and remedies, March 2010. http://stakeholders.ofcom.org.uk/binaries/consultations/wba/summary/wbacondoc.pdf

A10.16 Review of the wholesale broadband access markets, Second consultation on market definition, market power determinations and remedies, Consultation, August 2010. http://stakeholders.ofcom.org.uk/binaries/consultations/wholesale-broadband-markets/summary/WBA_condoc.pdf

A10.17 Leased Lines Charge Control, Adoption of Revised SMP Services Conditions following the Competition Appeal Tribunal's Directions of 20 September 2010, September 2010. http://stakeholders.ofcom.org.uk/binaries/consultations/llcc/statement/LLCC_decision_final.pdf

A10.18 Review of the wholesale local access market, Statement on market definition, market power determinations and remedies, Statement, October 2010. http://stakeholders.ofcom.org.uk/binaries/consultations/wla/statement/WLA_statement.pdf

A10.19 Exemption from BT's Undertakings under the Enterprise Act 2002 related to Wavestream National, Statement, December 2010. http://stakeholders.ofcom.org.uk/binaries/consultations/bt-wavestream/statement/wavestream-statement.pdf

A10.20 Pensions Review, Statement, December 2010, http://stakeholders.ofcom.org.uk/consultations/btpensions/statement/

A10.21 Proposals for WBA charge control, Consultation, January 2011, http://stakeholders.ofcom.org.uk/binaries/consultations/823069/summary/condoc.pdf

A10.22 Changes to BT and KCOM's regulatory and financial reporting 2010/11 update, Consultation, February 2011. http://stakeholders.ofcom.org.uk/consultations/bt-kcom-reporting/

A10.23 Wholesale charges for Number Translation Services & Premium Rate Services, Consultation, February 2011, http://stakeholders.ofcom.org.uk/binaries/consultations/nts-retail-uplift/summary/nts-retail-uplift.pdf

A10.24 Charge control review for LLU and WLR services, Consultation, March 2011, http://stakeholders.ofcom.org.uk/consultations/wlr-cc-2011/?a=0

A10.25 Business Connectivity Market Review, Call for Inputs, Consultation, April 2011. http://stakeholders.ofcom.org.uk/consultations/bcmr-inputs/?a=0

A10.26 Business Connectivity Market Review - Renewal of BT's analogue and low bandwidth digital leased lines undertakings, Statement, May 2011. http://stakeholders.ofcom.org.uk/consultations/bcmr08/renewal/

A10.27 WBA Charge Control, Statement, July 2011, http://stakeholders.ofcom.org.uk/binaries/consultations/823069/statement/statement.pdf

A10.28 LLCC PPC Points of Handover pricing review, Final Statement on modification of SMP Conditions, September 2011. http://stakeholders.ofcom.org.uk/binaries/consultations/revision-points-handover-pricing/statement/final-statement.pdf

A10.29 Charge control review for LLU and WLR services, Statement, February 2012, http://stakeholders.ofcom.org.uk/consultations/llu-wlr-further-consultation/statement

A10.30 Charge control review for LLU and WLR services, Statement, March 2012, http://stakeholders.ofcom.org.uk/consultations/wlr-cc-2011/statement-march2012/

A10.31 Price controls for wholesale ISDN30 services, April 2012, http://stakeholders.ofcom.org.uk/consultations/isdn30-2011/summary

A10.32 The Business Connectivity Market Review Consultation, Review of the retail leased lines, wholesale symmetric broadband origination and wholesale trunk segments markets, 18 June 2012, http://stakeholders.ofcom.org.uk/consultations/business-connectivity-mr/

UK Legislation

A10.33 The Communications Act 2003, as amended. http://www.legislation.gov.uk/ukpga/2003/21/contents

A10.34 The Privacy and Electronic Communications (EC Directive) Regulations 2003. http://www.legislation.gov.uk/uksi/2003/2426/contents/made

A10.35 The Electronic Communications and Wireless Telegraphy Regulations 2011. http://www.legislation.gov.uk/uksi/2011/2949/made?view=plain

A10.36 The Competition Act 1998. http://www.legislation.gov.uk/ukpga/1998/41/contents

A10.37 The Enterprise Act 2002. http://www.legislation.gov.uk/ukpga/2002/40/contents

Competition Appeal Tribunal Documents

A10.38 Cable & Wireless UK supported by Verizon UK Limited v Office of Communications supported by British Telecommunications PLC, Case No: 1112/3/3/09 – September 2010. http://www.catribunal.org.uk/237-4334/1112-3-3-09-Cable--Wireless-UK.html

http://www.catribunal.org.uk/files/1112_Cable_Wireless_Ruling_200910.pdf

A10.39 Cable & Wireless UK v Office of Communications (Leased Lines Charge Control), Case number 1112/3/3/09, 20 September 2010, http://www.catribunal.org.uk/237-4334/1112-3-3-09-Cable--Wireless-UK.html

A10.40 British Telecommunications plc (Wholesale Broadband Access Charge Control) v Office of Communications, Case number 1187/3/3/11, http://www.catribunal.org.uk/237-7278/1187-3-3-11-British-Telecommunications-plc-Wholesale-Broadband-Access-Charge-Control.html

A10.41 The Carphone Warehouse Group Plc v Office of Communications (Local Loop Unbundling), Case 1111/3/3/09, http://www.catribunal.org.uk/237-4154/1111-3-3-09-The-Carphone-Warehouse-Group-Plc.html

Competition Commission Determination

A10.42 Competition Commission Determination, Reference under section 193 of the Communications Act 2003, Cable & Wireless UK v Office of Communications, Case 1112/3/3/09, June 2010, http://www.competition-commission.org.uk/appeals/communications_act/final_determination_excised_version_for_publication.pdf

EC Documents

A10.43 The Treaty of the European Union and the Treaty establishing the European Community (Consolidated Versions). http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:C:2006:321E:0001:0331:EN:PDF

A10.44 Commission guidelines on market analysis and the assessment of significant market power under the Community regulatory framework for electronic communications networks and services (2002/C 165/03), 11.7.2002. http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:C:2002:165:0006:0031:EN:PDF

A10.45 Commission Recommendation of 11 February 2003 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 communication networks and services, (2003/311/EC). http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2003:114:0045:0045:EN:PDF

A10.46 Commission Recommendation of 25 March 2005 on the provision of leased lines in the European Union Part 2 - Pricing aspects of wholesale leased line part circuits (C(2005) 951/1 final) http://ec.europa.eu/information_society/policy/ecomm/doc/library/recomm_guidelines/leased_lines/expmem_rec_ll_part2_en.pdf

A10.47 Commission Recommendation of 17 December 2007 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). http://eur-lex.europa.eu/LexUriServ/site/en/oj/2007/l_344/l_34420071228en00650069.pdf

A10.48 Commission Staff Working Document, Accompanying document to the 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 {(C(2007) 5406)}. http://ec.europa.eu/information_society/policy/ecomm/doc/library/proposals/sec2007_1483_final.pdf

A10.49 Directive 2002/21/EC of the European Parliament and of the Council of 7 March 2002 on a common regulatory framework for electronic communications networks and services (Framework Directive). http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2002:108:0033:0033:EN:PDF

A10.50 Directive 2002/19/EC of the European Parliament and of the Council of 7 March 2002 on access to, and interconnection of, electronic communications networks and associated facilities (Access Directive). http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2002:108:0007:0007:EN:PDF

A10.51 Directive 2002/20/EC of the European Parliament and of the Council of 7 March 2002 on the authorisation of electronic communications networks and services (Authorisation Directive). http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2002:108:0021:0021:EN:PDF

A10.52 Directive 2002/22/EC of the European Parliament and of the Council of 7 March 2002 on universal service and users' rights relating to electronic communications networks and services (Universal Service Directive). http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2002:108:0051:0051:EN:PDF

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A10.56 ERG Common Position on Geographic Aspects of Market Analysis (definition and remedies), ERG (08) 20 final CP Geog Aspects 081016, October 2008. http://erg.ec.europa.eu/doc/publications/erg_08_20_final_cp_geog_aspects_081016.pdf

A10.57 Revised ERG Working paper on the SMP concept for the new regulatory framework, ERG (03) 09rev3, September 2005. http://erg.eu.int/doc/publications/public_hearing_concept_smp/erg_03_09rev3_smp_common_concept.pdf

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A10.62 KPMG, Efficiency Review of BT Openreach, March 2010, http://stakeholders.ofcom.org.uk/binaries/consultations/wlr-cc-2011/annexes/Efficiency_Review_Report.PDF

A10.63 KPMG, Leased Line Charge Control, Scoping Report, 17 January 2012

A10.64 NERA, The comparative efficiency of BT Openreach, A report for Ofcom, 17 March 2008, http://stakeholders.ofcom.org.uk/binaries/consultations/llcc/annexes/efficiency.pdf

A10.65 NERA, Comments on the Deloitte paper on "the efficiency of BT's network operations", 6 May 2008, http://stakeholders.ofcom.org.uk/binaries/consultations/llcc/annexes/operations.pdf

A10.66 Deloitte, WBA consultation response, 29 March 2011, http://stakeholders.ofcom.org.uk/binaries/consultations/823069/responses/BT2.pdf

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A10.68 Deloitte, Analysis of the Efficiency of BT's Regulated Operations, A report for BT, 16 February 2012.

A10.69 Dimson, Marsh and Staunton, Credit Suisse Global Investment Returns Sourcebook 2011, Credit Suisse Research Institute.

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A10.70 Responses to the Business Connectivity Market Review – Call for Inputs – April 2011. http://stakeholders.ofcom.org.uk/consultations/bcmr-inputs/?showResponses=true&pageNum=1#responses

Information Requests

A10.71 We issued a series of information requests and notices under section 135 of the Communications Act 2003, requiring various CPs to provide specified information. These information requests and the responses received are listed below.

A10.72 Information regarding the LLCC analysis provided by [✂].

A10.73 Information regarding the LLCC analysis provided by [✂].

A10.74 First Notice requiring the provision of specified information under Section 135 of the Communications Act 2003, of 1 July 2011. Information received from:

BT Group plc.

A10.75 Second Formal Notice requiring the provision of specified information under Section 135 of the Communications Act 2003, of 16 December 2011. Information received from:

BT Wholesale.

A10.76 Second Formal Notice requiring the provision of specified information under Section 135 of the Communications Act 2003, of 29 March 2012. Information received from:

Openreach.

A10.77 Final Notice requiring the provision of specified information under Section 135 of the Communications Act 2003 regarding Ofcom's Leased Lines Charge Control consultation of 21 May 2012. Information received from:

BT Wholesale.

A10.78 Final Formal Notice requiring the provision of specified information under Section 135 of the Communications Act 2003 regarding Ofcom's Leased Lines Charge Control consultation of 25 May 2012. Information received from:

Openreach.

A10.79 Formal Notice requiring the provision of specified information under Section 135 of the Communications Act 2003, of 4 April 2012. Information received from :

Openreach.

Other BT Information

A10.80 http://www.bt.com/pricing/current/Excess_Construction_boo/2-1319_d0e1.htm

A10.81 BT Group plc Regulatory financial statements, http://www.btplc.com/Thegroup/RegulatoryandPublicaffairs/Financialstatements/index.htm

A10.82 BT Group plc Current Cost Financial Statements for 2011 including Openreach, Undertakings, http://www.btplc.com/Thegroup/RegulatoryandPublicaffairs/Financialstatements/2011/CurrentCostFinancialStatements2011.pdf.

A10.83 BT Wholesale Catalogue 2011, http://www.btplc.com/Thegroup/RegulatoryandPublicaffairs/Financialstatements/2011/BTWholesaleCatalogue2011.pdf

A10.84 BT Group plc Detailed Attribution Methods (DAM) 2011, http://www.btplc.com/Thegroup/RegulatoryandPublicaffairs/Financialstatements/2011/DetailedAttributionMethods2011.pdf

A10.85 PPC charges, December 2011, https://www.btwholesale.com/pages/downloads/service_and_support/pricing_information/carrier_price_list/browsable_carrier_price_list/section_b3/B8.03.rtf

A10.86 BT Wholesale, price list, https://www.btwholesale.com/pages/static/Library/Pricing_and_Contractual_Information/carrier_price_list/cpl_sectionb8partialprivatecircuits.htm

A10.87 BT Wholesale, BT Datastream, https://www.btwholesale.com/pages/static/Products/Broadband/BT_Datastream/featuresandbenefits.htm

A10.88 21CN Deployment Strategy, 13 January 2012, https://www.btwholesale.com/shared/document/21CN_Consult21/c21_MG_015_DSP_Jan12_Issue17.pdf

A10.89 Quarterly update webcall on BT's 21CN programme, January 2012, https://www.btwholesale.com/pages/downloads/21_Century_Network_Community/21CN_quarterly_webcall_%20220110.ppt

A10.90 ETH004/11 Withdrawal of WES, WEES and BES products (certain bandwidths) from new supply, 31 January 2011, https://www.openreach.co.uk/orpg/home/updates/briefings/ethernetservicesbriefings/ethernetservicesbriefingsarticles/eth00411.do

A10.91 Time Related Charges, http://www.openreach.co.uk/orpg/home/products/serviceproducts/timerelatedcharges/timerelatedcharges/downloads/TRCs.pdf.

A10.92 ETH009/12 Technology migration from WES WEES BES to EAD launch pricing, http://www.openreach.co.uk/orpg/home/updates/briefings/ethernetservicesbriefings/ethernetservicesbriefingsarticles/eth00912.do

A10.93 Withdrawal of WES, WEES and BES
http://www.openreach.co.uk/orpg/home/products/ethernetservices/wholesaleextensionservices/wes/downloads/WES_BES_WEES_withdrawal_fact_sheet.pdf

A10.94 Excess Construction Charges,
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A10.97 EIP milestones,
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A10.98 ETH017/11 WES, WEES, BES Withdrawal from new supply : Reminder and document updates,
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A10.99 Openreach Pricing,
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A10.101 The General Building Cost Index http://www.bcis.co.uk/construction

A10.102 Office of National Statistics, Consumer Price Indices
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