



Business Connectivity Market Review – Volume II

Review of competition in the provision of leased lines

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Section 1

Summary

- 1.1 We are imposing the charge controls set out in Table 1.1 below on leased lines services.
- 1.2 As set out in Volume I, Section 15, we estimate that approximately £1bn of BT's annual revenues will be covered by the charge controls proposed in this statement. The combined effect of the proposed controls will result in a reduction of approximately £800m in revenues over the control period, with reductions more heavily weighted in the first year of the control due to the adoption of starting charge adjustments.

Table 1.1: Summary of the controls and starting charge adjustments

Overall cap (value of X)	Additional sub-baskets and sub-caps	BT product name to which sub-basket or sub-cap applies	Starting charge adjustment	Starting charge adjustment - sub-baskets and sub-caps
Ethernet basket				
CPI-13.25%¹	1Gbit/s Ethernet services which do not require co-location at a BT main fibre exchange (CPI-6.75%)	1Gbit/s EAD and EAD LA ²	-12%	1Gbit/s EAD (-12%)
	EAD distance related charges (where applicable) ³ (CPI-6.75%)	EAD Main link, WES/WEES, BNS, ONBS and BES Main Link charges	-12%	Main link (-12%)
	Interconnect charges levied on CPs to connect to BT network and Cablelink services (CPI-13.25%)	Bulk Transport Link (BTL), Cablelink	-12%	Interconnection services and Cablelink (-12%)
	Ethernet rental sub-basket (CPI-CPI)	EAD and EBD rental charges with an associated connection charge		
	Sub-cap on all charges (CPI-CPI)	All Ethernet Services ⁴		
TI basket				
CPI-3.5%	2Mbit/s services used by mobile operators for mobile site connectivity (CPI-3.5%)	2Mbit/s Radio Backhaul Services (RBS), NetStream 16 Longline and SiteConnect	-9%	2Mbit/s RBS, NetStream 16 Longline and SiteConnect (-9%)
	Sub-cap on interconnection services (CPI-CPI)	PPC and RBS point of handover charges		
	Sub-cap on all non-interconnection charges (CPI+8%)	All TI services (excluding interconnection services)		
Accommodation services i.e. to rent space in BT exchanges				
CPI-0% on Access Locate Administration Fee⁵	None	Access Locate Administration Fee	None	None
Excess construction charges (ECCs)				
Contractor ECCs	Basis of charges obligation - Contractor	Construction activities that Openreach provides	None	None

¹ CPI refers to the amount of change in the Consumer Prices Index.

² EAD stands for Ethernet Access Direct. This includes all variants of 1Gbit/s EAD and EAD LA services.

³ An EAD charge has two components: a local access charge plus a distance related charge.

⁴ Except charges that fall within the Ethernet rental sub-basket.

⁵ We have decided to treat the Ethernet and TI accommodation products that overlap with LLU Co-Mingling products the same as the LLU Co-Mingling products. The June 2014 FAMR Statement's charge control for the Co-Mingling (New Provides and Rentals) basket continue to apply regardless of whether they are used by CPs for leased line products or for LLU

	ECCs are based on the charge paid by BT to contractor(s), plus BT's relevant incremental costs, plus an appropriate mark-up for common costs.	through an external contractor		
Direct ECCs				
CPI-18.75% for blown fibre		Fibre installation using blown fibre technique	None	None
CPI+17.25% for cable		Installation of copper or fibre cables		
CPI+8.75% for blown fibre tubing in duct		Installation of blown fibre tubing in ducts		
CPI+11.75% for internal cabling		Internal cabling work		
CPI-3.25% for survey fee/planning charge		Survey fees and planning charges		
Ethernet Time Related Charges (TRCs)				
-0.15%	None	All relevant Ethernet TRCs ⁶	None	None

Source: Ofcom

⁶ See Table 8.3, in Section 8, Volume I

Section 2

Introduction

Scope of this Volume

- 2.1 This Volume sets out the detail of our decision to set new charge controls, including the nature, form, duration and means of derivation of the controls. In Volume I we have set out our decision that charge controls are necessary as a remedy.
- 2.2 In this section we:
- summarise the current leased line charge controls (the 2013 LLCC)⁷ that we imposed on BT in 2013;
 - summarise the consultation process we have gone through in order to arrive at our decisions for this statement⁸; and
 - set out the structure of the remainder of this Volume and the associated annexes.

The 2013 LLCC

- 2.3 In the March 2013 BCMR Statement, and also in previous reviews, we imposed charge controls on BT's leased lines services to address the risks of a price distortion that may give rise to adverse effects. In the March 2013 BCMR Statement we implemented charge controls with two separate service baskets for wholesale services:
- TI – covering low, medium and high bandwidth services outside the Western, Eastern, Central and East London Area (WECLA)⁹, low bandwidth services within the WECLA and regional trunk services at all bandwidths; and
 - Ethernet – covering Ethernet services at all bandwidths outside the WECLA.
- 2.4 In addition, we separately controlled ECCs, accommodation services and Ethernet services at bandwidths of up to and including 1Gbit/s inside the WECLA.
- 2.5 The current leased line charge controls apply from 1 April 2013 to 31 March 2016. Table 2.1 below summarises the 2013 LLCC.

⁷ Ofcom, March 2013 BCMR Statement.

⁸ The consultation process is set out in more detail in Section 2 of Volume I.

⁹ In this statement we have defined the Central London Area and the London Periphery as separate geographic markets (see Volume I).

Table 2.1: Summary of charge controls imposed on BT in the 2013 LLCC

	Services within scope	Value of X	Sub-baskets & Sub-caps ¹⁰
TI basket	<u>Connection and rental charges for:</u> Wholesale low, medium and high bandwidth PPCs outside the WECLA Wholesale low bandwidth PPCs inside the WECLA Regional Trunk – all bandwidths – rental only RBS, NetStream 16 Longline and SiteConnect TI equipment and infrastructure TI ancillary services(excluding ECCs) Interconnection services	RPI+2.25% ¹¹	Point of Handover sub-basket (RPI-0%) RBS, NetStream 16 Longline and SiteConnect sub-basket (RPI+2.25%) Ancillary services, equipment and infrastructure sub-cap (RPI+2.25%) TI all services sub-cap (RPI+10%)
Ethernet basket	<u>Connection and rental charges for:</u> Ethernet services up to and including 1Gbit/s outside the WECLA Ethernet services above 1Gbit/s outside the WECLA Ethernet ancillary services (excluding ECCs) Interconnection services	RPI-11.5%	Interconnection services sub-basket (RPI-11.5%) EAD 1Gbit/s sub-basket (RPI-11.5%) Ethernet all services sub-cap (RPI-RPI)
ECCs¹²		GBCI-0% on each charge	
Accommodation services	Access Locate Administration Fee Cablelink	RPI-0% on each charge	
Ethernet services in the WECLA	Wholesale low bandwidth Ethernet services up to and including 1Gbit/s in the WECLA	RPI-RPI on each charge	
Retail Analogue basket	Rental charges	RPI+2.25%	Retail analogue sub-cap (RPI+10%)

¹⁰ A sub-basket control applied to the weighted average value of revenues of services within the basket. This is in contrast to a sub-cap which would apply to each charge.

¹¹ Retail price index.

¹² In a separate statement in 2014, we implemented a direction that allowed Openreach to exempt new provisions of EAD services from the first £2,800 of ECCs and to make up the resulting loss of its revenue with a balancing charge of £548, which would be part of the standard connection charge for all EAD services. See Ofcom, *Excess Construction Charges for Openreach Ethernet Access Direct, Directions affecting the operation of the Leased Lines Charge Control, Statement*, 16 May 2014, <http://stakeholders.ofcom.org.uk/binaries/consultations/excess-construction-charges/statement/excess-construction-charges-statement.pdf> (May 2014 ECC Direction).

The 2016 BCMR

2.6 As set out in Volume I, Section 2, in reaching our decisions on the leased lines charge controls set out in this statement, we have taken account of stakeholder responses to nine consultations:

- April 2014 BCMR CFI;¹³
- October 2014 BCMR Consultation;¹⁴
- November 2014 BCMR Passives Consultation;¹⁵
- May 2015 BCMR Consultation;¹⁶
- Retail Very Low Bandwidth Services Consultation;¹⁷
- June 2015 LLCC Consultation¹⁸;
- June 2015 Cost Attribution Review¹⁹;
- November 2015 LLCC Consultation²⁰; and
- November 2015 Cost Attribution Review.²¹

¹³ Ofcom, Business Connectivity Market Review, Timetable and initial call for inputs, 1 April 2014, <http://stakeholders.ofcom.org.uk/binaries/consultations/business-connectivity-market-review/summary/Business-Connectivity-Market-Review.pdf>

¹⁴ Ofcom, Business Connectivity Market Review, Consultation on Data Analysis, 8 October 2014, http://stakeholders.ofcom.org.uk/binaries/consultations/bcmr-data-analysis/summary/BCMR_Data_Consultation.pdf

¹⁵ Ofcom, Business Connectivity Market Review, Preliminary consultation on passive remedies, 5 November 2014, http://stakeholders.ofcom.org.uk/binaries/consultations/bcmr-passives/summary/BCMR_passives.pdf

¹⁶ Ofcom, Business Connectivity Market Review, Review of competition in the provision of leased lines, 15 May 2015, http://stakeholders.ofcom.org.uk/binaries/consultations/bcmr-2015/summary/BCMR_Sections.pdf

¹⁷ Ofcom, Business Connectivity Market Review, Very low bandwidth leased lines, 15 May 2015, http://stakeholders.ofcom.org.uk/binaries/consultations/very-low-bandwidth/summary/VLB_TI_retail_market.pdf

¹⁸ Ofcom, Business Connectivity Market Review, Leased lines charge controls and dark fibre pricing, 12 June 2015, <http://stakeholders.ofcom.org.uk/binaries/consultations/lcc-dark-fibre/summary/lcc-dark-fibre.pdf>

¹⁹ Ofcom, Review of BT's cost attribution methodologies, 12 June 2015, <http://stakeholders.ofcom.org.uk/binaries/consultations/cost-attribution-review/summary/review-bt-cost-attribution-method.pdf>

²⁰ Ofcom, Business Connectivity Market Review, Update on the proposed leased lines charge controls, 13 November 2015, http://stakeholders.ofcom.org.uk/binaries/consultations/bcmr-update-proposed-leased-lines-charge-controls/summary/BCMR_LLCC_Consultation.pdf

²¹ Ofcom, Review of BT's cost attribution methodologies, Second consultation, 13 November 2015, http://stakeholders.ofcom.org.uk/binaries/consultations/BT-cost-attribution-review-second-consultation/summary/BT_Cost_Attribution_Review_Second_Consultation.pdf

- 2.7 In addition, during the course of this review we have sent formal information requests to BT and a number of other CPs. These requests have covered a range of issues. Our power to issue formal information requests is derived from s135 of the Communications Act 2003 (the Act), which allows us to require anyone to provide us with information that is needed for the purpose of identifying markets and carrying our market analyses.²²

June and November LLCC Consultations

- 2.8 In this Volume we focus on the responses submitted in relation to the June and November LLCC Consultations. Where proposals differ between the two consultations, we include only the November LLCC Consultation proposals. A summary of the charge control proposals set out in these consultations is set out in Table 2.2 below.

CAR Consultations

- 2.9 In the June 2015 and November 2015 LLCC Consultations we proposed to make adjustments to reflect the provisional findings of the cost attribution review (CAR). This review was undertaken as an input into establishing the Regulatory Accounting Guidelines. As we explain in more detail in Annex 28, having undertaken the analysis in the CAR, we no longer consider that it would be useful to establish the Regulatory Accounting Guidelines. We have therefore decided that we will not conclude whether BT's cost attribution rules are appropriate. We explain in Annex 28 the next steps in the review for regulatory accounting purposes. However, the analysis carried out and the proposals included in the June 2015 and November 2015 CAR Consultations and stakeholders' submissions in response to these proposals have helped us identify errors and other potential base year adjustments for the leased lines charge control in this control period.

²² s135(3)(g).

Table 2.2: Summary of the proposed controls and starting charge adjustments as set out in the June and November 2015 LLCC Consultations

Overall cap (value of X)	Additional sub-caps and sub-baskets	BT product name to which sub-cap or sub-basket applies ²³	Starting charge adjustment	Starting charge adjustment - sub-caps and sub-baskets
Ethernet basket				
CPI-12.5% ²⁴	1Gbit/s Ethernet product variant which does not require collocation at a BT main fibre exchange (CPI-13.75%)	1Gbit/s EAD ²⁵	-10%	1Gbit/s EAD (-9%)
	EAD distance related charges (where applicable) ²⁶ (CPI-13.75%)	EAD Main link		Main link (-9%)
	Interconnect charges levied on CPs to connect to BT network (CPI-13.75%)	Bulk Transport Link (BTL)		Interconnect (-9%)
	Sub-cap on all charges (CPI-CPI)	All Ethernet Services		
TI basket				
CPI-3.5%	2Mbit/s services used by mobile operators for mobile site connectivity (CPI-12.25%)	2Mbit/s Radio Backhaul Services (RBS), NetStream 16 Longline and SiteConnect	-5%	2Mbit/s RBS, NetStream 16 Longline and SiteConnect (7.5%)
	Sub-cap on all charges (CPI-CPI)	All TI services		
Accommodation services i.e. to rent space in BT exchanges				
CPI-0% on each charge	None	Accommodation services	None	None
Excess construction charges (ECCs)				
GBCI-0% ²⁷ on Contractor ECCs	Basis of charges obligation	Construction activities that Openreach provides through an external contractor	None	None
CPI-21% for blown fibre		Fibre installation using blown fibre technique		
CPI+8.25% for cable		Installation of copper or fibre cables		
CPI+4.5% for blown fibre tubing in duct		Installation of blown fibre tubing in ducts		
CPI+7% for internal cabling		Internal cabling work		
CPI+5% for survey fee/planning charge		Survey fees and planning charges		

²³ See Annex 15 of the June 2015 LLCC Consultation for references to BT's product lists.

²⁴ Consumer Price Index (CPI).

²⁵ EAD stands for Ethernet Access Direct.

²⁶ An EAD charge has two components: a local access charge plus a distance related charge.

²⁷ General Building Costs Index (GBCI).

Ethernet Time Related Charges (TRCs)				
+0.2%	None	All Ethernet TRCs	Reduction to align charges with TRCs provided for wholesale local access	None

BT's pricing during the period between controls

2.10 Due to the delay in completing this Statement, the charge controls we are now setting will take effect from 1 May 2016, rather than from 1 April 2016. BT has advised that it is prepared to make voluntary commitments such that all parties affected by the charge control will be put in a similar position as they would have been had the charge controls been implemented on time.²⁸ We welcome such a commitment from BT and will look to finalise BT's commitment as soon as possible.

Document structure

2.11 The rest of this document is structured as follows:

- Section 3 outlines the form and duration of the charge control;
- Section 4 outlines the framework for our assessment that we take into account in designing our proposed charge controls;
- Section 5 outlines the charge controls for Ethernet services;
- Section 6 outlines the charge controls for TI services;
- Section 7 outlines the approach for balancing the use of glide-paths and SCAs;
- Section 8 outlines our controls for Accommodation, ECCs and TRCs; and
- Section 9 explains how some of the key charge control decisions are implemented in the SMP conditions.

2.12 In addition there are a number of Annexes which support our main conclusions in this Volume, including:

- Annex 26 – LLCC Model; where we describe our modelling approach and set out the values of X we have calculated;
- Annex 27 – Base year costs and adjustments; where we describe how we have determined our base year costs and adjustments;
- Annex 28 – CAR analysis; where we set out our decisions on changes to the way that BT attributes its costs to services;

²⁸ Email from BT (Mark Shurmer) to Ofcom (Jonathan Oxley), 3 March 2016.

- Annex 29 – Efficiency; where we set out the analysis we have used to derive our efficiency assumptions for Ethernet and TI services;
- Annex 30 - WACC; where we explain our approach to setting each of the WACC parameters.
- Annex 31 - Nera, Estimation of BT's Equity Beta; where Nera provide an update to its analysis of BTs equity and asset betas;
- Annex 32 - Other Forecasting Assumptions (Volumes, AVEs and CVEs, asset and input price changes); where we explain the rest of the assumptions we have made to forecast costs and revenues to input into the 2016 LLCC Model;
- Annex 33 – Impact of Dark Fibre on LLCC; where we describe our analysis on the impact that introducing regulated dark fibre access (DFA) on the charge control;
- Annex 34 – Discounts; where we set out our conclusions as to whether discounts should count towards BT's compliance with the charge control; and
- Annex 35 – Legal Instruments; where we set out the legal instruments.

Section 3

Form and duration of the charge control

Introduction

- 3.1 This section sets out our conclusions on the form of the leased lines charge controls and their durations for low bandwidth TI services in the UK excluding the Hull area, and wholesale Ethernet services at bandwidths up to and including 1Gbit/s in the LP and the RoUK excluding the CLA and Hull area.
- 3.2 In particular, we discuss:
- the reasoning behind our conclusion that the main controls should take the form of an Inflation-X price cap, including our choice of the CPI as the relevant inflation index; and
 - the reasons for concluding that the charge controls should last for a period of just under three years.
- 3.3 In addition to the low bandwidth TI and Ethernet charge controls, we have also decided to control the charges of certain ancillary services, namely Accommodation, ECCs and TRCs. The form of these controls differs, in some aspects, to what we propose in this section. We set out our conclusions for ancillary services in Volume II, Section 8.

We have decided to apply Inflation-X charge controls

June 2015 LLCC Consultation

- 3.4 In the June 2015 LLCC Consultation, we proposed to use Inflation-X charge controls for low bandwidth TI services in the UK excluding the Hull area, and wholesale Ethernet services at bandwidths up to and including 1Gbit/s in the LP and the RoUK excluding the CLA and Hull area.

Stakeholder comments

- 3.5 All five stakeholders who commented on our proposal (BT, [3], GTC, Virgin and Vodafone) agreed with the use of an Inflation-X charge control. Virgin Media commented that the Inflation-X form of charge control has shown that it continues to provide a basis for competitive entry of other providers of leased line services and has seen competition flourish in the market. Both Virgin Media and Vodafone noted that the Inflation-X form of charge control incentivises the firm to manage costs, find efficiencies and make investments.

Our conclusions

- 3.6 The Inflation-X form of control has been tried and tested over many years for telecoms charge controls and is the same form of control as we adopted for the current charge control. It has a number of desirable properties, including that it gives BT incentives to enhance its efficiency and make efficient investments. This is an important consideration for us, reflecting the requirements of section 88 of the Act.

- 3.7 Such a charge control entails forecasting the efficiency gains that BT might reasonably be expected to achieve over the control period, and determining the maximum permitted price change for particular groups of services taking these forecast efficiency gains into account. In order to maintain its allowed profitability on these services, BT would have to make efficiency improvements to reduce its costs in line with the expected path set by the charge controls.
- 3.8 In addition, the Inflation-X form of charge control provides an incentive to make efficiency gains over and above those forecast as part of the control. If BT is able to deliver the required services at a lower cost than has been forecast, it can keep the profits resulting from these savings. In this way, an Inflation-X type of control provides incentives to 'outperform' the charge controls and improve efficiency over time. Customers also benefit in the longer term, as these additional efficiency gains can be shared through lower prices when the charge controls are reset.
- 3.9 The Inflation-X approach can also provide incentives for efficient investment. The level of the charge control is usually set to allow the firm to earn a reasonable rate of return (the cost of capital) if it is efficient, and a consistent approach can be taken over charge control periods to encourage such investment.
- 3.10 Despite the fact that such a form is tried and tested and currently applies for charge controlled leased lines services, we considered whether alternatives to the Inflation-X form of charge control might be appropriate in the current circumstances. In particular, we considered whether rate of return controls (also known as 'cost-plus') or retail minus controls may be appropriate. We proposed to conclude that Inflation-X is more appropriate for the main controls in this case than the main alternative forms. The primary reasons were:
- Rate of return controls have weaker incentive properties than an inflation-x price cap; and
 - Retail-minus controls do not restrict wholesale charges directly and therefore may be less effective at controlling the risks of an SMP wholesale operator levying excessive charges.²⁹
- 3.11 We therefore conclude that the Inflation-X form of charge control is likely to best meet our statutory objectives for the main charge control baskets.
- 3.12 We have concluded that we do not consider it appropriate to adopt error correction mechanisms for these charge controls. As noted above, we are adopting a price cap form of control reflecting the superior incentive properties of price caps as opposed to alternative forms of control. The incentive properties of price caps arise from the ability of the regulated firm to benefit from out-performing the charge control assumptions through increased profitability as incurred costs fall below forecast costs. Under the main alternative form of charge control, rate of return controls, the

²⁹ Ofcom has used retail-minus controls in other circumstances e.g. in the case of Openreach's VULA product. In that case, Ofcom judged that competitive constraints would reduce the risk of excessive pricing for VULA services. Ofcom also noted uncertainty over future demand for NGA services and the time profile over which NGA investment should be recovered such that setting a control at that time risked setting inappropriate price levels that could harm incentives for efficient investment and pricing. Ofcom, June 2014 FAMR Statement, Para 1.45. Available at: <http://stakeholders.ofcom.org.uk/binaries/telecoms/ga/fixed-access-market-reviews-2014/statement-june-2014/volume1.pdf>

regulated firm's charges are closely tied to incurred costs over the period of the control. The use of error correction mechanisms within a price cap has the effect of moving closer to a rate of return control. In the extreme, a rate of return control could be characterised as a price cap with a complete set of adjustment mechanisms.

- 3.13 In considering the use of error correction mechanisms, we consider it important to distinguish between factors that are exogenous to the firm, and those that are endogenous. Where it is possible to identify factors that are largely exogenous to the firm, error correction mechanisms could be employed within a price cap without significantly impacting on the firm's incentives to appropriately manage those factors. Furthermore, it may lead to a more appropriate allocation of risks between the firm and its customers. Generalised inflation is typically considered to be exogenous to the firm and hence why inflation-X forms of price cap are widely adopted by regulators in the UK and beyond.
- 3.14 By contrast, where factors are to a significant extent endogenous to the firm, it is difficult to construct mechanisms that correct for forecast errors but do not undermine the incentive properties that arise from the ability to out-perform the forecast.
- 3.15 In our view, leased lines volumes are in large part endogenous to BT because they are driven by factors such as price and quality, which, under the current regulatory framework, are partly determined by BT. We therefore consider that error correction mechanisms in relation to volumes are unlikely to be appropriate.³⁰
- 3.16 Furthermore, one of the characteristics of leased line markets is that volumes can deviate year-on-year around a long-term trend. Therefore, it could be that volume forecasts over a three year period are reasonably accurate by the end but changes in years one and two of the control are different to what was expected; for example, one year of particularly strong growth is followed by a year of weaker growth. If we imposed a starting charge adjustment based on short-term deviations, this would have implications for the stability and predictability of the regulatory environment. We believe that the risks associated with this are likely to outweigh the potential benefits of adjusting prices based on volume changes, particularly as any variation in cost due to short-term deviations is unlikely to be biased in a particular direction.
- 3.17 It should also be noted that in later sections of this statement we also impose particular variants of the Inflation-X form of control that do not involve forecasting costs and setting prices according to these forecasts for individual services or groups of services.
- 3.18 We have proposed this type of control where we believe the particular circumstances of those services mean that a modelled CPI-X control, based on forecasts of BT's costs and efficiency signals is not appropriate, but where we consider that a control on prices is still required. For instance, we have proposed that the charge for the new DFA remedy is set by reference to BT's EAD 1 Gbit/s service, for reasons set out in Annex 33 on Dark Fibre. We have also imposed 'safeguard' caps of CPI-0% or CPI-CPI (no real increases in prices and no nominal increases in prices respectively)

³⁰ Vodafone made a number of representations in advance of the June 2015 LLCC Consultation about error correction mechanisms. We considered these arguments in the June 2015 LLCC Consultation and decided against error correction mechanisms beyond that for CPI. Vodafone has not provided additional substantive evidence since the June 2015 LLCC Consultation so we do not address this issue further in this statement.

where we believe that this is the most appropriate means to achieve our specific policy objectives.³¹

We have decided to use CPI as our benchmark for inflation

June 2015 LLCC Consultation

- 3.19 In the June 2015 LLCC Consultation, we proposed to use CPI as our benchmark for inflation.

Stakeholder comments

- 3.20 All six respondents who commented on our proposal (BT, [X], GTC, TalkTalk, Virgin and Vodafone) agreed with the use of CPI as the relevant benchmark for inflation. Vodafone considered that CPI is the most widely used measure of inflation and supported its use in the charge control. Virgin Media agreed that CPI was widely used and also considered that the index is well understood. Moreover, Virgin Media noted that although it had previously been in favour of retaining RPI-X, given that other market reviews have used CPI, there is merit in adopting a consistent approach.
- 3.21 BT agreed, on balance, with our proposal to use the CPI index, however, it noted a concern that the level of inflation used during cost forecasting and the relevant inflation benchmark should be consistent otherwise there could be a risk of forecasting error.

Our conclusions

- 3.22 Inflation features in the setting of charge controls in two ways:
- first, to determine how the limit on prices is updated each year (e.g. in the form of RPI-X or CPI-X); and
 - second, when setting a charge control based on forecast costs, the cost of inputs will typically be forecast to vary over time and the cost of different inputs will vary in different ways, e.g. pay related costs may vary differently from asset replacement costs.
- 3.23 In this section we are concerned with the former, i.e. how we should index the price caps for the regulated services in question. The question of how the price of different inputs should be forecast to vary over time is discussed in Volume II, Sections 5 and 6 of this document. In Annex 32 we respond to BT's point regarding consistency in relation to the inflation levels used in cost forecasting and the relevant inflation benchmark.
- 3.24 The reason for using an inflation index in the charge control formula is to protect the regulated firm and customers from exposure to exogenous circumstances over which they have no control. If inflation rises by more than forecast, the Inflation-X formula protects the firm from the cap becoming tighter than intended. Similarly, if inflation

³¹ See Sections 5 and 6 and, in particular, Section 8 (on our proposed control on Accommodation, ECCs and TRCs), where we apply these forms of control.

risers by less than forecast, then customers do not pay more than necessary to compensate the firm for general inflationary pressures.

- 3.25 In the March 2013 BCMR Statement we decided that RPI was the appropriate index to use. However as a result of an announcement by the Office for National Statistics (ONS) in January 2013 that the RPI “*does not meet international standards and recommended that a new index be published*” we decided to consider afresh the use of RPI in our charge controls as a part of the June 2014 FAMR Statement.³²
- 3.26 In the June 2014 FAMR Statement we considered RPI and CPI under a framework for identifying whether, in particular circumstances, a departure from the default inflation index might be appropriate.³³ We have used this framework again to assess the appropriateness of RPI and CPI for leased lines charge controls. In summary:
- official status: As we did for the June 2014 FAMR Statement and June 2014 WBA Statement³⁴ we consider that the ONS’s conclusion that the RPI does not meet international standards and the subsequent declassification of the RPI as a National Statistic are relevant factors for us to take into account, even if it is the case that forecasters adjust for known biases in the RPI;
 - cost causality: We consider an important part of the rationale behind indexing charge controls is to compensate for forecast error in how costs might evolve over time. To this end, the choice of index should take into account the extent to which the index reflects likely changes in the input costs of the regulated services. We have used both CPI and RPI estimates in our forecast of outturn operating costs and it is not clear whether the RPI or the CPI might better track total costs of providing leased lines services. We have estimated our operating cost inflation to be 3.0% per annum for pay and 3.2% and 2.1% per annum for non-pay for TI and Ethernet respectively. This lies above forecasts of both the CPI and the RPI, although it is closer to the RPI. However we have kept asset prices flat³⁵ in nominal terms (i.e. zero inflation). Capital costs (depreciation plus a return on mean capital employed) account for a sizable share of the total cost of the leased lines services we charge control.³⁶ Therefore, we believe that the net effect of our operating cost inflation and asset price assumptions will be to produce an overall cost inflation assumption closer to the CPI;
 - exogeneity: An important consideration is that the index cannot be influenced by the regulated firm or individual customers of that firm. Since the RPI and the CPI are both macroeconomic variables and are calculated by the ONS, each is exogenous to the actions of BT or its customers;
 - availability of independent forecasts: We typically use forecasts of inflation that are compiled by an independent body. Since the RPI and the CPI are widely used in the UK economy, they are regularly forecast by analysts; and

³² Ofcom, June 2014 FAMR Statement, Volume 2

³³ Paragraphs 3.110 to 3.164, Volume 2, June 2014 FAMR Statement

³⁴ Ofcom, June 2014 WBA Statement

³⁵ Except for duct and copper, which are valued through the RAV-based approach (RPI inflation)

³⁶ For example, section 5.1 of BT’s 2013/14, *Regulatory Financial Statements* (RFS), p. 23 <http://www.btplc.com/Thegroup/RegulatoryandPublicaffairs/Financialstatements/index.htm> shows that capital costs accounted for about 60% of TISBO (up to and including 8Mbit/s) and AISBO Non WECLA total costs in 2013/14

- regulatory predictability: Regulatory predictability is important for dynamic efficiency. However, as we did for the June 2014 FAMR Statement and June 2014 WBA Statement we note that regulatory predictability does not mean doing the same thing at every market review. Instead, it requires that regulatory decisions are clearly reasoned, consulted on, and that stakeholders are given sufficient notice of changes to regulation.
- 3.27 In our June 2015 LLCC Consultation we proposed to use CPI as our benchmark for inflation. Having compared the CPI and the RPI against our framework, we conclude that on balance, it is more appropriate to use the CPI to index the main leased lines charge controls. There are few differences in the way that the two indices perform against most of the factors considered above, but in relation to ‘official status’ in particular, we consider that the CPI is preferable. Therefore, we believe that CPI is the most appropriate inflation index to use for our main charge controls.

Duration of charge controls

June 2015 LLCC Consultation

- 3.28 In the June 2015 LLCC Consultation, we proposed charge controls that would run for three years from implementation.

Stakeholder comments

- 3.29 All five respondents (BT, [X], GTC, Virgin and Vodafone) agreed with our proposal for the charge control to be three years.
- 3.30 BT considered that it would be preferable for charge controls to be set for a period longer than three years as it would encourage stability and investment. However, it accepted, that a three year duration is consistent with the EU Common Regulatory Framework. Vodafone also noted that our proposal was consistent with the EU Common Regulatory Framework in their responses. BT also noted that in the event there is a delay to our charge control decision, we should re-consult if we propose any change to the duration of the control.
- 3.31 Vodafone considered that opportunities for over-recovery mean that a three year charge control is the maximum that should be permitted. If the charge control were longer it would risk prolonging over-recovery to the detriment of consumers. In addition, Vodafone remained of the view that a three year control should incorporate a volume error correction facility to avoid “meritless over-recovery”.³⁷

Our conclusions

- 3.32 The previous charge controls for business connectivity services were set with a three year duration, and we have decided that the duration of our charge control will be as close as possible to three years.

³⁷ Vodafone raised similar views with Ofcom prior to the publication of the June 2015 LLCC Consultation. These views are discussed in Annex 13 of the June 2015 LLCC Consultation and in the paragraphs above in this section.

- 3.33 Due to the delay in completing this statement, the charge controls we are now setting will take effect from 1 May 2016, rather than from 1 April 2016. Nevertheless, we have decided to keep the end date for the charge controls at 31 March 2019, resulting in a control duration of two years and 11 months.
- 3.34 We have considered the following factors when determining the duration of the charge control:
- the market review cycle specified in the Framework Directive;
 - the balance between dynamic and allocative efficiency;
 - alignment with financial years; and
 - forecasting issues.

Alignment with the forward-looking period of the market review

- 3.35 Our decision to set a control with a duration of two years and 11 months is aligned with the forward look period in this market review and the period over which we have made our assessment. We have decided to set SMP conditions based on our analysis of potential market developments over this period and believe that it is appropriate to align the charge control over the same period.

Balance between dynamic and allocative efficiency

- 3.36 As noted above, under section 88 of the Act, we must only impose a price control condition that appears to us to be appropriate for the purpose of (among other things) promoting efficiency. We have therefore considered what duration of control will best promote efficiency and, in particular, will strike the appropriate balance between dynamic and allocative efficiency.³⁸
- 3.37 The periodic re-setting of new controls allows the regulator to ensure that allocative efficiency objectives are met by setting the new control to bring charges into line with costs. Dynamic efficiency is enhanced by not doing so immediately. All other things being equal, a longer charge control period creates stronger incentives for dynamic efficiency compared to a shorter period because a longer period gives the firm more opportunity to enhance its profitability through innovation and cost reduction.
- 3.38 The longer the duration of the cap, the greater is the incentive to reduce costs, but the higher is the potential loss of allocative efficiency because prices can be out of line with costs for longer and perhaps by a greater amount. Shorter charge controls thus tend to give more weight to allocative efficiency, since prices have less scope to diverge from costs.
- 3.39 A shorter period would reduce the incentive on BT to innovate and make efficient investments and this could mean that dynamic efficiency was harmed. A longer control period allows those using BT's infrastructure to better plan their own investments in capital and business processes/systems. A period of regulatory stability and certainty is particularly important at a time when BT is investing in delivering new services and there is substantial technological change.

³⁸ We discuss the different types of economic efficiency in more detail in Section 4.

- 3.40 Given that we are imposing controls one month shorter than the three years we considered in the June 2015 LLCC Consultation, we consider that this duration continues to strike an appropriate balance in terms of the different efficiency considerations.

Alignment with financial years

- 3.41 We consider that it is advantageous to retain the end date for the charge controls at 31 March 2019, because this aligns with the financial year for BT. This enables any future charge controls to be set using the financial year used by BT, which is likely to improve the transparency and reduce complexity for any such future controls.

Forecasting issues

- 3.42 The forecasting of BT's costs over the period of the control involves many detailed calculations and assumptions, which we describe further in the sections below. Among the inputs to this calculation are the forecasts of the demand for circuits on BT's network(s). With some services having a degree of fixed costs, this means that, with all other things being equal, increased (decreased) circuit numbers will decrease (increase) BT's average, or unit, cost of providing these services. This movement in costs resulting from volume changes is an important issue in considering charge control duration and forecast uncertainty would be exacerbated over time, potentially leading to over- or under-recovery of costs.
- 3.43 We believe that a charge control period of just under three years strikes an appropriate balance between forecast uncertainty and providing regulatory stability for stakeholders.

Summary

- 3.44 We have decided to impose charge controls for leased line services with:
- the CPI-X form of control; and
 - a duration of two years and 11 months running from 1 May 2016 until 31 March 2019.

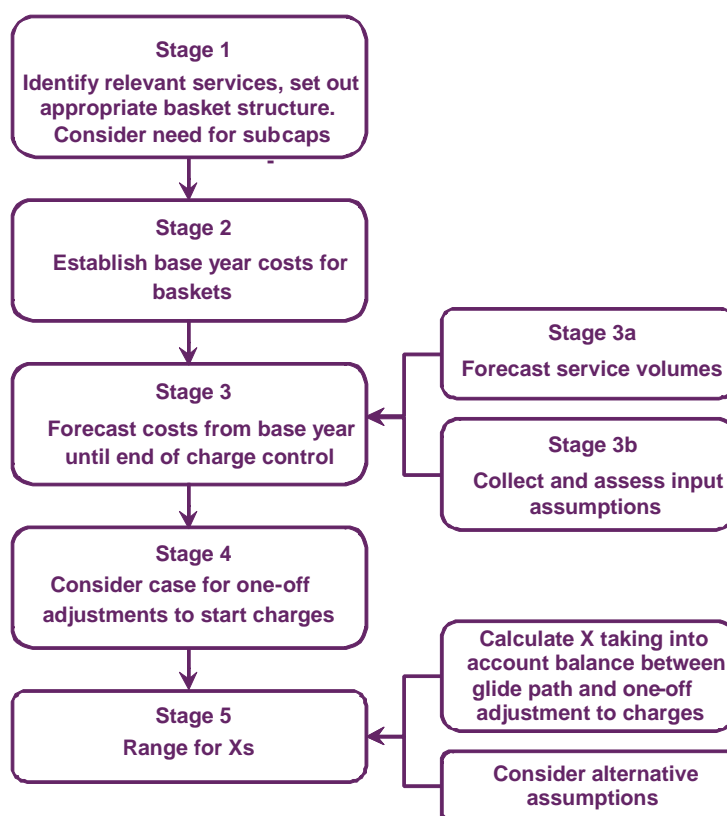
Section 4

Framework for assessment

Introduction

- 4.2 In this section, we describe the key economic principles that have guided our approach in designing our charge controls for low bandwidth TI services in the UK excluding the Hull area and wholesale Ethernet services at bandwidths up to and including 1Gbit/s in the LP and the RoUK excluding the CLA and Hull area. Our approach to designing our charge controls for Accommodation, ECCs and TRCs are generally based on the framework set out in this section, though they differ in certain aspects. We set out our decision for these ancillary services in Section 8.
- 4.3 There are five key stages in the methodology we have used to design the charge control:
- stage 1 - identify the relevant services and appropriate charge control baskets and sub-caps;
 - stage 2 - determine the base year costs for the services covered by the charge control;
 - stage 3 - forecast the costs of the services for the duration of the charge control;
 - stage 4 - consider the case for one-off adjustments to charges at the start of the charge control; and
 - stage 5 - calculate the value of X for the basket(s) of services.

Figure 4.1: Key stages in arriving at our charge controls



Source: Ofcom

4.4 We discuss below the principles which support each of the five stages listed above. We then go on to set out our decisions in relation to each of these stages in Sections 5, 6 and for certain aspects, 8.

4.5 Throughout this section, reference is often made to three types of economic efficiency. Given the importance of efficiency considerations in charge control design, we define these at the outset:

- **allocative efficiency:** this is achieved when prices of goods or services reflect the marginal costs of the resources used to produce them;³⁹
- **productive efficiency:** this is achieved when a firm produces its output at the lowest possible cost; and
- **dynamic efficiency:** improvements in dynamic efficiency occur over time as investment and innovation, for example arising from increased competition, result in the development of new goods and services, and technological advances that make the production of current and future goods and services less costly.

³⁹ In the presence of fixed costs, marginal cost pricing may not be viable. In the presence of fixed costs, recovering more fixed costs from consumers with inelastic demand can increase allocative efficiency.

Dynamic efficiency can be related to productive and allocative efficiency,⁴⁰ but it is often helpful to identify it as a separate type of efficiency.

Stage 1: Identify relevant services and appropriate charge control basket structure

- 4.6 A charge control can either be applied to an individual service or a ‘basket’ of services. Combining services in a single basket means that the CPI-X constraint would apply to the weighted average of the changes in the charges of the services in the basket. We describe below the principles to which we have had regard when we design the baskets for this charge control.

Principles for basket design

June 2015 LLCC Consultation

- 4.7 In the June 2015 LLCC Consultation, we identified a set of principles to use when we evaluate whether it would be appropriate to combine certain services together in a broad basket or keep them in separately controlled baskets in our proposed charge controls. We proposed to apply principles relating to the following:
- efficient charging structures;
 - competition;
 - migration incentives; and
 - consistency with other rules.

Stakeholders’ comments

- 4.8 Stakeholders who responded to the June 2015 LLCC Consultation did not raise any issues in relation to the principles to which we have had regard when we design the baskets this charge control.

Our conclusions

- 4.9 In reaching our conclusions for the design of the control baskets for our leased line charge control, we have been guided by the following principles:
- ensuring consistency with other relevant rules;
 - allowing relative prices to be set at efficient levels for efficient cost recovery;
 - safeguarding against the risk of adverse effects arising from price distortion, particularly excessive pricing or unduly discriminatory pricing; and
 - giving the flexibility to allow for efficient migration when appropriate.

⁴⁰ Productive and allocative efficiency are sometimes collectively referred to as ‘static efficiency’.

- 4.10 We explain below how and why we consider that these principles are relevant to determining the advantages and disadvantages of combining services into relatively broad baskets and discuss how any disadvantages could be addressed.

Consistency with other rules that apply to the services that we charge control

- 4.11 We consider that our basket design should take account of other rules that apply to the services that we charge control. Our charge controls should not conflict with such rules in a way that requires BT to breach a rule in order to adhere to the charge controls (e.g. BT's Undertakings).

Advantages of broad baskets

- 4.12 A broad basket gives BT some pricing freedom to determine the structure of prices which meet the charge control. Compared to a narrow basket, which imposes tighter controls on the charges of individual services, this pricing freedom may be more likely to result in charges which recover costs, particularly fixed and common costs, in an efficient way. This is important in the case of wholesale leased lines because their provision is characterised by fixed and common costs, as well as ongoing technology changes.
- 4.13 A broad basket also allows BT to respond during the control period to changes in demand and costs by changing relative prices. Narrow basket definitions mean that Ofcom determines the structure of relative prices at the start of a control period, and BT has little freedom to vary it thereafter. This may be inappropriate in markets that are rapidly changing, such as the business connectivity markets. Furthermore, we generally believe that BT is better placed than us to assess the patterns of demand and set relative prices for each service.
- 4.14 A broad basket may also be advantageous where it is desirable to allow BT to set prices to encourage efficient migration between an old service and/or technology and a new replacement alternative. Where the customer takes the decision to migrate, it can be optimal to set lower prices for services supplied using the lower cost (new) technology and higher prices for services supplied using the old technology. BT can be given the necessary flexibility to offer lower prices on the new service, in order to encourage efficient migration, by including both old and new services in a single charge control basket. Where narrower baskets are used the difference in relative prices is likely to only reflect static cost differences, which may not be sufficient to encourage efficient migration.
- 4.15 For these reasons, Ofcom has often chosen to combine services into broad baskets, unless there are reasons not to do so. This has been our position in the three previous leased line charge controls in 2013⁴¹, 2009⁴² and 2004⁴³, as well as in other charge controls such as WBA⁴⁴ and ISDN30.⁴⁵

⁴¹ Ofcom, March 2013 BCMR Statement, Paragraphs 19.13-19.56 and 20.15-20.52

⁴² Ofcom, July 2009 LLCC Statement, Paragraphs 4.14 and 5.16

⁴³ Ofcom, *Partial Private Circuits Charge Control: Final Statement*, 30 September 2004, Paragraphs 3.3-3.18

http://stakeholders.ofcom.org.uk/binaries/consultations/ppc_charge_control/statement/ppc_stmnt.pdf

⁴⁴ Ofcom, June 2014 WBA Statement, Paragraphs 7.91-7.93

⁴⁵ Ofcom, *Wholesale ISDN130 price control, Statement*, 12 April 2012, Paragraphs 4.6-4.1

<http://stakeholders.ofcom.org.uk/binaries/consultations/isdn30-price->

Disadvantages of broad baskets

- 4.16 The main disadvantage of a broad basket is that, in some circumstances, the flexibility to set relative charges can be exploited by the regulated firm to harm competition. Two sets of circumstances are particularly relevant.
- 4.17 First, BT may have an incentive to price in a manner that favours its downstream operations, or its 'internal' sales.⁴⁶ Where BT and competing operators use different wholesale services to provide the same downstream service, BT may have an incentive to reduce the price of the wholesale service it uses most and increase the price of the wholesale service used by its rivals or the price of 'external' sales.⁴⁷ Placing both wholesale services in a single charge control basket without further restrictions could give it the ability to behave in this way, and this could harm competition in downstream markets.
- 4.18 Second, there may be differences in the intensity of competition which BT faces in the provision of different services. If competitive conditions differ between services within a single basket, BT may have an incentive to concentrate price cuts on the more competitive services and offset these with price increases for less competitive services. This might lead to excessive charges for the latter and might also encourage anti-competitive pricing of the more competitive services.

Addressing the disadvantages

- 4.19 It is possible for both these concerns to be addressed by using more narrowly defined baskets. Baskets could be defined to include only services where there is broadly the same degree of competition, and there could be separate baskets for services which are used predominantly by BT on the one hand, and for services which are mainly used by its competitors on the other.
- 4.20 Sub-caps within a basket can also be used to address these disadvantages. It may often be preferable to define a broad basket and to prevent BT from setting charges which could harm competition by means of sub-caps. In this way, harm to competition can be prevented while, at the same time, retaining the benefits of pricing flexibility.
- 4.21 Whether a broad basket with sub-caps is preferable to a larger number of smaller baskets will depend on the circumstances of the case. In general, the benefits of broad baskets are greater, the greater the extent of common costs and the stronger the incentives on BT to set efficient charges. Separate baskets may be preferable where BT has a strong incentive to set charges in a way which disadvantages its rivals.

Market definition and basket design

- 4.22 Market definition is one of a number of factors to take into account when designing the basket structure. It is not always necessary to align basket composition and market definition as it will often be desirable to include services from two or more different markets within a single basket. This is because services in different markets

[control/statement/ISDN30_final_statement.pdf](#)

⁴⁶ 'Internal' sales refer to sales by an upstream division of BT (e.g. Openreach) to a downstream division of BT (e.g. BT Consumer or Global Services).

⁴⁷ 'External' sales refer to sales by a division of BT to another operator.

can share common costs and the intensity of competition in the relevant markets may be similar. In the past, Ofcom has included services from different markets in a single basket in a number of previous charge controls. For example, the TI basket in the 2013 LLCC included regional trunk and terminating segments of low, medium and high bandwidths.⁴⁸ However, if there is a marked difference in the intensity of competition between two services in separate markets, then it may be appropriate to put those services in separate baskets.

- 4.23 Services which are in the same market will typically have similar competitive conditions. If a charge control were justified, these could be placed in a single basket because an increase in the price of one may be constrained by switching to the other. This could, in theory, also mean that a cap on the price of one service only could be a sufficient constraint, and the other service could be outside the charge control basket entirely. Where there is evidence that substitution to a charge controlled service is sufficiently strong to constrain the price of another service, then the more deregulatory option is likely to be preferred.
- 4.24 There may however be some cases where competitive conditions are not completely homogenous within a single market. For example competition can be less strong for some customers, or in certain geographic areas, than others. As discussed above it may also be possible to distinguish between internal and external sales where the relevant market consists of upstream products. Concerns about discrimination between certain segments of a market can therefore arise and so there is still a role for additional restrictions on pricing flexibility even where a charge control applies to services in a single market only.

Implementing our principles for basket design

- 4.25 We have decided to apply the following set of principles when evaluating whether it would be appropriate to combine certain services together in a broad basket or keep them in separately controlled baskets in our charge controls:
- **consistency with other rules** – our design of baskets has taken into account other rules and ensured that it does not require BT to breach these rules;
 - **efficient charging structures** – where the services being considered share substantial common costs, a single basket is more conducive to efficient charging structures and cost recovery;
 - **competition** – where the services being considered face different competitive conditions or where BT does not use the same wholesale inputs as its rivals, placing them in the same charge control basket may give BT an incentive to set prices in a way that undermines competition. In this case, we consider introducing sub-caps or placing the services in separate baskets; and
 - **migration incentives** – where it is appropriate for BT to encourage migration from a legacy service to a more efficient service, placing the services in the same basket would allow BT the necessary pricing flexibility.
- 4.26 We set out how we have balanced these principles when deciding on the structure for the charge control baskets for TI and Ethernet services in Sections 5 and 6.

⁴⁸ Ofcom, March 2013 BCMR Statement, Section 19

Stage 2: Determine base year costs

- 4.27 In formulating our decisions to set the charge control, we need to be able to determine all costs relevant to providing charge controlled services. We first need to determine the relevant cost base from which we can establish base year unit costs. To do this, we must establish:
- whether to base the control on BT's costs of provision or those of another operator;
 - the choice of cost standard;
 - the technology upon which we base our cost forecasts; and
 - the data used for base year costs.
- 4.28 Once we have determined appropriate base year costs, we have a relevant reference point from which we can forecast BT's future costs based on anticipated efficiency gains, volume changes and the estimated impact of volume changes on BT's costs.

Basing our cost forecasts on BT's costs or those of another operator

June 2015 LLCC Consultation

- 4.29 In the June 2015 LLCC Consultation we identified two options for the basis of our cost forecasts: BT's costs or those of another operator.

Stakeholders' comments

- 4.30 CityFibre commented that *"the choice of cost base to be used in determining the charge control for active leased lines is an important issue, which is not given sufficient consideration in the BCMR & LLCC consultation."*
- 4.31 Other stakeholders who responded to the June 2015 LLCC Consultation did not raise any issues in relation to the proposed framework for determining the base for our cost forecasts.

Our conclusions

- 4.32 In their response to our June 2015 LLCC Consultation, CityFibre made a number of substantive points on the weight we give to various considerations in deciding whether to base our cost forecasts on BT's costs or those of another operator. We have addressed CityFibre's comments in Section 5.
- 4.33 In determining the costs relevant to providing charge controlled services, we have considered two options for a relevant cost base: basing our cost forecasts on BT's costs or those of another operator.
- 4.34 Promoting and safeguarding competition is an important aspect of our regulation in business connectivity markets. Effective competition can lead to improvements in economic efficiency, through dynamic efficiency, and benefits to citizens and consumers. However, not all competition leads to such improvements in economic efficiency. For example, where competition leads to inefficient duplication of

investment, it can reduce economic efficiency. We consider that it is appropriate to promote and safeguard competition on its merits.

- 4.35 However, we recognise that competition that may seem to be inefficient in the short term, can give rise to improvements in economic efficiency in the longer term. In such cases, there may be an argument to depart from setting charges solely on the basis of the regulated firm's charges. For example, it may be appropriate to make an adjustment to reflect economies of scale advantages that are enjoyed by the regulated firm.⁴⁹

The choice of cost standard

June 2015 LLCC Consultation

- 4.36 In the June 2015 LLCC Consultation we considered two main options for our choice of cost standard:

- Current Cost Accounting Fully Allocated Cost (CCA FAC); and
- Long Run Incremental Costs + equi-proportional mark-up (LRIC+EPMU).

Stakeholders' comments

- 4.37 Stakeholders who responded to the June 2015 LLCC Consultation did not raise any issues in relation to the proposed framework for determining the choice of cost standard.⁵⁰

Our conclusions

- 4.38 Historically, our typical approach to setting charge controls for BT has been to allow BT to recover the incremental costs of provision plus an appropriate mark-up to allow for the recovery of common costs.⁵¹
- 4.39 In the context of proposing an apportionment of common costs for this charge control, we continue to consider that there are two main options:
- CCA FAC - under this approach, all of the firm's costs are distributed among the services it provides. Under the CCA accounting convention, assets are valued and depreciated according to their current replacement cost,⁵² and
 - LRIC+EPMU - using this approach, we would allocate common costs across the different services in proportion to the LRIC of individual services.⁵³

⁴⁹ See Section 5 for our reasons to base the control on BT's costs of provision as opposed to those of another operator.

⁵⁰ See Section 6 for a more detailed discussion of stakeholder responses on the relative merits of CCA FAC and LRIC + EPMU.

⁵¹ Common costs are those which arise from the provision of a group of services, but which are not incremental to the provision of any individual service.

⁵² An alternative to CCA would be Historical Cost Accounting (HCA) convention, where assets are valued and depreciated according to their historical purchase cost.

⁵³ For example, if the LRIC of service X was £100/unit and the LRIC of service Y was £50/unit, then (assuming the same volumes of each service) we would have a 2:1 ratio. If BT had common costs of

- 4.40 When assessing the cost base for our charge control, we start with an assessment of forward-looking costs, and include sunk costs, by exception, where required for dynamic efficiency reasons. Both the CCA FAC and LRIC+EPMU options are based on forward-looking costs and provide appropriate incentives for entry and investment. Also, both approaches include an allocation of fixed common costs to allow for full cost recovery.
- 4.41 Some relevant costs, for example, duct costs, are not forward looking costs as they are sunk costs, but nevertheless form part of the CCA accounts. We generally include relevant sunk costs in our cost base, for reasons of dynamic efficiency. If BT was not able to recover its sunk costs, this would deter future investment. However, this does not necessarily mean that BT should be allowed to recover the full replacement value of its relevant sunk assets.⁵⁴

Costs associated with the technology used to deliver leased lines services

- 4.42 A key element in forecasting the costs used as a reference to set charges is to identify the technology used to deliver the services in question. We would normally expect the processes and assets used by firms to produce goods and services to be subject to change over time as firms seek improvements in productive efficiency. This is particularly the case in competitive markets. Many of these changes occur gradually over time and can be considered to be 'business as usual' changes. We typically capture such reductions in unit costs through the use of an efficiency improvement target within our charge control cost forecasts.⁵⁵ However, from time-to-time major changes in technology (sometimes referred to as 'paradigm shifts') arise that provide opportunities for the firm to achieve larger improvements in productive efficiency.

June 2015 LLCC Consultation

- 4.43 In the June 2015 LLCC Consultation, we considered two different approaches to choosing the relevant technology to model during periods of major technology change. These are the modern equivalent asset (MEA) and the anchor pricing approaches.

The Modern Equivalent Asset approach

- 4.44 Ofcom's preferred approach to setting charges is to base costs and asset values on what is believed to be the most efficient available technology that performs the same function as the current technology. This may or may not be the one actually in use. This is sometimes described as the MEA approach to pricing. Such an approach is consistent with how we would expect charges to be set in a competitive market.
- 4.45 In order to qualify as the MEA, a new, more efficient technology must be capable of at least delivering the same service, to the same level of quality and to the same customer base as the legacy technology.⁵⁶

£6m, an equi-proportional mark-up would allocate £4m to service X and £2m to service Y.

⁵⁴ We discuss our choice of cost standard for Ethernet in Section 5 and for TI in Section 6.

⁵⁵ In a CPI-X charge control, we usually allow for both 'frontier shift' (the improvement in efficiency which an already-efficient company would expect to make due to technical progress) and 'catch-up' (the removal of inefficiencies existing at the start of the control period).

⁵⁶ Clearly, the MEA is not static, so the relevant time frame needs to be taken into account when

- 4.46 Setting prices on the basis of MEA costs is consistent with the asset valuation under the CCA framework, which is used in our 2016 LLCC Model. Under the CCA framework assets are valued at their current replacement cost and this is reflected in changes in the underlying asset prices. This can result in either holding losses, associated with reductions in the asset prices, or holding gains, increases in asset prices. In some circumstances the replacement asset might not be identical to the asset in use – it may well have superior functionality and/or support additional services. In such cases, the CCA value of the existing asset should be adjusted downwards to reflect the cost of a functionally identical modern asset.

The use of ‘anchor pricing’ during technological change

- 4.47 There are circumstances however where we would not set charges on the basis of the costs of new technology. There can be significant practical challenges and regulatory risks associated with adopting a new MEA when there are major changes in technology. In response to such concerns, we often adopt another approach to charge control setting, which we refer to as ‘anchor pricing’. This approach provides a solution to the practical challenges by departing for a period of time from the path of prices we would expect to observe in a competitive market.
- 4.48 The key principle of the anchor pricing approach is that consumers of existing services are not made worse off by the adoption of new technology, but others could be made better off by the adoption of newer services. In other words, following technological change, prices should not rise above the level implied by the hypothetical continuation of the existing technology.
- 4.49 Under anchor pricing, costs are projected as if no major technological changes were expected for the period of the control. If we use the anchor pricing approach to set the control, our cost projections usually reflect an assumption that existing technology remains in use for the period of the control. Additionally, we assume that all customers are supplied using this technology.
- 4.50 Anchor pricing can be implemented in a number of ways, but the key feature is that charges do not immediately reflect the costs of a new technology but, for a time, may be based on the costs of an existing, proven technology. This approach is intended to give the regulated firm incentives to invest in new technology only when providing services over the new technology would lower its overall costs and/or would enable it to provide higher quality services for which consumers are willing to pay a premium. It also means that the risk associated with the new technology is borne by the regulated firm.

Stakeholders’ comments

- 4.51 Stakeholders who responded to the June 2015 LLCC Consultation did not raise any issues in relation to the proposed framework for determining our approach to technology modelling.

assessing different technologies.

Our conclusions

Our criteria for assessing the most appropriate approach

4.52 As we set out in the June 2015 LLCC Consultation, the economic factors that we consider relevant to our assessment of whether to use MEA or an anchor pricing approach for our charge controls are:

- degree of certainty over costs;
- investment incentives; and
- customer migration.

Degree of certainty over costs

4.53 The MEA approach relies on Ofcom being able to set prices correctly based on the most efficient modern technology. It is therefore important to have robust cost data for the relevant MEA technology. Some of the practical difficulties in setting prices on the basis of a technology that has not yet become established include that:

- it is not always clear what the most efficient new technology is;
- it is very difficult to set the prices on the basis of a new reported unit cost for a technology in the early stages of its adoption because, initially, costs are unlikely to be a good indicator of their long-term values; and
- to enable cost recovery with this approach, it requires the regulator to allow separately for any transitional costs, e.g. migration costs, and to choose the optimal path for transition.

4.54 These practical challenges could mean that if Ofcom were to set charges on the basis of a MEA approach, there is a risk of regulatory failure, which could lead to incorrect estimates of the forward-looking costs of providing services. Therefore, in those cases, we adopt the anchor pricing approach.

Investment incentives

4.55 It is important that the cost standard we adopt is consistent with efficient investment incentives. The anchor pricing approach will in general give efficient signals for investment; however, it may not ensure that the benefits of a new, lower-cost technology are shared with consumers. Although the MEA approach allows customers to share in the benefits of a new technology, we need to ensure that this is consistent with appropriate incentives for investment.

4.56 In a market with rapidly changing technology, the MEA for a given service may change frequently. There can be significant sunk costs involved in investing in a new technology as well as transition costs in moving from one technology to another. If these are not taken into account, then changes in the MEA may not allow efficient operators the opportunity to recover those costs, which has the potential to give rise to disincentives for future investments. Therefore, we may need to take into account

holding losses associated with the legacy technology and/or transition costs associated with the new technology.⁵⁷

Customer migration

- 4.57 Where the customer takes the decision to migrate, it can be efficient to set relatively higher prices for services supplied using the legacy technology. We would expect this to encourage migration away from the legacy technology, thereby allowing the operator to benefit from the economies of scale associated with running one, rather than two, technologies.
- 4.58 The anchor pricing approach can be consistent with providing efficient migration signals. By setting the price control on the basis of the more expensive legacy technology, the firm is readily able to differentiate the prices of the services provided using the legacy and new technologies to provide incentives for customers to migrate to the newer services. Adopting similar pricing structures can be achieved under an MEA approach, but it requires the services provided by the legacy and new technologies to be in the same charge control basket, and there to be sufficient flexibility in the charge control constraints, e.g. sub-caps.

Data used for base year costs

June 2015 LLCC Consultation

- 4.59 In the June 2015 LLCC Consultation we proposed the principle of using BT's most recently published CCA FAC information in the Regulatory Financial Statements (RFS) as a starting point for forecasting costs over the control period

Stakeholders' comments

- 4.60 Stakeholders who responded to the June 2015 LLCC Consultation did not raise any issues in relation to the use of BT's most recently published CCA FAC information.

Our conclusions

- 4.61 On the basis that we conclude it is appropriate to use BT's costs and a CCA FAC cost standard, under our top-down approach to forecasting costs over the control period (which we explain further in Section 5), we typically start with BT's most recently published CCA FAC information in the Regulatory Financial Statements (RFS) as a starting point.⁵⁸
- 4.62 The RFS is BT's view of its costs, and the appropriate allocation of those costs. Therefore charge control processes, of which the 2016 LLCC is no exception, typically involve reviewing in detail the financial information provided by BT to ensure

⁵⁷ This does not mean that the MEA approach should prevent losses that are caused by an operator's inefficiency. Nor should it lead to higher prices than would be charged under an anchor pricing approach.

⁵⁸ We have sometimes used older data where we considered that it was the most robust data available. For example, in the June 2014 FAMR Statement we used 2011/12 information as the base year from which to model forward looking costs rather than 2012/13 data which was the most recent available. This was because the 2012/13 RFS contained material cost allocation methodology changes when compared to the 2011/12 RFS which, our analysis demonstrated, would result in significant over-recovery of costs for BT.

it represents the best available information, given our statutory duties and obligations, upon which to base the charge control. Based on these reviews, from time to time we need to make adjustments to BT's financial data. We discuss the adjustments we have decided to make in this case in Sections 5 and 6 and Annex 27.

Common cost recovery

- 4.63 Our primary focus in setting charges is to determine what we consider to be an appropriate pattern of cost recovery, including common cost recovery. Using BT's CCA FAC data as the starting point for considering cost recovery does not guarantee that all of BT's common costs are recoverable, but it does mean that a share of common costs are taken into account when setting regulated charges. A share of the common costs will also be left for BT to recover in unregulated markets.
- 4.64 BT's Accounting Methodology Document (AMD)⁵⁹ describes how BT allocates costs to services in the RFS. Essentially, BT aims to allocate costs in relation to usage. For example, BT calculates its total costs for a cost category e.g. land and buildings and then spreads those costs among the services that use it. Land and buildings costs are spread between the different services housed at BT's exchanges, in accordance with the amount of floor space devoted to each service. Each year, the amount of fixed common costs allocated to a particular service in the RFS may vary depending on the relative usage of that particular cost item. For example, if there was a large growth in Local Loop Unbundling (LLU) lines, then BT's AMD may allocate fewer of the common costs of land and buildings to leased lines and more to LLU.
- 4.65 In our charge control modelling, we do not seek to forecast the outcome of the RFS.⁶⁰ Rather we seek to establish an appropriate pattern of common cost recovery, as set out above. As we explain further in Annex 26, our modelling approach assumes that the total amount of fixed and common costs recovered from modelled services in the base year remains the same throughout the control, save for depreciation and changes in efficiency and inflation. Although this approach is likely to be a simplification of reality, through a consistent treatment, we can ensure that common costs are taken into account in one or another of the controls, with no bias to under or over recovery of costs.

Adjustments made to the base year data

- 4.66 Our objective in deciding whether or not to adjust base year data in a charge control is to ensure that the information which we use is representative of the relevant level of costs for the respective baskets on a forward-looking basis for setting that specific charge control.
- 4.67 There are two elements which are relevant to this assessment which we carry out as part of the charge control processes:

⁵⁹ BT Group, *Accounting Methodology Document 2015*, 31 July 2015, <https://www.btplc.com/Thegroup/RegulatoryandPublicaffairs/Financialstatements/2015/AccountingMethodologyDocument201415.pdf>

⁶⁰ In order to forecast the RFS, we would need to forecast the changes in usage of all BT's services, many of which may belong to unregulated markets. This would be an extremely complex and demanding task, carrying a high risk of error.

- We review in detail BT's financial information and investigate any issues which arise from this review. We carry out this exercise to ensure that the base year data we use represents the best available information, given our statutory duties and obligations, upon which to base the specific charge control.
 - We consider whether the information is representative of the relevant level of costs for the respective baskets. This involves a consideration of what an appropriate cost recovery profile should be for the charge control we are setting; in doing so, we assess whether adjustments are needed to ensure that the regulated firm is able to recover an appropriate level of costs including consideration of an appropriate pattern of common cost recovery (i.e. preventing any over- or under-recovery).
- 4.68 We use our regulatory judgement when considering what adjustments should be made to the base year data to best meet these objectives.
- 4.69 In Annex 27 we set out the framework and considerations which we have concluded are relevant to making the base year adjustments. We also assess and make decisions about all base year adjustments apart from those which have been identified as a result of the work undertaken in the CAR. Where issues have been identified as a result of the work carried out in the CAR, the relevant analysis is contained within Annex 28, which is supplementary to Annex 27.

Stage 3: Forecast costs for the duration of the charge control

- 4.70 Having identified the relevant base year costs under stage 2, the next stage is to forecast, from this starting point, how costs are likely to change over the duration of the charge control.

June 2015 LLCC Consultation

- 4.71 In the June 2015 LLCC Consultation we proposed that the following factors are key determinants of cost movements in 2015 LLCC Model:
- volume changes;
 - the impact of those volume changes on capital and operating expenditure, as reflected by the Asset Volume Elasticities (AVEs) and Cost Volume Elasticities (CVEs);
 - input price changes;
 - anticipated improvements in BT's efficiency;
 - the cost of capital; and
 - the impact of imposing other remedies.

Stakeholders' comments

- 4.72 Stakeholders who responded to the June 2015 LLCC Consultation did not raise any issues in relation to our framework for determining how costs are likely to change over the duration of the charge control.

Our conclusions

Volume changes

- 4.73 In order to understand how costs are likely to change over the charge control period, we forecast the volume of leased lines services that BT is expected to supply. Changes in the volume of BT wholesale leased lines services will be affected by overall market growth, as well as BT's expected share of the leased lines markets. For the 2016 LLCC a particular consideration is how volumes might change as a result of the introduction of the proposed dark fibre remedy. To make our volume forecasts, we have reviewed forecasts based on information provided from BT, other CPs and independent analysts.⁶¹

Relationship between costs and volumes

- 4.74 Having forecast the changes in volumes, we then model how the costs of the components that make up leased lines services will vary in response to volume changes for particular services. To do this, we use estimates of the AVEs and CVEs.⁶²
- CVEs, defined as the percentage increase in operating costs for a 1% increase in volume, are used to determine the level of operating costs in response to changes in volume; and
 - AVEs, defined as the percentage increase in assets required for a 1% increase in volume, are used to determine the level of capital costs in response to changes in demand for leased lines services.

Input prices

- 4.75 The price that BT has to pay for its various inputs, e.g. labour or assets, will clearly impact on its costs. For example, changes in asset prices impact on BT's asset base valuation and give rise to holding gains or losses which are reflected in costs in the year in which they arise. In order to assess these costs, we forecast the changes in the price of inputs over the duration of the charge control.⁶³

Efficiency estimates

- 4.76 We forecast the expected efficiency improvements that BT might reasonably be expected to achieve over the duration of the charge control. These efficiency improvements relate to expected changes in real unit costs that do not depend on changes in volumes, but reflect the general improvements in efficiency.⁶⁴

⁶¹ This is discussed in more detail in Sections 5 and 6 and Annex 32.

⁶² This is discussed in detail in Section 5 and 6 and Annex 32

⁶³ This is discussed in detail in Sections 5 and 6 and Annex 32

⁶⁴ This is discussed in Sections 5 and 6 and Annex 29.

Cost of capital

- 4.77 Under a charge control, we set the value of X such that BT's rate of return projected for the last year of the charge control is expected to be equal to its WACC.⁶⁵

Impacts of introducing the proposed dark fibre remedy

- 4.78 The availability of a dark fibre⁶⁶ remedy is likely to have an impact on BT's costs for active leased lines over the duration of the proposed charge control. For example, cannibalisation of active circuits by dark fibre may affect BT's cost recovery, and the remedy is likely to have associated development and implementation costs which BT will need to recover.
- 4.79 For the purposes of the charge control, we need to consider how dark fibre may affect BT's costs, and how this should be reflected in the active leased lines charge control, if appropriate. We set out our approach and implementation of this in Section 5 and Annex 33.

Stage 4: Consider whether to make starting charge adjustments

Principles for using glide-paths and Starting Charge Adjustments (SCAs)

- 4.80 Having forecast costs for the duration of the charge control, we then consider whether to make any one-off adjustments to bring prices closer to costs at the beginning of the control period.

June 2015 LLCC Consultation and November 2015 LLCC Consultation

- 4.81 In the June 2015 LLCC Consultation we set out our proposed approach to balancing the use of glide-paths and Starting Charge Adjustments (SCAs) to close the forecast gaps between BT's charges for controlled services and the costs of providing those services. Our proposals were structured around four principal considerations:
- our general preference for glide-paths;
 - when we would consider making SCAs;
 - balancing the use of SCAs and glide-paths in cases where there appear to be particular risks of distorted pricing signals; and
 - balancing the use of SCAs and glide-paths in cases where charges are significantly above costs.
- 4.82 In our November 2015 LLCC Consultation we consulted on a revised approach to assessing the appropriate balance between SCAs and glide-paths where charges are significantly above costs. Our views in relation to the first three of the above considerations remained unchanged in that consultation. However, we proposed

⁶⁵ This is discussed in detail in Sections 5 and 6 and Annex 30

⁶⁶ To find out more about the cost uplifts and volumes assumptions we have applied to dark fibre please refer to Annex 33

placing greater emphasis on a broader range of considerations that we considered to be relevant to exercising our regulatory judgement over the appropriate balance.

Stakeholders' comments

- 4.83 BT reiterated its general objections against SCAs. It claimed that the use of SCAs undermines the incentive properties of the CPI-X type of control, introduces regulatory uncertainty, discourages investment and undermines efficient migration signals.
- 4.84 BT believed that Ofcom's revised approach⁶⁷ is lacking in transparency and does not set out clear criteria for when a SCA should be made; BT found it difficult to discern any concrete criteria for assessing when and how this revised approach to SCA would apply in any charge control. BT suggested that it may be a matter of regulatory judgment as to the weight that Ofcom should place upon the respective economic issues in formulating the criteria it will use for applying such SCA, but Ofcom is still required clearly to set out the precise test criteria it will apply in deciding whether to make such adjustments.
- 4.85 TalkTalk believed that Ofcom's analysis would be more robust ([><]) if it is informed by some more quantitative analysis. It proposed an approach based on decomposing the amount of BT's returns in excess of its WACC into various factors causing the excess, and with respect to each of those factors, evaluating the suitability of applying SCAs. TalkTalk suggested that Ofcom should have access to data necessary to put some approximate numbers on each of the factors causing excess returns.

Our conclusions

- 4.86 We consider a judgment based approach that incorporates a broader set of criteria more appropriate than a formulaic approach. In reaching our decision on whether to have an SCA, or the level of the SCA, we have to balance a number of regulatory objectives, which do not readily lend themselves to a precise formula, whether one involving a strictly defined set of test criteria that would provide a binary answer as to whether to apply a SCA (as BT seems to prefer), or one that is based on decomposing BT's excess returns into a defined set of factors that cause them (as TalkTalk seems to propose). We also note that it is not always possible or reasonably practicable to clearly distinguish between the various factors causing BT's excess returns, which makes any analysis based on such a distinction less robust and at risk of error. Nevertheless, in deriving our regulatory judgment, we have estimated the impact of some key factors underlying BT's profitability, such as volume and efficiency outperformance or BT's cost re-attributions between charge controlled markets, and set these out in Section 7.
- 4.87 In the sub-sections below, we set out in detail the conceptual framework we use for considering glide paths and starting charge adjustments.

⁶⁷Ofcom, November 2015 LLCC Consultation

Our general preference is for glide paths

- 4.88 Within the price cap (i.e. CPI-X) approach to controlling charges there are three broad options for closing any gap between forecast revenues and costs over the charge control period:
- **glide path only approach:** charges follow a glide path (determined by the X in the CPI-X control) such that there is a gradual convergence of charges from the level at the start of the charge control period to the forecast efficient level of costs at the end of the control period;
 - **one-off starting charge adjustments:** charges are adjusted to cost at the beginning of the control period. Under this approach the required annual change in prices in subsequent years of the control, i.e. resulting from the X used in the price cap, will usually be smaller than under the glide path approach; and
 - **combination of one-off adjustments and a glide path:** charges are adjusted at the start of the control period to bring them closer in line with cost, but some of the gap between charges and costs is achieved through price changes, i.e. determined by the X, in subsequent years of the charge control.
- 4.89 In all three cases, the firm's expected rate of return should equal its cost of capital at the end of the charge control, but the degree to which we use glide paths will affect the time it takes for cost reductions (or increases) to feed into price reductions (or increases).
- 4.90 Where we have set charge controls to replace existing controls, e.g. in wholesale line rental (WLR)/LLU and the LLCC, we have typically had a preference to close any gap between charges and costs using glide paths, or a combination of some limited one-off adjustments with glide paths, rather than relying heavily or exclusively on one-off adjustments.⁶⁸ This is for two main reasons:
- to promote **productive efficiency** – a glide path allows the firm to retain the benefits of unit cost reductions beyond those forecast when setting the control for longer than one-off adjustments. As a consequence, the use of a glide path gives BT better incentives to pursue improvements in productive efficiency and/or grow volumes⁶⁹ than one-off starting charge adjustments.⁷⁰ These better incentives can be of particular importance where improvements could be made nearer the end of the control period. In such cases, the use of glide paths reduces the firm's incentives to delay efficiency improvements or pursue additional volumes until the beginning of the next control period because, even if improvements are made at the end of the previous control period, the firm retains (at least some of) the profit benefit associated with the improvement through the following control period; and
 - to promote **dynamic efficiency** – a glide path avoids discontinuities in charges over time and leads to a more stable and predictable background against which

⁶⁸Ofcom, June 2014 FAMR Statement, Volume 2, Paragraph 6.35

<http://stakeholders.ofcom.org.uk/telecoms/ga-scheme/specific-conditions-entitlement/market-power/fixed-access-market-reviews-2014/statement/>

⁶⁹ In the presence of fixed costs the firm can reduce unit costs by pursuing volume growth.

⁷⁰ Conversely, if costs are increasing then a glide path results in slower price increases and so it provides BT with incentives to control costs.

investment and other decisions may be taken. For example, if CPs enter into a three year contract then adjusting charges via a glide path allows CPs time to re-structure their contracts with end-users as the wholesale charges change more gradually. The use of glide paths can therefore support improvements in dynamic efficiency.⁷¹

- 4.91 Although the use of glide paths can provide stronger incentives for productive and dynamic efficiency improvements than one-off starting charge adjustments,⁷² it does so by allowing prices to diverge from costs for longer. The use of glide paths can therefore involve a reduction in short term allocative efficiency. For any particular charge control the appropriate balance between one-off starting charge adjustments or glide paths involves a regulatory judgement about the appropriate trade-off between these economic efficiency considerations.⁷³
- 4.92 Historically, we have typically attached higher weight to productive and dynamic efficiency considerations for wholesale leased lines, rather than trying to achieve allocative efficiency at every point in time. This is because productive and dynamic efficiency improvements are likely to generate greater benefit to consumers over time; as the firm becomes more efficient and increases investment and innovation, this should ultimately result in lower prices and better services for consumers. Consistent with this judgement, Ofcom has historically had a preference in favour of glide paths over one-off starting charge adjustments in its leased line charge controls.

When we would make starting charge adjustments

- 4.93 Despite our general preference for glide paths there can be circumstances in which the balance of efficiency considerations implies that some one-off starting charge adjustments are appropriate. For example, in the July 2009 LLCC Statement we found that it was appropriate to make some one-off adjustments to Ethernet charges.⁷⁴
- 4.94 For the purpose of this control, we have decided that there are broadly two types of circumstances in which the balance of efficiency considerations could imply that one-off starting charge adjustments may be appropriate:

⁷¹ A further characteristic of glide paths identified in the March 2013 BCMR Statement is that their use can more closely mimic the workings of a competitive market than one-off reductions, where excess profits are gradually eroded as rivals improve their own efficiency, see paragraph 18.101, March 2013 BCMR Statement.

⁷² Although in cases where the assets and production processes used by the firm to provide the regulated services are also important inputs to services provided by the firm in markets that are effectively competitive, the firm may have incentives to pursue improvements in productive efficiency absent the use of a glide path. In the case of wholesale leased line terminating segments, many of the underlying assets are not used to provide other competitive services, and so BT would have relatively poor incentives to operate efficiently if the regulatory framework required it to closely align charges with cost at all times.

⁷³ Although other considerations may also be relevant for specific cases; for example, incentives for the regulated firm to comply with other regulatory remedies.

⁷⁴ Ofcom, *Leased Lines Charge Control: A new charge control framework for wholesale traditional interface and alternative interface products and services*, 2 July 2009, Paragraphs 4.177-4.195 and 5.85-5.96 <http://stakeholders.ofcom.org.uk/binaries/consultations/lcc/statement/lccstatement.pdf>

- where the risks to economic efficiency or competition from distorted pricing signals are particularly significant, and therefore outweigh the benefits of a glide path approach; and
 - where prices are significantly above or below cost for reasons other than efficiency or volume growth.
- 4.95 However, even in those circumstances, if we considered that a starting charge adjustment would undermine the stability and predictability of the regulatory regime, including implications for future investment, we may still not consider it appropriate to make one.
- 4.96 In the sub-sections below, we set out the conceptual framework that we have decided to apply for the Ethernet and TI baskets in relation to starting charge adjustments.

Balancing the use of SCAs and glide-paths in cases where there appear to be particular risks of distorted pricing signals

- 4.97 As discussed above, there are arguments for bringing charges into line with cost sooner than would be implied by a pure glide path approach where charges are particularly high or low relative to cost. In such circumstances the signals for economic decision-making that are given by charges may be distorted. Such distortions may give rise to risks to economic efficiency that could outweigh the efficiency benefits of glide paths, for instance:
- significantly distorting customers' consumption decisions to the detriment of allocative efficiency; and/or
 - significantly distorting investment decisions to the detriment of dynamic efficiency.
- 4.98 We would normally expect the charges observed in a competitive market to be consistent with maximising economic efficiency. Therefore, if a charge could be considered to be consistent with that which would be levied in a competitive market, we would not expect it to give rise to distorted economic signals. In determining whether a charge appears to give rise to particular risks of economic distortion, we have historically considered whether it appears to be consistent with that which we would expect in a competitive market. To do so we consider it appropriate to compare BT's charges against DLRIC⁷⁵ and DSAC.⁷⁶
- 4.99 The economic rationale for using DLRIC and DSAC stems from the theory of contestable markets. In a contestable market, we would expect a charge to be within the range of LRIC⁷⁷ and SAC,⁷⁸ and to pass all relevant combinatorial tests.⁷⁹

⁷⁵ The Distributed Long Run Incremental Cost (DLRIC) is a cost measure related to the LRIC of a component. Within BT's network, groups of components are combined together to form a 'broad increment' (e.g. the 'Access' network or the 'Core' network). The DLRIC of a component is equal to the LRIC of a cost component plus a share of the costs that are common within the broad increment.

⁷⁶ The Distributed Stand Alone Cost (DSAC) for a component is equal to its LRIC plus an allocation of the SAC of the broad increment.

⁷⁷ The Long Run Incremental Cost (LRIC) is the incremental cost of a service over the long run (i.e. the period over which all costs can, if necessary, be varied).

Charges set equal to BT's CCA FAC, which is an accounting measure of costs rather than an economic measure, may satisfy such tests, but they are unlikely to be the only set of charges that would do so. Charges for services provided in a competitive market may, and indeed are likely to, depart from CCA FAC.

- 4.100 As we noted in the March 2013 BCMR Statement, undertaking combinatorial tests robustly is both complicated and impractical given the data that is available.⁸⁰ DLRIC and DSAC, which are generated by BT's LRIC model, are used by Ofcom as a practical alternative to using combinatorial tests based on LRIC and SAC.⁸¹
- 4.101 Although DLRIC and DSAC are conceptually relevant benchmarks for considering the appropriateness of BT's charges, the reliability of the estimates generated by BT's LRIC model has been questioned by Ofcom, as explained in the December 2012 Ethernet Disputes Determinations⁸² and as noted by Vodafone in its response to our Call for Inputs. Vodafone argued Ofcom should correct for the errors identified in BT's DSAC estimates.⁸³
- 4.102 As we have explained in the June 2015 LLCC Consultation,⁸⁴ we do not consider it proportionate to make fundamental changes to BT's LRIC model, given the limited role of DSAC in this charge control.⁸⁵ However, we acknowledge Vodafone's concerns and have taken into account the reliability of BT's DSAC information in considering the appropriate weight to place on this when considering the need for starting charge adjustments.
- 4.103 An alternative to using DLRIC and DSAC is to compare charges to a cost benchmark based on a specific mark-up on FAC. The advantage of this approach is that it does not rely on the outputs of BT's LRIC model, and therefore avoids the reliability concerns in relation to BT's DSAC and DLRIC information. The disadvantage is that, while perhaps more reliable, FAC information is less economically relevant in assessing whether charges are 'too high' or 'too low' than DLRIC and DSAC information. As discussed in Section 5, we consider that a control that brings all charges to FAC is unlikely to represent the most efficient pattern of cost recovery.

⁷⁸ The Stand Alone Cost (SAC) is the cost of providing a service on its own (i.e. on a stand-alone basis).

⁷⁹ A combinatorial test assesses whether the revenue from a combination of services recovers the common costs between the services as well as the incremental cost of each service.

⁸⁰ Ofcom, March 2013 BCMR Statement, Paragraph 18.113

⁸¹ DLRIC and DSAC have historically been used by Ofcom both in the context of considering whether to make starting charge adjustments and for considering compliance with cost orientation obligations.

⁸² Ofcom, *Disputes between each of Sky, TalkTalk, Virgin Media, Cable & Wireless and Verizon and BT regarding BT's charges for Ethernet services, Determinations and Explanatory Statement*, 20 December 2012, Paragraphs 12.110-12.246

http://stakeholders.ofcom.org.uk/binaries/consultations/ethernet-services/annexes/Ethernet_FD.pdf

⁸³ Vodafone, *Response to the April 2014 BCMR CFI*, 10 June 2014, Pages 28-29

<http://stakeholders.ofcom.org.uk/binaries/consultations/business-connectivity-market-review/responses/Vodafone.pdf>

⁸⁴ Ofcom, June 2015 BCMR Consultation, Paragraph 4.88

⁸⁵ The concerns we set out in the December 2012 Ethernet Disputes Determinations primarily related to the definitions of the broad increments used to calculate DLRIC and DSAC. These definitions are a fundamental building block of the LRIC model so are not a trivial issue to resolve. However, we note that they do not, as far as we are aware, affect the component LRIC and FAC estimates used to estimate AVEs and CVEs for this control.

- 4.104 Therefore, reflecting these considerations, in assessing whether BT's TI and Ethernet charges are sufficiently out of line with costs to suggest starting charge adjustments are appropriate, we have decided that it is appropriate to only compare BT's charges against our forecasts of DSAC and DLRIC in 2016/17 (the first year of the next charge control period). We consider that DSAC and DLRIC are more economically relevant in assessing whether a SCA should be made in this context, given that FAC is an accounting measure of costs rather than an economic measure.
- 4.105 Where charges appear to be excessively high or low based on our tests, we have decided to apply a starting charge adjustment unless the following applies:
- service revenues and volumes are not material and/or expected to cease over the charge control period; and/or
 - TI services that are priced below DLRIC, as we do not expect entry into a declining market meaning that our concerns around predatory or anti-competitive pricing are unlikely to be significant.
- 4.106 We set out in detail how we have carried out this analysis in Section 7.

Balancing the use of SCAs and glide-paths in cases where charges are significantly above costs

- 4.107 The prices for charge controlled services can exceed costs due to volume or efficiency outperformance by the regulated firm. As set out above, the use of price caps to control charges gives rise to incentives for such outperformance. The benefits to customers in the longer term from the lower prices that such outperformance can give rise to are part of the reason why price cap controls are typically favoured over other forms of charge control. The use of glide-paths to close outperformance related gaps between charges and costs reinforces BT's incentives to pursue efficiency and volume outperformance.
- 4.108 Consistent with our general preference for the use of glide-paths, we therefore have decided to continue to adopt a glide-path approach to closing any gap between charges and costs that has arisen as a result of volume and efficiency outperformance.
- 4.109 However, charges can significantly depart from costs due to reasons other than cost and volume outperformance. In such cases, the use of some form of starting charge adjustment⁸⁶ would not be expected to undermine the incentive properties of the control. Determining the appropriate balance between SCAs and glide-paths in such cases requires us to come to a regulatory judgement.
- 4.110 When exercising our regulatory judgement we must have regard to our statutory duties and European Community requirements as set out in the Communications Act.⁸⁷ Ofcom's principal duty is to further the interests of citizens in relation to communications matters, and to further the interests of consumers in relevant markets, where appropriate, by promoting competition. In doing so we must have regard to choice, price, quality of service and value for money.

⁸⁶ In respect of the gap which is not related to volume and efficiency outperformance.

⁸⁷ Section 3 and 4 of the Communications Act.

- 4.111 Protecting citizens and consumers from a firm with SMP levying excessively high charges is a central focus for Ofcom in using charge controls. Thus, in circumstances where charges exceed cost, the use of a glide path to close that gap over the control period would need to be weighed against requiring customers of the regulated services to pay charges that are higher than is required to compensate the firm for the costs incurred in providing those services over the control period. However, there can be productive and dynamic efficiency benefits associated with not seeking to closely align charges to costs at all times. We would expect these productive and dynamic efficiency improvements to give rise to future benefits to customers. Our duties therefore imply that there are a number of relevant considerations to the application of our regulatory judgement in this case. These relevant considerations are set out below.

Benefits to customers and end-users from bringing charges quickly into alignment with costs

- 4.112 The use of a pure glide-path approach in circumstances where charges significantly exceed costs results undesirably in customers paying significantly more for the charge controlled services over the control than is required to cover the controlled firm's efficient costs of providing the services.

Ensuring the regulated firm has an opportunity to recover its efficiently incurred costs

- 4.113 We seek to ensure that the regulated firm has an opportunity to recover its efficiently incurred costs through the use of the 'fair bet' concept. This approach is an important consideration for Ofcom because it supports dynamic efficiency improvements by creating a regulatory environment that is conducive to investment by the regulated firm. It is based on setting the regulated charges at the level of the firm's expected costs in the final year of each control. Although actual costs may (and typically will) turn out to be different, that difference is not expected to be biased in any particular direction.
- 4.114 In our charge controls, we base our forecasts on the cost allocations in BT's RFS. Many of BT's assets are shared between different services, and so costs for shared assets are allocated to different services, some of which may also be subject to separate charge controls. These cost allocations can change over time, depending on differences in the relative growth of different services and changes in BT's allocation methodology.
- 4.115 If charge controls are set simultaneously, then BT should have the opportunity to recover its costs in aggregate, even if allocations change over time. However, in circumstances where controls are not set simultaneously, changes in the cost allocations for one regulated market that are related to an opposite direction change in another regulated market, may lead to either a shortfall or excess cost recovery between the two markets combined, as a reduction (increase) in allocation to one market, which results in lower (higher) charges for that market, would not be reflected in higher (lower) charges for another regulated market, if its charge control was set based on a different cost allocation. Such misalignment may, under some circumstances pose a particular risk to the firm's opportunity to recover its efficiently incurred costs. This may be considered inconsistent with maintaining a fair bet to investors. Conversely, in other circumstances, changes in cost allocations may risk leading to over-recovery by the regulated firm.

Supporting investment in competing infrastructure by other CPs

- 4.116 The use of glide-paths can give market competitors longer to adapt to the changes in charges and better plan their future investments accordingly. Therefore, greater emphasis on the use of glide-paths may be more consistent with supporting investment.

Avoiding discontinuities in charges over time

- 4.117 The use of glide-paths can help to avoid discontinuities in charges over time, which in turn may lead to a more stable and predictable background against which investment and other decisions may be taken by both the regulated firm and its competitors. The use of glide-paths can therefore support improvements in dynamic efficiency.
- 4.118 However, where charges significantly exceed costs the use of a glide-path approach will itself involve large annual price changes so the benefits associated with smoothing price reductions over time may not be as significant as it would be where charges are more closely aligned with cost.
- 4.119 In the case of products experiencing a significant decline,⁸⁸ an initial gap between charges and costs might close to some degree over the control period absent any SCA or glide path, due to the loss of some economies of scale leading to increases in unit costs. An aggressive SCA might then lead to price increases later in the control period. Such a profile of prices over time is unlikely to be consistent with an environment in which investment and other decisions can be well planned, especially where prices have tended to be more stable over the previous years.

Promoting efficient migration signals

- 4.120 During periods of rapid change (for example in relation to technological change) there may be benefits to society associated with promoting an efficient migration from legacy technologies and services to newer alternatives. Charges can be used as a signal to support efficient migration in some cases. Therefore, the balance between the use of SCAs and a glide-path can be used to support efficient migration.

Conclusion

- 4.121 We have adopted the above conceptual framework to determine whether to apply SCAs for the Ethernet and TI baskets. Our application of these principles in relation to the Ethernet and TI baskets is discussed in Section 7 below.

Stage 5: Calculate the value of X for the basket(s) of services

- 4.122 Having forecast costs for each basket, we then model the value of X required to bring BT's prices at the start of the charge control in line with forecast costs in the last year of the charge control period. This provides us with a value of X for each of the charge control baskets reflecting expected cost reductions and the elimination of any super-normal profits existing at the start of the charge control period.
- 4.123 If we apply adjustments to starting charges under Stage 4, this would also impact the value of X. For example, if we applied a one-off downward adjustment to the starting charge this would mean that the value of X required to bring prices in line with

⁸⁸ Such as the decline forecast for TI services over the 2016 control period.

forecasts costs in the last year of the charge control period would be smaller in absolute terms.

- 4.124 We outline our specific decisions on the value of X for each charge control basket in Sections 5 and 6 and explain our methodology behind our calculations in more detail in Annex 26.

Section 5

Ethernet services

Introduction

- 5.1 In this Section we discuss our consideration of Stages 1 to 3 of our methodology⁸⁹ to design our charge control for Ethernet services, which include wholesale CISBO services up to and including 1Gbit/s that are provided outside the CLA and Hull.
- 5.2 In particular, we explain our decisions with regard to:
- **Stage 1: identifying the relevant services and appropriate charge control baskets and sub-caps**
 - adopting separate baskets for Ethernet and TI services;
 - adopting a broad basket for Ethernet services; and
 - adopting a number of sub-baskets⁹⁰ and sub-caps⁹¹ within the Ethernet basket.
 - **Stage 2: determining the base year costs for the services covered by the charge control**
 - basing the control on BT's costs of provision rather than on those of another operator;
 - using CCA FAC as our choice of cost standard;
 - adopting the MEA approach for modelling legacy Ethernet services;
 - using the 2014/15 RFS as our base year and making appropriate adjustments; and
 - making an adjustment to take into account required improvements in BT's quality of service.
 - **Stage 3: forecasting the costs of the services for the duration of the charge control**
 - our volume forecasting assumptions;
 - our efficiency forecasting assumptions;
 - our AVEs and CVEs assumptions;
 - our input price inflation change assumptions;

⁸⁹ As set out in paragraph 4.2 of Section 4, Volume II of this Statement.

⁹⁰ We use the term 'sub-basket' when referring to a control on a group of two or more charges.

⁹¹ A 'sub-cap' refers to a control on a single charge.

- our cost of capital assumption; and
- our decision to reflect the impact of the dark fibre remedy.

5.3 This section follows the framework for charge control design set out in Section 4. We discuss how we have assessed Stages 1 to 3 of the framework in relation to TI services in Section 6 and our assessment of Stages 4 and 5 of the framework for both Ethernet and TI services is set out in Section 7 of this statement.⁹² In addition, further details of how we have designed our charge controls and estimated costs and revenues can be found in Annexes 26-34.

Summary

We have implemented a single Ethernet basket with sub-basket and sub-cap controls

- 5.4 We have implemented a single charge control basket covering CISBO services up to and including 1Gbit/s outside the CLA (the Ethernet basket).
- 5.5 We are also implementing sub-baskets and sub-caps where we believe that the overall basket cap will not offer sufficient protection to customers. Table 5.1 below summarises the structure of the Ethernet basket, together with our sub-basket and sub-cap constraints.

Table 5.1: Scope and structure of the Ethernet basket and sub-basket and sub-cap constraints

Basket	Service within scope	Sub-basket and sub-cap constraints
Ethernet basket	Connection, rental and main link charges for: Wholesale CISBO services up to and including 1Gbit/s outside the CLA.	Sub-basket for EAD and EAD LA 1 Gbit/s.
	Interconnection services and Cablelink	Sub-basket on main link charges.
	Ethernet ancillary charges (excluding ECCs, TRCs and Accommodation).	Sub-basket on interconnection services and Cablelink.
		Sub-basket on each combined rental and connection charge.
		Sub-cap on each and every charge (excluding ancillary charges with less than £1m annual revenue).

Source: Ofcom

⁹² Our decisions in relation to discounts, which were set out in Section 5 of our June 2015 LLCC Consultation, are set out in Annex 34 of this statement.

We have determined the appropriate base year costs for the services covered by the charge control

- 5.6 Our typical approach to setting charge controls for BT's services is to allow BT to recover its incremental costs of provision plus an appropriate mark up to allow for the recovery of common costs. We have adopted the CCA FAC cost standard to determine the appropriate mark up for common costs for this Ethernet charge control.
- 5.7 We have adopted the MEA approach for modelling legacy Ethernet services up to and including 1Gbit/s. This means that we model legacy Ethernet services based on the most efficient technology that delivers the same service, to the same level of quality and to the same group of customers; namely Openreach's more recent Ethernet Access Direct (EAD) technology.
- 5.8 We have adjusted BT's 2014/15 RFS cost data to ensure that it is representative of the relevant level of costs for forward-looking charge control purposes, while remaining consistent with the principle of allowing BT to recover its efficiently incurred costs. We have made a number of adjustments to ensure that the base year cost data is a suitable basis for forecasting costs for the purposes of setting the charge control.

We have taken required improvements in BT's QoS into account in forecasting costs

- 5.9 We have implemented adjustments to allow BT to recover its efficiently incurred quality of service costs from the charge control. We have made two broad adjustments to BT's cost base in order to reflect the changes to BT's QoS expected over the control period:
- an uplift to the 2014/15 base year costs⁹³ to reflect the additional provisioning resources BT has put in place to improve performance; and
 - a reduction in the 2014/15 base year costs to reflect the forecast reduction in penalty payments BT will pay to its customers under the Service Level Agreement (SLA)/Service Level Guarantee (SLG) regime for poor provisioning performance, when QoS improves.

We forecast significant Ethernet volume growth until 2018/19 but expect some cannibalisation by the dark fibre access remedy

- 5.10 We have generated volume forecasts for Ethernet and other CISBO services which show significant volume growth, particularly for bandwidths of 100Mbit/s and higher. This is likely to be driven by increasing demand for bandwidth-intensive activities and applications, the deployment of Next Generation Access (NGA) and 4G mobile networks, and the lower unit cost of Ethernet.

⁹³ We include an adjustment to BT's base year costs to reflect the additional resources it has deployed to improve quality of service. We do not make further adjustments in later years of the control period, but rather will forecast how the adjusted base year costs will evolve over time consistent with our general modelling approach.

- 5.11 We have also adjusted the Ethernet volume forecasts to take account of the availability of dark fibre as we consider this will affect the volume of active Ethernet circuits BT will sell in this review period. We have assumed:
- no cannibalisation of existing circuits for CISBO services in the second year of the control (the first year that the dark fibre will be commercially available, and we note that this will be mid-year 2017/18);
 - cannibalisation of existing circuits for CISBO services in the final year of the control, resulting in around 3.0k forecasted existing active circuits in 2018/19 using dark fibre instead;
 - cannibalisation of new connections (and associated rentals) for CISBO services in the second year of the control (the first year that the dark fibre will be commercially available, and we note that this will be mid-year 2017/18), resulting in around 4.9k forecasted new active connections in 2017/18 using dark fibre instead;
 - cannibalisation of new connections (and associated rentals) for CISBO services in the final year of the control, resulting in around 18.2k forecasted new active connections in 2018/19 using dark fibre instead; and
 - no incremental aggregation as a result of dark fibre in this control period (beyond what is already included in our forecasts for active services).

We have used an efficiency assumption of 5.0% for Ethernet services

- 5.12 We have adopted efficiency targets for Ethernet services of 5.0% per annum for operating costs and 4.0% for capex, based on a consideration of various sources of evidence.

We have adopted base year elasticities derived from BT's LRIC model

- 5.13 We have estimated our base year AVEs and CVEs for the components in the Ethernet basket using Ofcom calculated LRIC to FAC ratios, derived from the outputs of BT's 2014/15 LRIC model.

We have derived AVEs using GRC weights

- 5.14 We have concluded that, consistent with our proposals in the November 2015 LLCC Consultation, it is appropriate to use GRC weights when calculating AVEs for the Ethernet basket components. As the resulting AVEs are applied to GRC under our modelling approach, we consider the use of GRC weights in calculating the AVEs is more internally consistent than NRC weights.

We have adopted a dynamic elasticities approach

- 5.15 We have concluded that, consistent with our proposals in the November 2015 LLCC Consultation, it is appropriate to forecast the costs of Ethernet services using dynamic AVEs and CVEs that adapt to the change in the mix of incremental costs and fixed and common costs over the control period.

We have adopted a revised access fibre AVE assumption

- 5.16 We have estimated the access fibre AVE to be 0.44 on the basis of historical costs and volumes. Access fibre costs are relevant to a number of Ethernet components, including one of the main components used by EAD services, EAD Fibre. Exceptionally, we consider that BT's LRIC model outputs do not provide a reliable estimate of how these costs respond to changes in volumes when volumes are growing. We have therefore revised the LRIC to FAC ratio for the access fibre cost category to 0.44 based on historical cost and volume data covering the period 2011/12 to 2014/15.⁹⁴

We have adopted pay inflation of 3% and other non-pay inflation of 2.1%

- 5.17 We have adopted the following input price inflation assumptions:
- pay inflation at 3.0%; and
 - where a specific rate for a non-pay cost item can be identified, we set the modelled rate at that value. We have identified specific rates for energy, accommodation and cumulo rates costs. We have assumed inflation for all other non-pay costs at forecast CPI. Weighting these together produces a final non pay inflation assumption of 2.1% per annum for Ethernet services.

We have adopted asset price change assumptions consistent with other recent charge controls

- 5.18 We have adopted asset price change assumptions such that duct and copper are valued through the RAV-based approach (RPI inflation) and all other asset prices (for example for fibre, electronics and software) are assumed to stay constant (flat in nominal terms).

We have adopted a pre-tax nominal cost of capital of 9.8%

- 5.19 We have decided to use a pre-tax nominal Other UK telecoms WACC of 9.8% in the 2016 LLCC Model for both Ethernet and TI services. This is based on a three-way disaggregation of the BT Group WACC (Openreach copper, Other UK telecoms services, and RoBT). Our underlying assumptions and analysis are set out in Annex 30.

We have made certain adjustments to our cost and revenue forecasts to reflect the dark fibre remedy

- 5.20 We believe that the cannibalisation of active circuits by the dark fibre remedy is likely to affect BT's ability to recover its efficiently-incurred costs, including those costs that are non-avoidable, i.e. they are still incurred regardless of whether the dark fibre is being supplied instead of an active circuit. We therefore have made three adjustments to our cost forecasts to ensure that BT has the opportunity to recover its costs:

⁹⁴ An access fibre AVE of 0.44 leads to a weighted average AVE for the EAD Fibre component of 0.45.

- uplift the Ethernet basket cost forecast to ensure BT recovers its efficiently incurred common costs in light of the use of the dark fibre remedy instead of BT's active circuit. This common cost uplift is approximately £1.3m in total in the final year of the control, as set out in Annex 33;
- uplift the Ethernet basket cost forecast to ensure BT recovers its efficiently incurred equipment costs in light of the use of the dark fibre remedy to replace existing active circuits. This stranded asset uplift is approximately £0.7m in total in the final year of the control, as set out in Annex 33; and
- include passive implementation costs in the Ethernet basket of approximately £[>] in the final year of the control, as set out in Annex 33.

Stage 1: Identify relevant services and appropriate charge control basket structure

5.21 In Section 4, we set out our principles for basket design. Based on a consideration of these principles, below in this section we set out our decisions in relation to basket design for Ethernet services.

We have adopted separate TI and Ethernet baskets

June 2015 LLCC Consultation

5.22 In the June 2015 LLCC Consultation we proposed to adopt separate TI and Ethernet baskets.

Stakeholders' comments

5.23 BT, GTC and Virgin agreed with the proposal for separate TI and Ethernet baskets.⁹⁵ No other stakeholders commented on this proposal.⁹⁶

Our conclusions

5.24 We have decided to maintain separate baskets for TI and Ethernet services. This approach is consistent with the BT Undertakings.⁹⁷ A combined basket would require Openreach and BT Wholesale to agree on a set of prices for TI and Ethernet services that is compliant with the requirements of a broad basket. This would require the two divisions to share information,⁹⁸ in order to inform commercial strategies on pricing, migration and cost recovery in such a way that would conflict with the BT Undertakings that require Openreach to be run separate to the rest of BT. In this scenario, BT Wholesale would have a role in setting prices for Ethernet services that

⁹⁵ BT response to the June 2015 LLCC Consultation, paragraph 145; GTC response to the June 2015 LLCC Consultation, page 1; Virgin response to the June 2015 LLCC Consultation, page 4.

⁹⁶ Talk Talk noted that the most obvious way of encouraging migration from legacy products would be to include TI and CI in the same basket, but that this was prevented by the Undertakings. They suggested that common costs be reallocated from the CI basket to the TI basket. We address Talk Talk's comment in Section 6.

⁹⁷ *BT Undertakings given to Ofcom by BT pursuant to the Enterprise Act 2002*, 19 June 2014, http://stakeholders.ofcom.org.uk/binaries/telecoms/policy/bt/Consolidated_Undertakings24.pdf

⁹⁸ For example on pricing, costs, forecasts and product development.

it purchases along with other CPs, which would be inappropriate given its incentives to ensure price changes would benefit itself relative to its competitors.

- 5.25 Furthermore, we also consider that the use of separate TI and Ethernet baskets is consistent with our market definition proposals Volume I of this statement. As discussed in Section 4, there are cases where products in different markets can be put in the same basket, particularly where they share common costs and the intensity of competition is similar. But in this case, we do not consider the competitive conditions and market trends to be similar between TI and Ethernet. As we set out in Volume I of this statement, we consider TI to be a legacy market in overall decline, in contrast to Ethernet where we expect continued growth.⁹⁹ We do not expect new demand or competition within the TI segment.¹⁰⁰ We therefore consider that adopting separate baskets is consistent with the differences in competitive conditions and market trends between TI and Ethernet.
- 5.26 Given these considerations, we do not consider that TI and Ethernet should be combined in a single basket.

We have decided to adopt a broad Ethernet basket

June 2015 LLCC Consultation

- 5.27 We proposed to have a basket that includes all Ethernet services at bandwidths up to and including 1Gbit/s.
- 5.28 We considered Vodafone's arguments that Ofcom should impose a tighter charge control with smaller baskets. We also considered CityFibre's arguments that Ofcom should impose price floors in the charge control in order to balance short-term efficiencies and investment incentives to CPs and BT.

Stakeholders' comments

- 5.29 BT, GTC, Virgin and [3<] agreed with our proposals for a broad Ethernet basket.¹⁰¹
- 5.30 UKCTA did not agree with Ofcom's proposal to adopt broad baskets for Ethernet and TI services. In its view, such an approach allows too much freedom to BT to set charges for individual services within the basket, which can lead to distortions in competition due to charge reductions being focused on services utilised by its own downstream business. UKCTA also argued that Ofcom places significant reliance on the fact that it has adopted broad baskets in previous controls, and points to the fact that BT has been found to have been pricing excessively in these markets during this time as an indication that this approach is not working.
- 5.31 According to UKCTA, smaller, targeted baskets would still allow a degree of flexibility to address patterns of demand and set relative prices for each service in the basket, while addressing concerns regarding the potential for competitive distortions.¹⁰²

⁹⁹ Sections 4 and 5, Volume I.

¹⁰⁰ Section 5, Volume I.

¹⁰¹ BT response to the June 2015 LLCC Consultation, paragraph 144; GTC response to the June 2015 LLCC Consultation, page 1 and 3; Virgin response to the June 2015 LLCC Consultation, page 4; Vodafone response to the June 2015 LLCC Consultation, page 48; [3<] response to the June 2015 LLCC Consultation, page 19.

¹⁰² UKCTA response to the June 2015 LLCC Consultation, paragraphs 2.20-2.24.

UKCTA also stated that a broad basket approach will only work if BT is able to cross-subsidise its loss on lower priced services from margins earned on higher priced services.

- 5.32 Talk Talk argued that, while our proposed sub-baskets and sub-caps were better than no pricing constraints at all, they are not adequate to address excessive charging.

Our conclusions

- 5.33 We acknowledge that a broad basket introduces potential risks that BT may charge higher prices for products that are largely purchased by other communications providers (OCPs) or for products that are less competitive. However, as discussed in Section 4 we believe that such risks can be mitigated through the use of sub-caps.
- 5.34 As set out in Section 4, in determining the design of charge control baskets, we have sought to address the following considerations:
- **consistency with other rules** – our design of baskets should take into account other rules and ensure that it does not require BT to breach these other rules;
 - **efficient charging structures** – where the services being considered share substantial common costs, a single basket is more conducive to efficient charging structures and cost recovery;
 - **competition** – where the services being considered face different competitive conditions or where BT does not use the same wholesale inputs as its rivals, placing them in the same charge control basket may give BT an incentive to set prices in a way that undermines competition. In this case, we consider introducing sub-caps or placing the services in separate baskets; and
 - **migration incentives** – where it is appropriate for BT to encourage migration from a legacy service to a more efficient service, placing the services in the same basket would allow BT the required pricing flexibility.

Consistency with other rules

- 5.35 Consistency with other rules, such as the BT Undertakings, is an important consideration in our decision to have separate TI and Ethernet baskets. However, it is not a relevant consideration for determining basket design for Ethernet services only, because these pricing decisions are all made by Openreach.

Efficient charging structures

- 5.36 Ethernet services of different types and across different bandwidths are likely to share substantial common costs. As set out in Section 4, our preference is to provide BT the incentive to recover common costs in the most efficient way by placing the services in a single charge control basket. Regarding UKCTA's comment on cross-subsidisation, we note that any pricing flexibility given to BT is for the purpose of allowing it to vary its recovery of common costs across different services. This does not require BT to earn a loss on any individual service (that is, to charge a price below LRIC).
- 5.37 Furthermore, the alternative approach that UKCTA proposes is to set very narrow baskets such that the charge of each and every service would move towards the

forecast service-specific FACs. If we were to create separate baskets for different types of Ethernet service or for each bandwidth, or even for each individual charge, we would have to decide on the appropriate allocation of common costs to be recovered within each basket. Given the complexity of identifying the appropriate pattern of common cost recovery, particularly for a large number of services, and the benefits of having a degree of flexibility should this pattern change over time, we consider that it is appropriate that BT is afforded some flexibility to identify the appropriate way for these costs to be recovered.

- 5.38 Further, setting relative prices of different circuits, e.g. by bandwidth and product, requires consideration of demand conditions, changes in costs (and demand) over time and competition. We believe that BT is in a better position than Ofcom to estimate which tariff structures are most likely to expand output and adjust prices in response to changing market conditions.
- 5.39 We therefore consider that the promotion of efficient charging structures and cost recovery would suggest it is appropriate to design a broad basket for Ethernet services.

Competition

- 5.40 In Volume I, Section 4, we have defined a market for wholesale CISBO services, which encompasses Ethernet and WDM services of all bandwidths.¹⁰³ We note that, within this market, BT earns higher margins on very high CISBO services than it earns on medium and high CISBO services. This has made it easier for OCPs to win business at the higher bandwidth ends of the market and this in turn is reflected in variations in service share by bandwidth. On the one hand, the high margins suggest that there could be a concern about the risk of excessive pricing but, on the other, while these margins persist, there may be potentially greater prospects for competition and infrastructure investment for very high bandwidth CISBO services, i.e. WDM services and leased lines above 1Gbit/s. In addition, our intention is that competition based on passive remedies should provide the primary constraint on prices for very high CISBO services, rather than a charge control. These differences have been reflected in the charge control remedies that we have decided in Volume I, for example, BT's WDM services and Ethernet services above 1Gbit/s outside the London Periphery will be subject to a safeguard cap and so are not included in our charge control basket.
- 5.41 We consider that there is currently no clear evidence to indicate that BT charges relatively higher prices for products that are less competitive (though we note that, by design, competitive conditions across the services in our proposed baskets are reasonably homogeneous). For example, since the start of the previous control it has generally adopted uniform geographic pricing to services that are charge controlled.¹⁰⁴
- 5.42 If there were substantial differences in the extent to which different bandwidth services were sold to internal and external customers, such that BT did not consume the same wholesale inputs as its rivals, this may be another reason for considering placing the services in different charge control baskets. Where there are substantial differences in purchasing patterns, BT may have an incentive to concentrate price cuts on internally consumed products and discriminate against external customers,

¹⁰³ Paragraph 4.2, Section 4, Volume I

¹⁰⁴ With the exception of discounts applied to EAD 1Gbit/s connections in 2014/15 in the WECLA.

leading to a distortion in competition, if the services were placed under a single basket cap.

- 5.43 However, as discussed in Section 4 we believe this risk can be mitigated by the use of sub-baskets and sub-caps within a broad basket. This has the benefit of preventing BT from setting excessive charges while, at the same time, retaining the benefits of pricing flexibility. We discuss our sub-basket and sub-cap decisions later in this section.

Migration incentives

- 5.44 We consider that it is appropriate for Openreach to have the flexibility to adjust the relative price of legacy and new Ethernet service charges to promote efficient migration. The decision over whether to migrate to a new Ethernet service is made by customers and Openreach may therefore need to adjust relative prices in order to encourage migration where it is efficient to do so. Such changes to the relative prices of services may require the two types of service to be placed in the same charge control basket.
- 5.45 This is also consistent with our decisions to adopt the MEA approach to pricing, which involves modelling legacy services, such as Wholesale Extension Service (WES) and Backhaul Ethernet Services (BES), on the basis of the most efficient way of delivering the service. If the services were kept in separate charge control baskets, the ability of Openreach to set relative prices would be restricted. Therefore, we consider that allowing for migration incentives supports the case for having a broad Ethernet basket.

Conclusion

- 5.46 We have adopted a broad Ethernet basket covering the main controlled Ethernet services provided by Openreach. This is because we consider that competitive conditions in the provision of different bandwidths of CISBO services are broadly homogeneous, so we do not have serious concerns that BT could have a distorted incentive to cut prices more where it faces more competition or that there are competition issues that we are unable to address through sub-baskets or sub-caps.¹⁰⁵ In addition, a single basket is more conducive to efficient pricing and cost recovery and would allow Openreach to use prices to provide customers with incentives to migrate to lower-cost products.
- 5.47 Within this broad basket, we have considered the need for any sub-baskets or sub-caps. Our consideration of these is significantly influenced by the potential impact of our dark fibre remedy and so we discuss sub-baskets and sub-caps below, at the end of this section, after we have set out our decisions in relation to the impact of dark fibre remedy on the Ethernet charge control.

Stage 2: Determine base year costs

- 5.48 As set out in Section 4, in formulating our decisions to set the charge control, we need to be able to determine all costs relevant to providing charge-controlled services. We first need to determine the relevant cost standard for which we can establish base year costs. Once we have determined appropriate base year costs, we have a relevant reference point from which we can forecast BT's future costs

¹⁰⁵ Section 4, Volume I.

based on anticipated efficiency gains, volume changes and the estimated impact of volume changes on BT's costs. Below, we set out our conclusions on:

- whether to base the control on BT's costs of provision or those of another operator;
- the choice of cost standard;
- the technology upon which we base our cost forecasts;
- the data period used for the base year;
- the adjustments we have made to the base year; and
- the adjustment to take into account required improvements in BT's quality of service.

We have based our cost forecasts on BT's costs rather than those of another operator

June 2015 LLCC Consultation

5.49 In our June 2015 LLCC Consultation, we proposed to base our cost forecasts on BT's costs rather than those of another operator.

Stakeholders' comments

5.50 BT agreed that its costs should be used as the base for Ofcom's forecast cost subject to suitable adjustments.¹⁰⁶

5.51 Virgin said it "*agrees with the use of BT's cost base from a productive efficiency perspective*" and that "*the use of CCA FAC is an appropriate cost standard*".¹⁰⁷

5.52 Vodafone responded that Ofcom should seek to base pricing on that of an efficient provider, either by building a bottom up model or adjusting BT's costs to reflect efficient provision.¹⁰⁸

5.53 CityFibre disagreed with our proposal to use BT's costs rather than those of another operator. CityFibre argued that:

- Taking BT's CCA FAC as the cost base and using a CPI-X% glide path is not appropriate for a regulatory approach which is intended to encourage dynamic efficiency and infrastructure competition.
- Our consultation approach would result in the transfer of market share back to BT, [3<] and result in monopoly network infrastructure which, while low cost in the short term, will not deliver long term efficiency.¹⁰⁹

¹⁰⁶ BT response to the June 2015 LLCC Consultation, paragraph 80.

¹⁰⁷ Virgin response to the June 2015 LLCC Consultation, page 5.

¹⁰⁸ Vodafone response to the June 2015 LLCC Consultation, page 49.

¹⁰⁹ CityFibre argued that the widespread availability of fibre networks in the future would provide

- The costs of constructing all-fibre networks will differ from BT's historical costs, and the use of CCA adjustments is unlikely to be sufficient to reflect the differences in cost structure.
- BT's scale is not replicable by CPs without considerable investment in new infrastructure, and [X].
- More efficient network infrastructure may appear to be more costly than less efficient infrastructure due to differences in economies of scale. They state that, if CityFibre's market share in a town were broadly equivalent to that of BT's current share in the rest of the UK, their current cost-based charges would be [X]% lower than BT's, whereas under our consultation proposals (and without BT's market share in a town) their charges at the end of the control period would be [X]% higher than BT's.¹¹⁰
- Our approach fails to ensure adequate economic space between the different stages on the investment ladder, and that *"NRAs must ensure that investment incentives are such that alternative operators are able to replicate the incumbent's infrastructure where this is technically possible and economically feasible."*¹¹¹

5.54 CityFibre stated that maintaining prices at their current level with a CPI-CPI safety cap would allow wholesale market entry at all levels of the value chain and retain investment incentives. CityFibre claimed that the Irish regulator ComReg, in its approach to the wholesale leased line market,¹¹² highlights the non-eviction principle and the application of an appropriate economic space. They added that the European Regulators Group (ERG), in its Common Position papers,^{113 114} supports the concept of an appropriate economic space between wholesale products.¹¹⁵

5.55 As an alternative to our consultation proposals, CityFibre suggested that we should base our cost forecasts on a principle of "reasonable costs", either using a Modified Equally Efficient Operator (MEE0) approach or a Reasonably Efficient Operator (REO) approach. CityFibre noted that our analysis in our statement¹¹⁶ on the

competitive pressure on BT leading to greater levels of efficiency in the market as a whole. CityFibre highlighted an extract from the EC European Access Directive which states that *"The imposition by national regulatory authorities of mandated access that increases competition in the short-term should not reduce incentives for competitors to invest in alternative facilities that will secure more competition in the long-term"*. Proposal for a Directive of the European Parliament and of the Council on access to, and interconnection of, electronic communications networks and associated facilities, OJ C 365E

¹¹⁰ CityFibre also noted that unit prices could be improved further if CityFibre's network services (such as residential and business broadband and telephony) were factored into the model as they are in BT's case.

¹¹¹ Cited by CityFibre in its response, taken from:

http://berec.europa.eu/doc/publications/erg_09_21_erg_report_on_price_consistency_in_upstream_b_b_markets_090603.pdf

¹¹² ComReg: A final decision further specifying the price control obligation in the market for wholesale terminating segments of leased lines. Document 12/03 Decision D02/12 2 February 2012

¹¹³ Report on ERG best practices on regulation regimes in wholesale unbundled access and bit stream access: ERG (07) 53 WLA WBA BP final 080604

¹¹⁴ Report on price consistency in upstream broadband markets June 2009: ERG (09) 21

¹¹⁵ They also noted that ARCEP, in its leased lines market analysis, sets out an approach regarding the application of the non-eviction principle, which ensures that wholesale tariffs set by France Telecom do not evict operators that have deployed their own infrastructure.

¹¹⁶ Ofcom, Fixed Access Market Reviews: Approach to the VULA margin, 2015,

approach to the VULA margin resulted in the use of a MEE0 approach to assessing costs, whereby BT's costs were adjusted to compensate for advantages BT may have.

- 5.56 CityFibre also argued that it is necessary to define a price floor for BT's active products in order to maintain economic space and provide a degree of protection against opportunities BT may have to price tactically and hence undermine CPs.¹¹⁷ It calculated that the price floor should be around 10-15% below BT's current active prices.¹¹⁸
- 5.57 CityFibre cited ComReg's 2012 Wholesale Leased Lines Decision¹¹⁹, in which ComReg stated that "the imposition of a price floor for WLLs should encourage [Other Authorised Operators] OAOs onto the ladder of investment and encourage infrastructure investment while promoting sustainable competition in the retail market, based on the pricing mechanism established in this decision."
- 5.58 CityFibre acknowledged that its proposals could lead to BT making substantial accounting profits on delivering those services over the period of the change control. They proposed that, in order to address concerns that BT may use such profits to cross-subsidise services in other competitive markets, Ofcom could consider measures to encourage BT to deploy its profits in this area towards improving and extending fibre infrastructure networks in the UK.

Our conclusions

BT's costs rather than those of another operator

- 5.59 For the reasons set out below we have decided to base our cost forecasts on BT's costs of providing business connectivity services rather than those of another operator. These costs are based on a CCA FAC approach to BT's costs of supplying leased line services. The costs are based on BT's existing network configuration and the costs of supplying on a national basis, excluding the CLA and Hull.
- 5.60 We consider that this cost base has the following desirable properties:
- It provides appropriate economic signals for efficient entry or network replacement;
 - It ensures that BT is able to recover efficiently incurred costs;
 - It is practicable to implement;
 - It is robust and evidence-based;

http://stakeholders.ofcom.org.uk/binaries/consultations/VULA-margin/statement/VULA_margin_final_statement.pdf

¹¹⁷ They suggested that price floors should be based on a forward-looking bottom-up model, calculating the prices that would be needed to provide a reasonable return to investors and assuming that each operator is able to achieve a substantial but non-dominant market share.

¹¹⁸ CityFibre response to the June LLCC Consultation, paragraph 6.6.4,

<http://stakeholders.ofcom.org.uk/binaries/consultations/bcmr-2015/responses/CityFibre.pdf>

¹¹⁹ ComReg: *A final decision further specifying the price control obligation in the market for wholesale terminating segments of leased lines. Document 12/03 Decision D02/12, 2012*

- It is transparent;
- It is stable, leading to consistent decisions over time; and
- It is consistent with past valuation and regulatory decisions.

5.61 We agree with CityFibre that a regulatory approach should encourage dynamic efficiency and infrastructure competition. We consider that our approach encourages such infrastructure competition where it is efficient.

5.62 Our charge control is set on a CCA FAC basis.¹²⁰ This values BT's assets on the basis of their current replacement costs. In principle, the use of a CCA approach provides efficient buy or build signals as it values the regulated asset at its current replacement cost. Charges set on this basis therefore provides an objective basis to set charges which should encourage entry where the entrant is as efficient as BT. As stated by Analysys Mason:

“Alternative operators should therefore be indifferent as to whether to invest in new assets, or buy regulated wholesale assets.”¹²¹

5.63 CityFibre's objection to the use of CCA FAC appears to relate not to the use of CCA FAC as an accounting methodology, but to basing the cost base on BT's network topology and, in particular, reflecting BT's economies of scale and scope. CityFibre claimed:

“New all-fibre high-penetration networks are designed differently to BT's legacy network and so the costs of constructing these networks will differ from BT's historical costs. The use of CCA adjustments is unlikely to be sufficient to reflect the differences in cost structure and CityFibre therefore believes that the cost base used for price regulation of business connectivity products should take account of these network topology differences.”¹²²

5.64 Although CityFibre claim that 'new all-fibre' networks will have a different design to BT's legacy network, it is not clear that such a design would result in an entrant necessarily having higher costs than that of BT's network for two reasons.

5.65 First, BT's fibre network for Ethernet leased lines is relatively new such that BT's cost base reflects the need for significant ongoing investment. Like CityFibre's network, BT's Ethernet leased line services are all delivered over fibre, and that this is an area where BT continues to make significant investments. The costs of this investment are high and are reflected in our charge control. In our base year 2014/15, BT's capital expenditure on leased lines services was [£<], indicating continuous investment in this service. We further observe that BT's current NRC:GRC ratio for Ethernet

¹²⁰ One notable exception to CCA FAC is the use of a HCA valuation to BT's pre-1997 duct. This adjustment (known as the Regulatory Asset Value) was made to prevent windfall gains to BT from the change of accounting policy from HCA prior to 1997, to CCA thereafter. Ofcom's decision to apply a RAV was upheld by the Competition Commission in the LLU/WLR Charge Control Review 2012 Appeals. The RAV has a very minor impact on this charge control. For example, in 2013/14, it reduced BT's Ethernet asset base by just £10m.

¹²¹ Analysys Mason, "Alternative methodologies for the valuation of BT's duct assets – public version", 2010, <http://stakeholders.ofcom.org.uk/binaries/consultations/wlr-cc-2011/annexes/duct-assets.pdf>

¹²² CityFibre response to Ofcom's June LLCC consultation, Paragraph 6.3.2

services is [3<], and [3<] for duct and fibre combined. These rates are not consistent with a heavily depreciated network and show that BT needs to continue to invest in new network construction to serve customers. As our charge control is set on a replacement cost basis, it reflects the cost of serving customers with modern infrastructure.

- 5.66 Second, it is correct that a new network is likely to have a different network topology to BT's network which was originally constructed to provide telephony services. However, such a new network topology may not necessarily have higher costs than legacy networks. New networks can take advantage of advances in network design, and can build networks which are more closely aligned with current demand, avoiding unnecessary routes. For example, a modern network is likely to be constructed as a fibre ring, rather than following BT's exchange network. While BT's network build may have been efficient at the time of its construction, it may not be optimal under today's conditions.¹²³ In using BT's cost base, we have used BT's existing network topology and have not optimised it to reflect how a new entrant would construct its assets. As Analysys Mason note in its review of methodologies for the valuation of BT's duct assets:

“..optimised methodologies are likely to value the network at a discount. To the extent to which conditions and technologies have changed, optimised methodologies could exclude a substantial amount of reasonably incurred cost”.¹²⁴

- 5.67 Consequently, setting a charge control based on BT's network topology should not necessarily be expected to disadvantage a new entrant.
- 5.68 We do however acknowledge that BT's existing economies of scale and scope may mean that, all else being equal, BT is likely to have lower costs than a new entrant, as it is able to spread its costs across many customers and services. In this respect, setting a control based on BT's economies of scale may place a new entrant at a disadvantage. However, we consider that this potential disadvantage has to be set in context.
- 5.69 BT has an obligation to provide services on a national basis. This includes a mixture of geographic areas, some of which will have significant economies of scope and density, but also others where such economies are lower and so the cost of supply is much higher. Our charge control covers all of the UK apart from the CLA and Hull. Our charge control (and BT's prices) are set on a national basis, so that BT's charges are likely to be higher (possibly significantly so) than its costs in the highest density areas where entry is most likely – and conversely lower than its costs in the least dense areas. As new entrants tend to target geographies where demand is concentrated and so costs of supply are relatively low, a national average charge control is likely to set charges which are above BT's true costs of supply in competitive areas.

¹²³ Although BT's network topology may not be optimal today, that does not mean that BT's investment decisions have been inefficient. BT's investment decisions may have been efficient at the time, given BT's existing assets, and so reducing BT's costs to that of an optimised network may deny BT the opportunity to recover its efficiently incurred costs.

¹²⁴ Analysys Mason, March 2010, page 30, “*Alternative methodologies for the valuation of BT's duct assets - Public version*” Available at: <http://stakeholders.ofcom.org.uk/binaries/consultations/wlr-cc-2011/annexes/duct-assets.pdf>

- 5.70 We consider that using BT's costs creates scope for wholesale market competition and entry, particularly in geographic areas where costs are lower. For example, CityFibre's analysis behind its claim that its business model is more efficient than that of BT compares CityFibre's costs in cities with BT's costs nationally.¹²⁵ It is likely that, were CityFibre or another alternative infrastructure provider to have a market share similar to BT, and so were also offering their services in less dense, more rural areas, their average costs (excluding economies of scale) would likely be higher than where services are only offered in denser, urban areas. Additionally, our analysis suggests that BT faces stronger competition in those areas where costs are lower.¹²⁶ Our decision not to allow geographic pricing discounts to count towards BT's compliance with the charge control will further enable competition with BT in those areas where costs are lower. In addition, we are imposing lighter touch regulation on dark fibre and bandwidths above 1 Gbit/s which allows the charges for these circuits to be higher than BT's FAC costs. This again provides scope for a new entrant to target higher margin circuits.¹²⁷
- 5.71 We consider that CityFibre's analogy with the approach in VULA is misplaced. In VULA we did not model the wholesale costs of a hypothetical EEO or REO, but instead required BT to set a margin between its wholesale and retail prices that would be consistent with the promotion of retail competition, in particular allowing an operator with slightly higher costs than BT to profitably provide retail NGA broadband services. This retail margin obligation was imposed, in part, due to the absence of cost regulation on the wholesale product, which meant that BT had the ability to control both wholesale and retail prices. We do not consider, therefore, that the reasons for adopting an adjusted EEO approach for the retail margin in VULA are analogous to setting wholesale charges for leased lines.
- 5.72 In addition to setting efficient price signals, we note that there are additional advantages with basing a charge control on BT's costs. Using BT's costs is practicable to implement as BT's costs are known, being based on a pre-existing national network. If we were to base costs on those of a new entrant, there is uncertainty over what network topology to assume, and whether to assume that the entrant would operate nationwide, while in practice nationwide entry may be unlikely. Using BT's costs therefore means that our cost-modelling decisions are robust and evidence-based. It also increases the transparency of our decisions as BT's costs for regulated services are published annually in the RFS, allowing stakeholders to scrutinise our decisions.
- 5.73 Using BT's costs also has the benefit of leading to consistent decisions both over time, and between other regulated markets. Part of the network used to deliver BCMR services is also used to deliver a number of other services, including consumer broadband and telephony. Using BT's costs allows us to take account of this shared usage, using a common set of regulatory accounts, to ensure that regulatory decisions are consistent and providing BT with the opportunity to recover

¹²⁵ Cityfibre response dated 17th September 2015 to question 6 of the 13th s135 notice dated 10th September 2015

¹²⁶ Section 4, Volume I

¹²⁷ We also note that if CityFibre is correct (which we have not been able to verify) that its costs will be lower than BT's when it achieves economies of scale, then it should take this into account when making its entry decisions. In markets with high upfront costs and economies of scale, it is not unusual for new entrants to make losses in early years, which are compensated by higher returns in later years.

its efficiently incurred costs across markets.¹²⁸ Using BT's costs also allows us to be consistent with past valuation and regulatory decisions. Using the costs of a hypothetical entrant would raise significant concerns of inconsistency between controls, and over time, opening scope for both under and over-recovery of costs.

5.74 In summary, we consider that our approach to setting charges creates scope for efficient new entry as:

- we use a CCA valuation which values BT assets at their current replacement costs¹²⁹;
- Ethernet services are delivered by BT over a fibre network. BT's fibre assets are relatively new, and its costs reflect significant ongoing investment in this area;
- new entrants can benefit from advances in network design, which allow them to optimise their network for current services, and current demand, leading, all else being equal, to lower costs than using an existing network; and
- although BT has economies of scale and scope, this is offset, at least in part, by the fact that its controls reflect national average costs, whereas new entrants tend to target geographies where demand is concentrated and so costs of supply are lower. We also note that very high CISBO services are not in the charge control basket, so that it is possible for these circuits to be priced at a level above BT's FAC.¹³⁰

5.75 We therefore consider that our charge control provides scope for new entry where it is efficient. This position is supported by Virgin, who has expressed no concerns with the use of BT's CCA FAC, which it cites as being consistent with "productive efficiency". We note that Virgin's Project Lightning envisages significant network expansion over the forthcoming charge control period. We also note that, since our charge control consultation proposals, CityFibre has continued to make new investments, suggesting that it continues to see new investment opportunities.¹³¹

5.76 We consider that this decision is consistent with the approach outlined by the ERG. We note that, in the same document cited by CityFibre, the ERG states that "*NRAs should take into account the potential drawbacks of creating (too much) economic space, including the possibility of higher prices for underlying wholesale and retail products, or creation of incentives for inefficient entry, which may lead to inefficient duplication.*"¹³² We believe that basing the costs for the charge control on a MEE0's or REO's costs would lead to higher pricing for Ethernet products, which could lead to some of the drawbacks cited by the ERG.

¹²⁸ We note that charge controls for regulated services are not always simultaneous, but changes to allocations over time should not be biased in any particular direction, leading to an expectation of cost recovery over time.

¹²⁹ An exception to CCA valuation is pre-1997 access duct which is valued on a HCA basis. This valuation basis (known as the Regulatory Asset Valuation or RAV) is to prevent BT having windfall gains from the change from HCA to CCA accounting. The value of the RAV for the Ethernet basket was just £10m in 2013/14.

¹³⁰ We discuss the impact of dark fibre pricing on efficient entry in Annexes 20 and 21.

¹³¹ For example, see <http://www.cityfibre.com/news/2015/12/14/cityfibre-acquires-kcoms-national-network-assets-for-90m-facilitated-by-180m-fundraising>

¹³² *ERG Report on price consistency in upstream broadband markets*, 2009, section 3.4, http://berec.europa.eu/doc/publications/erg_09_21_erg_report_on_price_consistency_in_upstream_b_b_markets_090603.pdf

Price floors

- 5.77 We have also rejected CityFibre's proposals for price floors. Our primary concern in this charge control is the risk of excessive pricing, rather than prices that are too low. We do not see a need in this control to introduce additional safeguards on too low prices, beyond those which BT is already subject to under competition law. We note that the LRIC of a Dominant Provider is commonly used as a benchmark for anti-competitive pricing, particularly given that an incumbent operator such as BT will not be aware of other companies' LRICs. For example, in our 1997 Guidelines, we stated that *"Because floors are intended to prevent excessively low pricing, they should, in principle, reflect BT's incurred costs, since this would provide a more appropriate guideline for anti-competitive low pricing than the incremental cost of an efficient operator"*.¹³³
- 5.78 As noted in our June 2015 LLCC Consultation, although a price floor may provide some incentive for BT's competitors to build and expand their networks; this would be at the expense of higher charges for leased line users, reducing allocative efficiency. We also do not consider that the expansion envisaged would address BT's SMP over the review period.¹³⁴
- 5.79 We note that, in the decision by ComReg cited by CityFibre, ComReg proposed a price floor on legacy technologies as part of a package of measures to ensure that there was sufficient economic space between a legacy product and newer technologies. This was to prevent the incumbent (Eircom) from offering low prices on the legacy technology in order to prevent OAOs from investing in new technologies. We consider that the reasons that ComReg imposed a price floor on Eircom's legacy technologies are not relevant in deciding whether to impose a price floor on BT's Ethernet products. We have not identified any risk that BT will offer lower prices on Ethernet products in order to prevent OAO's from investing in newer technologies and therefore the circumstances are different in the UK.
- 5.80 We have taken account of the interests of consumers, and in particular the impact on consumer prices of CityFibre's proposals. We believe that CityFibre's proposal that we should only impose a safeguard cap of CPI-CPI, as well as putting a price floor on BT's current active prices, would significantly reduce the benefits that we are implementing as part of our charge control, particularly as we believe that competing investment will still occur under our controls. We have estimated that, under our current proposals, the charge control on Ethernet services would save BT's customers around £700m.

Conclusion

- 5.81 As we stated in the June 2015 LLCC Consultation, we consider that setting our charge control based on BT's CCA FAC is consistent with efficient investment signals.

¹³³ See Oftel, *Guidelines on the operation of Network Charge Controls*, 1997, Annex C, C.7, http://webarchive.nationalarchives.gov.uk/20040104233440/http://www.ofcom.org.uk/static/archive/oftel/publications/1995_98/pricing/ncc1097.htm.

¹³⁴ We discuss this further in our SMP analysis for Ethernet services, Section 4, Volume I of this statement

- 5.82 We also consider that using BT's costs has the benefits of being practical to implement, robust and evidence-based, transparent and consistent with other regulated markets and with past regulatory decisions.

We have decided to use CCA FAC as our cost standard

June 2015 LLCC Consultation

- 5.83 In the June 2015 LLCC Consultation we proposed to use CCA FAC as our cost standard.
- 5.84 We also considered a number of submissions by TalkTalk relevant to our use of CCA FAC for this charge control.¹³⁵ These submissions related to how costs that are common between BT's regulated and non-regulated products (what TalkTalk refers to as "*intergroup common costs*" and what we refer to below as IGCCs) should be taken into account by Ofcom when setting regulated charges for leased line products. In particular, TalkTalk maintained that Ofcom should not take any IGCCs into account when setting leased line charges. We disagreed with TalkTalk, and proposed that it would be appropriate that regulated services share an appropriate allocation of BT's IGCCs.

Stakeholders' comments

- 5.85 BT, Virgin and Vodafone agreed with our proposal.¹³⁶ Virgin felt that it would be inappropriate and distortionary to exclude IGCCs from BT's cost base for this analysis.
- 5.86 GTC argued that it would not be appropriate for BT to recover all of its common costs from CPs, and that there needs to be a mechanism for allocating these costs between upstream and downstream services.
- 5.87 [X] noted that IGCCs have to be very carefully moderated as being efficient.
- 5.88 TalkTalk put forward further arguments as to why Ofcom should not take any IGCCs into account when setting leased line charges. It argued that:
- since BT only needs to recover part of its IGCCs in the downstream market, whilst other CPs need to recover their own IGCCs and some of BTs, even "*competitors who have lower underlying costs than BT may not be able to*

¹³⁵ TalkTalk, *Intergroup common costs*, October 2014, <http://stakeholders.ofcom.org.uk/binaries/telecoms/market-reviews/LLCC/TalkTalk.pdf>; A report for TalkTalk prepared by Alix Partners, *BCMR Call for Inputs: Common Cost Recovery*, June 2014, http://stakeholders.ofcom.org.uk/binaries/telecoms/market-reviews/LLCC/BCMR_Call_for_Inputs_Common_Cost_Recovery_A_report_for_TalkTalk_by_Alix_Partners_June_2014.pdf; and TalkTalk, *Allocating IGCCs*, December 2014, http://stakeholders.ofcom.org.uk/binaries/telecoms/market-reviews/LLCC/Allocating_IGCCs_TalkTalk_December_2014.pdf; TalkTalk, *Letter from Andrew Heaney, TalkTalk to David Brown and Marina Gibbs, Ofcom*, June 2014 http://stakeholders.ofcom.org.uk/binaries/telecoms/market-reviews/LLCC/Letter_TalkTalk_Ofcom.pdf.

¹³⁶ BT response to the June 2015 LLCC Consultation, paragraph 81; Virgin response to the June 2015 LLCC Consultation, page 5; Vodafone response to the June 2015 LLCC Consultation, page 49.

compete with BT” and therefore “*the current approach distorts ‘on the merits’ competition in downstream markets*”,¹³⁷

- the natural consequence of Ofcom's logic of avoiding the risk of inefficient entry (only) would be to set an ever higher (and above FAC) wholesale price to limit any entry;
- since the vast majority of competition in upstream markets is by operators who are active in both the upstream and downstream markets, the market in the CLA is competitive and unregulated, and arguably upstream-only operators could enter the downstream market; efficiency gains will significantly outweigh the efficiency losses in upstream markets from not recovering IGCCs in regulated products; and
- under the current approach Ofcom is creating a large distortion in the downstream market to remove a small distortion in the upstream market.

Our conclusions

5.89 We set out in Section 4 that our typical approach to setting charge controls for BT is to allow BT to recover the incremental costs of provision plus an appropriate mark-up to allow for the recovery of common costs. We also explained that in the context of determining the appropriate mark-up for common costs for this charge control, we have considered two main options; the use of CCA FAC or LRIC+EPMU (although, when implemented, the two approaches can be fairly similar). While we consider that both the CCA FAC and LRIC+EPMU options could reasonably be used as our cost standard, we have selected CCA FAC for the reasons set out below:

- the use of CCA FAC is consistent with the approach we have adopted for other recent charge controls (such as those set out in the June 2014 FAMR Statement and the June 2014 WBA Statement).¹³⁸ Consistency across the regulation of different services provided by BT ensures that it has the opportunity to recover its efficiently incurred costs, while minimising the risk of double recovery;
- monitoring BT's actual financial performance on a LRIC basis is not straightforward, as information on wholesale service profitability is generally prepared on a CCA FAC basis. A charge control based on CCA FAC data can be reconciled more easily to BT's RFS, which are audited and are in the public domain;
- there are practicality issues associated with an LRIC+EPMU approach that would involve reviewing BT's LRIC estimates for individual services and ensuring that they provide an appropriate basis for allocating common costs; and
- a LRIC+EPMU approach requires that common costs are allocated in proportion to the LRIC costs of each service, whereas CCA FAC is based on BT's methodology for allocating common costs. As noted earlier, we consider that there can be benefits in allowing BT to determine the most appropriate way to

¹³⁷ TalkTalk response to the June LLCC Consultation, paragraph 8.43

¹³⁸ Paragraphs 3.14-3.39, Volume 2, June 2014 FAMR Statement and paragraphs 7.117-7.122, June 2014 WBA Statement.

recover common costs, provided we have taken into account the risks identified above.

- 5.90 Based on these arguments, we have decided to use CCA FAC as our cost standard for setting the controls in this statement.¹³⁹

The treatment of costs that are common between BT's regulated and non-regulated services

- 5.91 The CCA FAC cost standard involves allocating all of BT's costs to its services. BT's financial reporting system that generates its CCA FAC information does not identify and specifically allocate different types of common costs, as would be the case under a LRIC+EPMU approach. However, underlying BT's cost structure are incremental and common costs.
- 5.92 As we set out in Annex 28 regarding our CAR general overheads treatment, we have reduced the share of common costs that BT recovers from regulated markets. However, we still consider it appropriate for BT to recover a proportion of its common costs through regulated products. We consider that our approach balances the interests of consumers and of upstream and downstream competitors to BT.
- 5.93 In a market where the upstream provider did not have any other operations, we would expect the cost of the upstream product would be at least standalone cost (SAC). Given BT's economies of scale and scope, we would expect that this SAC would be at least the same, if not higher, than the portion of IGCCs that we have included when calculating Openreach's costs. Consequently, it would seem in the interests of consumers to take into account BT's economies of scope in determining the appropriate amount of these costs to recover in regulated services, as the level of non-incremental costs payable in regulated services is unlikely to be higher than those that would be paid to a stand-alone upstream provider, and may in fact be lower.
- 5.94 Having decided to take into account economies of scope by taking into account that BT's non-incremental costs can be recovered between a number of services, we then need to determine the appropriate balance of cost recovery between upstream and downstream services.
- 5.95 We note that TalkTalk's main argument is less about the overall level of common costs to be recovered (which would directly affect consumers), but instead the balance of their recovery between upstream and downstream markets. We agree with TalkTalk that excluding IGCCs from regulated products would lead to a reduction in efficiency in upstream markets as efficient entry by upstream only competitors outside the CLA would be reduced. However, we disagree with TalkTalk that this would be only a small distortion; we consider setting a price consistent with efficient upstream entry and investment signals to be a critical regulatory objective. Although some competitors such as Virgin, Vodafone and Colt may be active both upstream and downstream, allocating no IGCCs to upstream markets risks distorting efficient build/buy decisions.
- 5.96 We disagree with TalkTalk that our current approach to allocating common costs "distorts 'on the merits' competition in downstream markets".¹⁴⁰ Under our approach, only part of BT's IGCCs are allocated to regulated services, and by taking account of

¹³⁹ With the RAV adjustment to pre-1997 copper and duct assets as set out in Annex 27.

¹⁴⁰ TalkTalk response to the June 2015 LLCC Consultation, paragraph 8.43

BT's economies of scale and scope we are including a lower proportion than under an SAC approach. Like other CPs, BT downstream will also have to recover the common costs associated with its downstream operations.

- 5.97 We also continue to consider that TalkTalk's approach could lead to inefficient downstream entry as other CPs would be able to compete with BT Wholesale despite having costs that exceed BT Wholesale's costs because BT Wholesale would also have to incorporate some of Openreach's portion of common costs in its charges. As with our choice to base our cost forecasts on BT's costs, we encourage competition to arise where other operators are of comparable efficiency to BT in providing those services. We therefore consider that our decision is consistent with the principle of competition on its merits in the downstream market. In this respect we also note that other downstream CPs, such as Vodafone, Colt, Virgin and Sky, are also often able to recover part of their non-incremental costs from other business areas, such that the risk of inefficient exclusion is likely to be low.
- 5.98 TalkTalk suggests that, by including any allocation of common costs in regulated services, Ofcom's logic amounts to "*avoiding the risk of inefficient entry (only)*", and that "*the natural consequence of [this logic] would be to set an ever higher (and above FAC) wholesale price to limit any entry*".¹⁴¹ Our analysis considers both the risks of inefficient entry and the risks of inefficient exclusion. As we outlined in our June 2015 LLCC Consultation, we generally have regard to both dynamic and static efficiency and do not seek to achieve one solely at the expense of the other. We consider that our decision, in assigning an appropriate allocation of common costs to regulated leased line products, strikes the right balance.¹⁴²

We have adopted an MEA approach for certain legacy Ethernet services

- 5.99 In Section 4, we set out our approach to determining the technology used in the 2016 LLCC Model as a reference to set charges. In this sub-section, we apply this framework to the services in the Ethernet basket by addressing the following questions:
- can we identify the MEA for delivering the service in question?;
 - can we calculate robust cost estimates for the services based on the MEA?;
 - would the use of the MEA allow an efficient operator the opportunity to recover its costs?; and
 - does the MEA give appropriate migration signals to consumers?
- 5.100 In what follows we first consider the changes in the technology used by Openreach to provide Ethernet services that have occurred in recent years, we then set out our proposals in the June 2015 LLCC Consultation, responses to that consultation, and finally we present our current decisions for this charge control period.

Background

¹⁴¹ TalkTalk response to the June 2015 LLCC Consultation, paragraph 8.45

¹⁴² Given that distortion in both the upstream and downstream markets would be increased under TalkTalk's approach, we do not consider the ability of upstream providers to enter downstream markets to be of relevance.

Ethernet technology changes

- 5.101 The technology to provide dedicated Ethernet on fibre or wavelengths has been around for many years. Openreach started introducing Ethernet products in 2000 starting with LAN Extension Service (LES). Then Openreach introduced WES, Wholesale end-to-end Extension Service (WEES) and Backhaul Extension Service (BES). In 2008 Openreach introduced EAD and Ethernet Backhaul Direct (EBD).
- 5.102 Openreach's current portfolio for Ethernet services at and below 1Gbit/s includes WES/WEES/BES, EAD and EBD.¹⁴³ Openreach has encouraged a sizeable proportion of customers using various legacy technologies up to and including 1Gbit/s to migrate to EAD services.¹⁴⁴ Further, it also withdrew certain bandwidths of WES/WEES and BES circuits from new supply in June 2011; only EAD services are now available for new supply at these speeds.

June 2015 LLCC Consultation

- 5.103 In the March 2013 BCMR Statement, we identified EAD as the MEA for Ethernet services up to 1Gbit/s and modelled WES, WEES, and BES as having the same costs as the equivalent EAD circuit. In our June Consultation, we considered that the broad reasoning we set out in the March 2013 BCMR statement remains valid for the forthcoming charge control period.
- 5.104 Our views in the June Consultation can be summarised as follows:
- we continued to believe that EAD services can be identified as the MEA for delivering the legacy WES/WEES/BES services at or below 1Gbit/s;
 - we had sufficient regulatory financial reporting information upon which to calculate robust cost estimates for EAD at or below 1Gbit/s. As an established portfolio of services, BT has published detailed cost information on EAD services at or below 1Gbit/s for a number of years;¹⁴⁵
 - we remained of the view that the use of anchor pricing for the legacy Ethernet services at or below 1Gbit/s in the July 2009 LLCC Statement, in conjunction with our treatment of transition costs in the March 2013 BCMR Statement, means that the use of the MEA approach for Ethernet services below 1Gbit/s is consistent with Openreach having an opportunity to recover its efficiently incurred costs; and
 - we continued to consider that the MEA approach, in conjunction with our basket design proposals set out below and the transition cost adjustment provided in the March 2013 BCMR Statement, is consistent with allowing Openreach to give appropriate migration signals to customers. Indeed, over the current control period Openreach has continued to successfully migrate customers from the legacy Ethernet services to the newer EAD services. In 2013/14, the total number

¹⁴³ When discussing the choice of technology, we use EAD to refer to all variants of the EAD product (including EAD LA, EAD Extended Reach, EAD Enable etc.).

¹⁴⁴ For example, Openreach has offered reductions on EAD connection fees for CPs migrating from legacy Ethernet products; Openreach, *Price List, WES/WEES – EAD migration offer*, <https://www.openreach.co.uk/orpg/home/products/ethernet-services/legacymigrations/specialmigrationconnectionoffer/specialmigrationconnectionoffer.do>

¹⁴⁵ BT has published detailed cost information on EAD services at or below 1Gbit/s since 2010/11.

of WES circuits fell by just over 20% while the number of BES circuits fell by around 15%. By 2018/19, they are forecast to decline by [3<] respectively.

- 5.105 In the March 2013 BCMR Statement, we considered whether we needed to take into account holding losses or transition costs associated with the transition to new Ethernet services to give Openreach the opportunity to recover its efficiently incurred costs. Based on information provided by Openreach, we did not consider that there were holding losses arising from adopting the MEA approach.¹⁴⁶ But we did take into account a transition cost adjustment which allowed Openreach to recover the costs of installing new EAD circuits to replace the legacy WES and BES circuits. As we allowed for these transition costs in full in the 2013 LLCC, we proposed not to allow BT any allowance for transition costs for the upcoming control period.

Stakeholders' comments

- 5.106 GTC and [3<] agreed with our proposal.¹⁴⁷ No other stakeholders commented on Ofcom's MEA approach.¹⁴⁸

Our conclusions

We have used a MEA approach for Ethernet services at or below 1Gbit/s

- 5.107 We consider that the broad reasoning we set out in the June Consultation, and summarised above, remains valid for the forthcoming charge control period.
- 5.108 We therefore have decided to adopt the same MEA approach for Ethernet services up to and including 1Gbit/s as we proposed in our June Consultation and as we adopted in the March 2013 BCMR Statement.¹⁴⁹ However, as set out above, we have decided not to allow for transition costs in this charge control period as we allowed for these costs in full in the previous charge control.¹⁵⁰ We see no reason why a further allowance is required in this control period, consistent with our view in the March 2013 BCMR Statement, where we explained that the transition cost adjustment was limited to that charge control and is not a policy that we proposed to extend indefinitely.¹⁵¹

¹⁴⁶ For example, see Ofcom, *Business Connectivity Market Review, Review of retail leased lines, wholesale symmetric broadband origination and wholesale trunk segments, Statement*, 28 March 2013, paragraphs 20.223-20.228, <http://stakeholders.ofcom.org.uk/consultations/business-connectivity-mr/?a=0>. We note that for WES and BES services provided prior to 2010/11, the equipment and installation costs were allocated to connections. However, Openreach explained that those Ethernet services use more fibre than EAD, and so the adoption of the MEA approach means that fewer fibre costs can be recovered. We considered that this does not constitute a holding loss, as the fibre costs are common with other services (including EAD) and would be reallocated and recovered from other services, rather than written-off.

¹⁴⁷ GTC response to the June 2015 LLCC Consultation, page 4.

¹⁴⁸ BT response to the June 2015 LLCC Consultation, paragraph 168; Virgin response to the June 2015 LLCC Consultation, page 6.

¹⁴⁹ We set out in Annex 26 the details of the mapping from legacy WES/WEES and BES services to EAD services we have adopted in our charge control model.

¹⁵⁰ We discussed this in more detail in our June LLCC consultation, paragraphs 6.40 – 6.43

¹⁵¹ Paragraphs 20.154 and 20.213, March 2013 BCMR Statement.

The financial year 2014/15 is the base year in the 2016 LLCC Model

June 2015 LLCC Consultation

5.109 In the June 2015 LLCC Consultation we proposed to use the financial year 2014/15 and BT's 2014/15 RFS as a base year for the 2016 LLCC Model.

Stakeholders' comments

5.110 BT, Virgin and Vodafone agreed with our proposal.¹⁵²

5.111 Other stakeholders did not raise any concerns in relation to our proposal.

Our conclusions

5.112 We have decided that the base year for the 2016 LLCC Model is the financial year 2014/15. We are using BT's 2014/15 RFS data as they are the most recent fully audited regulatory financial statements presently available to us in developing our conclusions. BT's RFS are subject to independent audit and are supplemented by extensive documentation that explains that basis of preparation.

We have made adjustments to BT's 2014/15 RFS

June and November 2015 LLCC Consultation

5.113 We proposed adjustments to BT's RFS to form our base year costs.

Stakeholders' comments

5.114 A number of stakeholders provided substantial responses to our proposed base year cost adjustments. Although most of the respondents agreed in principle that BT's RFS need to be adjusted, their comments were conflicting as to the level of these adjustments. In particular, we received a number of responses to our proposals related to the Cost Attribution Review, Quality of Service and Service Level Guarantee payments.

5.115 We set out the responses in detail in Annexes 27 and 28 and the section below sets out a more detailed discussion of the responses relating to our decision to allow BT to recover its efficiently incurred QoS costs.

Our conclusions

5.116 Our starting position for the base year costs is based on BT's audited RFS for 2014/15. Openreach has also provided us with a detailed disaggregation of costs from the RFS.

5.117 We have scrutinised the base year data provided by BT following a set of criteria as identified in Annex 27. First, we have established that BT has adopted our proposed adjustments in relation to Access Cards, June 2015 CAR Errors, RAV, Cumulo¹⁵³

¹⁵² BT response to the June 2015 LLCC Consultation, paragraph 84; Virgin response to the June 2015 LLCC Consultation, page 5; Vodafone response to the June 2015 LLCC Consultation, page 49.

¹⁵³ BT has not strictly followed our requirements in relation to Cumulo as set out in the March 2015

and TI Volumes. Therefore, it has not been necessary to make any further adjustments in relation to these costs as they are already reflected in the 2014/15 RFS. Second, we have identified the need to make the following adjustments to the 2014/15 base year data, as set out in Annexes 27 and 28:

- **Error in 2014/15 RFS:** We have removed the costs relating to BT's error in the accounting of Project Services and CPE Switch;
- **EE Acquisition costs:** We have removed the costs relating to BT's acquisition of EE;
- **Transmission Equipment:** We have removed the costs of transmission equipment that have already been recovered through connection charges prior to 2010/11;¹⁵⁴
- **Base year adjustments informed by CAR:** We have made adjustments to reflect that analysis¹⁵⁵;
- **Restructuring costs:** We have smoothed the costs relating to one-off restructuring charges;
- **Property Rationalisation provision:** We have smoothed the costs relating to Property Rationalisation provision;
- **QoS resource uplift:** We have included additional resource costs associated with required improvements to BT's QoS; and
- **SLG payments:** We have reduced the level of SLG payments to reflect expected improvements in QoS over the control period.

5.118 Table 5.2 below is a summary of the impact of our adjustments on the reported 2014/15 data.

Table 5.2: Summary of adjustments made to Ethernet base year costs

Adjustment	Impact on Ethernet services FAC (£'m)
2014/15 RFS Total	548.8
Error in 2014/15 RFS	(6.4)
EE Acquisition costs	

Directions Statement. As a result the Cumulo costs in the base year data have been understated with [X] in the Ethernet basket and overstated with [X] in the TI basket. Given that this impact is not significant, we have decided not to make any further adjustment in the 2016 Base Year Model related to Cumulo.

¹⁵⁴ This relates to the removal of Ethernet transmission equipment deployed. Prior to 2010/11 BT recovered these costs through connection charges. BT changed its RFS treatment in 2010/11 to recover the cost of equipment through rental charges. It capitalised the cost of pre 2010/11 equipment which we excluded from our cost base in the March 2013 BCMR Statement to prevent double recovery of costs.

¹⁵⁵ We have made adjustments to costs relating to: Fibre costs, Duct costs, Openreach and TSO Software costs, Electricity costs, Property costs and General Overheads.

	(1.8)
Transmission Equipment costs	(2.1)
Adjustments informed by the analysis in Cost Attribution Review ¹⁵⁶	(45.1)
Restructuring costs	(1.1)
Property Rationalisation provision	(0.7)
QoS resource uplift	16.7
SLG Payments	(4.7)
2014/15 Revised Total	503.5

Source: Ofcom

We have taken the need for BT to make improvements to QoS into account in forecasting costs

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5.119 We proposed that BT should be allowed to recover an efficient level of QoS costs from the proposed charge controls. When forecasting costs we therefore proposed to take into account BT's additional resource costs associated with improving its QoS. To do so we proposed to apply a QoS resource uplift to reflect the additional staff that BT planned to recruit (QoS Improvement Programme). In view of required improvements to BT's QoS we also proposed a SLG payments adjustment to the base year cost data.

Stakeholders' comments

5.120 In its response to the June 2015 LLCC Consultation, BT agreed that it should be allowed to recover its efficiently incurred resource costs associated with improving its quality of service. However, it disagreed with how the cost adjustment has been applied in the 2015 LLCC Model to allow recovery of these costs and provided comments in relation to its QoS Improvement Programme.¹⁵⁷

5.121 BT also agreed that it should be allowed to recover an efficient level of incurred SLG payments. It proposed that Ofcom should allow a mechanism to update the view of allowable costs in light of the current industry negotiations on changes to the SLA and SLG regime.¹⁵⁸

5.122 Virgin agreed with the proposed QoS resource uplift. According to Virgin, it would be inappropriate to act retrospectively in relation to BT's previous resource costs. Setting such a precedent would lead to regulatory uncertainty and would send

¹⁵⁶ See Annex 28.

¹⁵⁷ BT response to the June 2015 LLCC Consultation, paragraphs 186-191.

¹⁵⁸ BT response to the June 2015 LLCC Consultation, paragraphs 184-185.

potentially misleading incentive signals to the market during the forthcoming price control period. Virgin also agreed with the proposed adjustment to SLG payments.¹⁵⁹

- 5.123 Sky disagreed with the proposed QoS resource uplift. It said that it is very likely that Openreach could make service quality improvements and meet its SLAs through efficiency improvements, without the need for additional resources. According to Sky, the QoS resource uplift provides limited or no incentives on Openreach to improve service quality through efficiency gains.¹⁶⁰
- 5.124 UKCTA also disagreed with the proposed QoS adjustment. It said that Ofcom's proposed QoS resource uplift would result in OCPs contributing an unreasonable proportion of the required funding to rectify the QoS deficit and argued that the QoS resource uplift should be removed from the base year costs. It also said that SLG payments should be treated as inefficient operation on BT's part and should be excluded from the base year costs.¹⁶¹
- 5.125 Vodafone said that BT had been removing or reallocating resources under the guise of efficiency savings which resulted in extra profitability. It argued, therefore, that Ofcom should not allow a resource uplift in order for BT to normalise its quality of service levels. Vodafone said that Ofcom should at the very least recognise that BT had not managed their labour resources in an efficient way, and introduce an adjustment to strip out the additional costs of recruitment and extra costs of sub-contracted labour, taking account of the productivity gap that has emerged due to new staff being deployed and trained or non-BT labour having to be deployed in the field.¹⁶²
- 5.126 [3<] disagreed with the addition of costs regarding quality of service. It said that Ofcom's approach allows BT to deliver poor service for a period before a market review and then be rewarded for it by being allowed to recover the costs of compliance from its customers.¹⁶³
- 5.127 We summarise stakeholders' comments on the level of the QoS cost uplift in Annex 27.

Our conclusions

- 5.128 As we set out in Section 13, Volume I, we have undertaken a review of the service quality that BT delivers in the supply of regulated wholesale Ethernet services.¹⁶⁴
- 5.129 In setting the charge control we seek to close the gap between the charges for regulated services and the (forecast) efficient costs of providing those services. The efficient costs of providing a service usually depend on the quality of that service. We would normally expect lower levels of service quality to be associated with lower

¹⁵⁹ Virgin response to the June 2015 LLCC Consultation, page 7.

¹⁶⁰ Sky response to the June 2015 LLCC Consultation, paragraphs 10.20-10.23.

¹⁶¹ UKCTA response to the June 2015 LLCC Consultation, paragraphs 2.15-2.17.

¹⁶² Vodafone response to the June 2015 LLCC Consultation, paragraphs 3.30-3.36.

¹⁶³ [3<] response to the June 2015 LLCC Consultation, page 19.

¹⁶⁴ Our work for the statement is also linked to a wider review of BT's QoS which is supported by the OTA2 with the cooperation of industry. The OTA2 is facilitating discussions between BT and its customers in the provision of Ethernet services. This work has identified the need for and is proposing and agreeing changes in customer management processes employed by BT. It has also identified the need for changes to the way in which CPs work with BT to arrange the delivery of new services.

costs of provision and vice versa for higher levels of service quality. However, where the firm needs to pay penalty payments to its customers for lower service quality levels than contractually agreed, as is the case with BT, the relationship between service quality and cost may be more complex.

- 5.130 Reflecting this interaction between service quality and costs, charge controls are imposed in the context of an assumed baseline QoS standard. This can often be on the basis of an implied assumption that the existing level of quality is maintained. For this charge control we do not consider it appropriate to assume that BT's current level of service quality will continue through the charge control period given the changes BT is seeking to make to address stakeholder concerns, and the SMP remedies that we are imposing in this statement. Below we set out the changes we have made to our forecasts of BT's efficiently incurred costs over the control period.

BT's QoS costs include both resource costs and penalty payment costs

- 5.131 The terms upon which BT provides services to its business connectivity customers are set out within the contracts it holds with its customers. A SLA forms part of these contracts. The SLA sets out BT's commitments to provide the services to an agreed level of quality and within a specified period of time.

- 5.132 Reflecting this contractual arrangement, BT's costs associated with QoS for wholesale Ethernet services could be viewed as comprising two main elements:

- **resource costs:** in order to deliver a particular level of service quality BT needs to deploy a certain level of resources. These resources can include both capital and labour. The use of these resources for delivering business connectivity services gives rise to costs. As set out above, we would normally expect higher levels of service quality to require greater resource commitments; and
- **penalty costs:** if BT fails to deliver its services to the standard set out in the SLAs, e.g. if the service was late, its customers are entitled to penalty payments (SLG payments).

- 5.133 We use the term QoS costs to mean the sum of resource costs and SLG payments.

BT should be allowed to recover its efficiently incurred QoS costs from the charge control

- 5.134 One of our charge control objectives is that BT should have the opportunity to recover its efficiently incurred costs.

- 5.135 In relation to resource costs, we would not expect BT to meet its commitments to provide wholesale Ethernet services to an agreed quality and, in particular, to an agreed provisioning and fault repair standard, unless it maintains an efficient level of expenditure, i.e. both capital expenditure and operating expenditure, involved in meeting these standards. Therefore, we expect BT to be employing as many engineers as it is efficient for it to meet its contracted provisioning and repair lead times.

- 5.136 In relation to SLG payments, we disagree with UKCTA that SLG payments should be treated as inefficient operation on BT's part and should be excluded from the base year costs. We would not expect an efficient firm to be resourced up to a level such that it would never have to make such payments. The resource commitments required to ensure that SLAs are always met are likely to be very significant and

involve QoS costs that would unlikely be at an efficient level. Allowing the recovery of some SLG payments through charges is likely to be consistent with allowing BT the opportunity to recover its efficiently incurred costs.

- 5.137 The inclusion of QoS costs within the charge control provides BT with the incentive to improve its performance against the SLAs and reduce its costs. Therefore we believe that our decision is consistent with giving BT appropriate incentives to invest and minimise costs.

BT's QoS Improvement Programme

- 5.138 As part of our examination of BT's quality of wholesale Ethernet services, in Section 13, Volume I we have imposed a number of remedies, including minimum standards against which BT will be required to deliver key provisioning and fault repair.
- 5.139 Before the June 2015 LLCC Consultation, BT informed us of an additional investment of [X] additional staff to improve the quality of its services (QoS Improvement Programme). Since then, BT has clarified that the resources it had originally planned to recruit in 2014/15 were only partially recruited in 2014/15 ([X]) with the remainder ([X]) plus a small additional number of staff ([X]) recruited in 2015/16.¹⁶⁵

We have made adjustments to allow BT to recover the costs associated with its QoS Improvement Programme

- 5.140 As set out above, when setting charge controls we seek to allow BT the opportunity to recover its efficiently incurred costs, including those required to improve service quality where such an improvement is appropriate.
- 5.141 In Section 13, Volume I we note that, for the period from 2011 to 2015, the increase in volumes for Ethernet was not matched by a proportionate increase in the resources available to undertake Ethernet related work, i.e., the level of resources did not keep pace with demand.¹⁶⁶ This suggests that, without an upward adjustment, the level of costs included in our base year would not reflect an adequate quality of service, particularly now that we have introduced minimum service standards which require BT to improve its quality of service. We have therefore decided that it is appropriate to allow BT to recover additional resource costs associated with improving the quality of Ethernet services.
- 5.142 It is difficult to precisely estimate the efficient level of resource which BT requires in order to achieve our minimum standards for QoS. The relationship between demand and resource is not straightforward, particularly in light of the complexity of Openreach's provision process queuing systems. We are also wary of the inefficiency associated with allocating additional costs when we are unable to verify if these are required. Therefore, in our decision on whether to allow BT to recover costs associated with improving its QoS, we have focused on where BT can demonstrate that the resources are necessary for Ethernet services and where we have confidence that the costs have already been or will be incurred.
- 5.143 We have decided to allow BT to recover from the charge control the costs of its QoS Improvement Programme, as consulted on in the June 2015 LLCC Consultation.

¹⁶⁵ BT response dated 27 January 2016 to question A2 of the 34th s135 notice dated 20 January 2016; and BT response dated 15 March 2016 to Section B of the 35th s135 notice dated 10 March 2016.

¹⁶⁶ Section 13, Volume I.

Although some of these costs were not incurred in 2014/15, the remainder of the costs we have allowed were incurred in 2015/16. We believe this is appropriate given that this programme has already been implemented and BT has been able to demonstrate how these costs have been spent.

- 5.144 Given that we have based our statement on BT's RFS data for 2014/15, some of the costs associated with BT's QoS Improvement Programme are captured in our base year data. In particular we capture the cost for 2014/15 of the additional employees recruited in that year. However, this does not include the cost of the additional employees recruited in 2015/16 or the impact of capitalisation as an annual cost for the period of the charge control. Therefore, in order to take into account the full cost of the QoS Improvement Programme, there needs to be a corresponding adjustment upwards.
- 5.145 We now estimate that the QoS resource uplift should be £16.7m (as opposed to the £4.1m we consulted on). This is because we now treat these costs as a recurring annual cost throughout the duration of the charge control period. We set out the assumptions and adjustments we have made in order to appropriately reflect the full amount of these costs in the 2014/15 base year in Annex 27.
- 5.146 In response to Sky, Vodafone, UKCTA and [X], we disagree that it is inappropriate to allow BT to recover the costs it requires to improve service quality during the 2016 LLCC period (i.e. the QoS Improvement Programme). Excluding such costs from the cost base would result in BT under-recovering some of its efficiently incurred costs over the control period. This would be inconsistent with our principle of ensuring that charge controls give BT an opportunity to recover its efficiently incurred costs and our objective of setting the charge control such that BT recovers its WACC in 2018/19.
- 5.147 In our view, a departure from our approach to forecasting BT's efficiently incurred costs over the control period in order to correct for historical profitability, would amount to retrospection, which we consider to be contrary to regulatory best practice given its impact on regulatory certainty.
- 5.148 While in hindsight it could be argued that additional constraints on BT's incentives and ability to engage in cost reductions that act to lower service quality may have been appropriate during the past control period, we consider the appropriate response is not to retrospectively seek to correct for this, but rather to ensure that appropriate remedies are in place going forward. In Volume I of the statement we set out SMP remedies that seek to directly restrict BT's incentives, and ability to act on any such incentives, to undertake actions that result in a degradation of the quality of its Ethernet service in the next control period.
- 5.149 We disagree with Sky that the QoS resource uplift provides limited or no incentives for Openreach to improve service quality through efficiency gains. As discussed below and in Annex 29, we have applied an efficiency factor to Ethernet capex and opex which requires BT to improve the provision of its services, including the improvement of its service quality, through efficiency gains.¹⁶⁷ We are also making a SCA to address excess returns, removing scope for BT to use these to fund the improvement in QoS.

¹⁶⁷ We have also ensured that the QoS resource uplift has not been taken into account again when calculating BT's capex efficiency target.

We have rejected BT's Additional QoS Cost Request

- 5.150 In a supplementary response to the November 2015 LLCC Consultation, BT set out its estimates for additional QoS costs it believed necessary in order to further improve the quality of its Ethernet services in view of our proposed QoS standards ("Additional QoS Cost Request"). In summary, BT requested an additional £49.3m of cash expenditure for additional resource to handle order volatility and for three additional QoS work streams: transformation of systems and processes, third party management, and evolving exiting resources.¹⁶⁸
- 5.151 We do not consider it appropriate to allow these resources to be recovered from the charge control. Firstly, BT has not provided clear and complete information to enable us to verify that these additional resources are required over and above its QoS Improvement Programme (that we are allowing for in the charge control) and various other improvements that are being developed or already in place.¹⁶⁹
- 5.152 Secondly, we do not consider that BT has adequately justified that these resources are necessary and appropriate in order for BT to meet our minimum service levels and that they represent an efficient level of QoS expenditure. We note in particular that around [3%] of BT's Additional QoS Cost Request relates to additional resource for handling monthly order volatility. Given that BT is required to comply with the minimum service levels on an annual basis, we do not consider that it would be necessary to staff to such an extent to meet this volatility in demand.
- 5.153 Finally, at the time of BT's submission to Ofcom, BT's plans for these resources had not been subject to formal internal approval within BT and were only to be considered in March 2016. There is therefore uncertainty as to whether these plans will translate into an actual investment decision by BT and whether the costs associated with these additional resources will be incurred.
- 5.154 In Section 13, Volume I, we discuss the impact of the minimum standards on Openreach's resource levels and conclude that, on the basis that we have decided to allow the costs of Openreach's QoS Improvement Programme in the 2016 LLCC, Openreach has not sufficiently substantiated that this level of resource is insufficient for it to meet our minimum standard performance levels.

We have decided to make an adjustment to allow BT to recover a proportion of SLG payments consistent with our minimum QoS standard

- 5.155 As we set out above, allowing BT to recover at least a proportion of its SLG payments is likely to be consistent with allowing it to recover its efficiently incurred QoS costs. However, we consider the SLG payments in 2014/15 are unlikely to represent an appropriate level of SLG costs for modelling purposes. This is for two reasons. First, BT's payments for SLGs in 2014/15 are likely to exceed the efficient level, given BT's poor QoS performance during this period. Second, given BT's QoS Improvement Programme, we are expecting its QoS to improve over the period of the control and therefore its SLG payments should reduce relative to 2014/15.
- 5.156 Given that a new SLG regime is currently being negotiated by industry, there is uncertainty around the level of SLG payments over the period of this charge control.

¹⁶⁸ BT supplementary response to the November 2015 LLCC Consultation.

¹⁶⁹ For example BT's Differentiated Order Journey (DOJ) programme (including the introduction of DOJ) and associated EMP system development.

Therefore, we need to exercise regulatory judgement in estimating the level of SLG payments to include in the base year costs.

- 5.157 We consider that the best proxy for this is the level of SLG payments which BT incurred in 2011. As noted in Section 13, Volume I, we have used BT's faster lead time performance for provisioning of Ethernet services in 2011 to inform the final minimum standard for improved lead time performance. Using a level of SLG payments consistent with those incurred in 2011 to adjust BT's costs, represents a reasonable level of SLG payments that should be included in the base year costs, given the improvements BT will make to meet our minimum QoS standards. Further we note that in the 2013 LLCC, we reviewed BT's SLG payments for 2011/12 (which was the base year for that control) and determined that we did not have evidence that these were excessive.¹⁷⁰
- 5.158 Given that BT's QoS performance in 2014/15 was significantly below that achieved in 2011, this adjustment involves removing a significant proportion ($\frac{1}{3}$ %) of BT's incurred SLG payments from the base year cost data. We also note that by including SLG payments in the base year costs we ensure that these costs reflect the change in volume growth during the charge control period.
- 5.159 We set out the adjustment that we have made in relation to BT's SLG payments in the 2014/15 base year in Annex 27.

Stage 3: Forecast costs for the duration of the charge control

- 5.160 Having modelled the relevant base year costs under Stage 2, we forecast (from this starting point) how costs are likely to change over the duration of the charge control. In the paragraphs below we summarise our decisions in relation to volume and efficiency changes, AVEs and CVEs, input price inflation changes and the cost of capital and the impact of imposing other remedies given that they are specific to Ethernet services.

We have forecast significant Ethernet volume growth until 2018/19

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- 5.161 We proposed to forecast significant Ethernet volume growth until 2018/19. We considered that the volumes for 10Mbit/s services will continue to decline and that volumes for services of 100Mbit/s and above will continue to grow.
- 5.162 We said that we expect the proposed dark fibre to cannibalise some active circuits forecast in the next review period. Therefore, we forecasted dark fibre take-up and proposed:
- 50% cannibalisation of new connections (and associated rentals) for EAD, EAD LA and OSA circuits at 1Gbit/s and above in the second year of the control (the first year that the dark fibre remedy will be commercially available);
 - 100% cannibalisation of new connections (and associated rentals) for EAD, EAD LA, and OSA circuits at 1Gbit/s and above in the final year of the control (in other words, we assume no new active connections for these circuits); and

¹⁷⁰ March 2013 BCMR Statement, paragraph 18.50.

- no cannibalisation of existing active circuits.

Stakeholders' comments

- 5.163 BT agreed with Ofcom's forecasts for Ethernet volumes. It said that Ofcom has adopted a top-down approach to volume forecasting which is credible and as cited consistent with BT's approach and those adopted by other CPs and industry analysts.¹⁷¹
- 5.164 Vodafone suggested that actual Ethernet volume growth could be up to 15% higher than Ofcom's forecast based on declining prices, growing demand for bandwidth and lack of business grade alternatives. Vodafone however noted that such volume growth is not certain and therefore suggested that Ofcom put in place an error correction mechanism.¹⁷²¹⁷³
- 5.165 We received different views from stakeholders with regards to our proposed cannibalisation assumptions. Some stakeholders (e.g. Sky¹⁷⁴, GTC¹⁷⁵, and Vodafone¹⁷⁶) argued that our cannibalisation assumptions for new connections were an overestimate, whilst BT¹⁷⁷ has argued that there will be greater cannibalisation. Furthermore we have received mixed responses from stakeholders regarding the speed of dark fibre take-up. We have summarised stakeholder comments with regards to dark fibre volume forecasts in Annex 33.

Our conclusions

- 5.166 As we are forecasting the costs and revenues of BT's Ethernet leased lines, our volume forecasts only include BT's sales and not, for example, market-wide volumes. Furthermore, BT's Ethernet leased lines consist of a significant number of different products (e.g. EAD, EAD LA, WES, BES, etc.), bandwidths and charging elements (for example rentals, connections and main links). The 2016 LLCC Model requires forecasts for each product and charging element, including those that are outside our charge control; for example, Ethernet and WDM services above 1Gbit/s and all Ethernet services in the CLA.¹⁷⁸ This is because the costs for controlled services may also depend on the demand for non-controlled services due to the presence of economies of scale and scope in the provision of leased lines. Furthermore, non-controlled services are also relevant in terms of controlling the impact of our dark fibre remedy.
- 5.167 We have followed two steps to establish our volume forecasts for Ethernet services. We start by establishing a forecast for actives-only circuits, drawing on volume forecast information from different stakeholders and industry analysts gathered since

¹⁷¹ BT response to June 2015 LLCC Consultation, paragraphs 195-200.

¹⁷² Vodafone response to the June 2015 LLCC Consultation, paragraphs 4.43-4.45.

¹⁷³ Vodafone first raised this point in an earlier submission (Vodafone, *Consequences of Charge Control Baskets*, February 2015, http://stakeholders.ofcom.org.uk/binaries/telecoms/market-reviews/LLCC/Consequences_of_charge_control_baskets_Vodafone_February_2015.pdf). We responded to Vodafone's points in Annex 13 of our June 2015 LLCC Consultation. Vodafone did not address our comments.

¹⁷⁴ See Sky's non-confidential response to the June 2015 LLCC Consultation, paragraphs 8.26-8.27 and 10.16.

¹⁷⁵ See GTC's non-confidential response to the June 2015 LLCC Consultation, pages 3 to 5.

¹⁷⁶ See Vodafone's non-confidential response to the June 2015 LLCC Consultation, paragraph 4.42.

¹⁷⁷ See BT's non-confidential response to the June 2015 LLCC Consultation, pages 42 and 43.

¹⁷⁸ We explain how we have dealt with volumes in the CLA in Annex 26.

the June 2015 Consultation. We then consider how this demand may be affected by the availability of the dark fibre remedy. Based on these two inputs, we derive our forecasts of demand for active services in the presence of the dark fibre remedy. Below we discuss each of these steps.

Actives-only forecast

- 5.168 We have gathered volume forecasts, in the absence of passive remedies, for Ethernet and Optical services for the charge control period from BT as well as OCPs and two industry analysts. Some of the trends are fairly consistent, for example for 100Mbit/s services, but we have found some differences between BT's forecasts and those of other CPs and/or industry analysts. In particular, [3<].
- 5.169 In terms of 10Mbit/s services, we consider that volumes will continue to rapidly decline due to Openreach's current pricing of EAD and EAD LA 10Mbit/s circuits, which are charged at a higher rate than their equivalent 100Mbit/s services. We therefore expect customers of 10Mbit/s services to continue upgrading to 100Mbit/s circuits, as they did in 2014/15. Furthermore, as set out in Section 3, Ethernet in the First Mile (EFM) services are emerging as an alternative for users that do not necessarily need very fast upload and download speeds, while NGA may be an alternative for users who also do not need other features of leased lines.¹⁷⁹
- 5.170 We have therefore considered all forecasts and in particular have placed weight on BT's forecasts for the reasons set out in Annex 32. We predict continued growth in demand for Ethernet services of 100Mbit/s and above, which is likely to be driven by the following factors:
- increasing demand for bandwidth-intensive activities and applications;
 - the need to transmit increasingly large amounts of data quickly;
 - the deployment of NGA and new services delivered over 4G mobile networks which will further increase the requirement for backhaul capacity; and
 - the lower unit cost of Ethernet by bandwidth is likely to drive further significant growth in the demand for Ethernet services.
- 5.171 Our forecast of Ethernet circuit volumes, as summarised in Figure 5.1 below, shows that a significant growth is expected between 2014/15 and 2018/19.

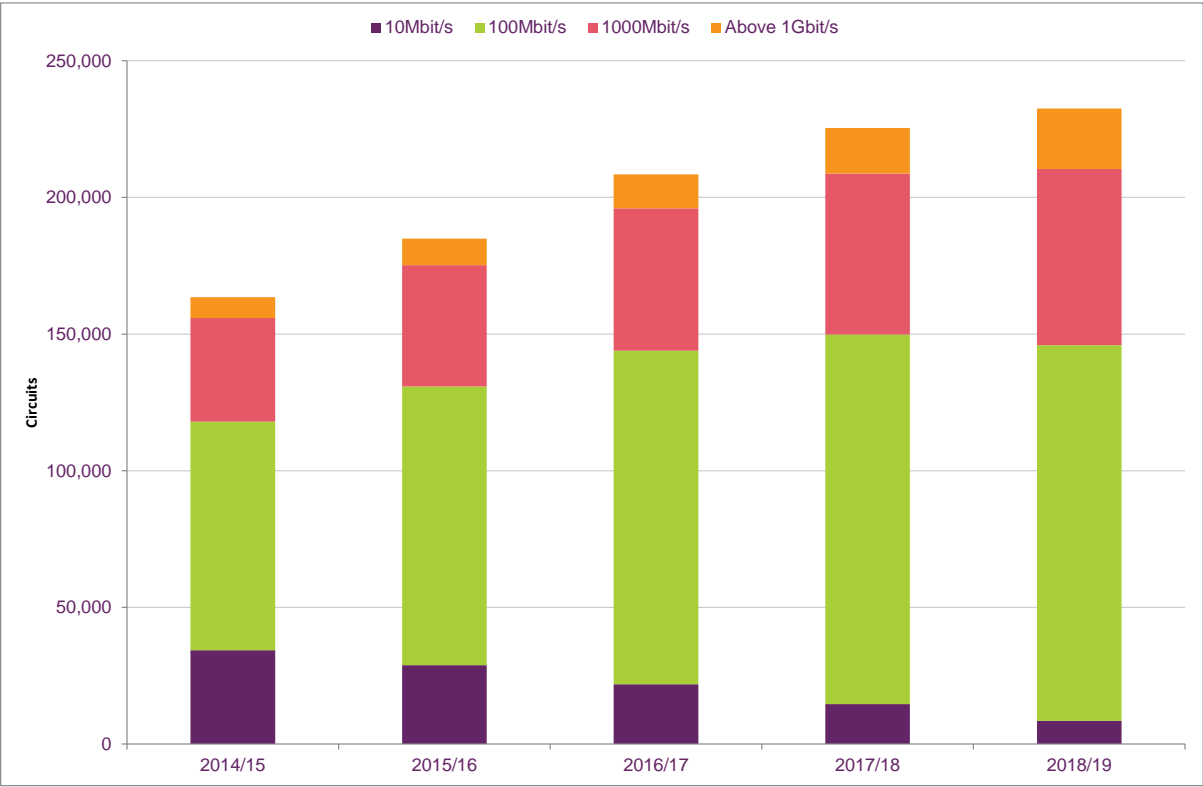
¹⁷⁹ Paragraph 3.50 of Section 3, Volume I.

Figure 5.1 Ofcom forecast of Ethernet circuit volumes (installed base, new connections and annual growth rate, pre dark fibre cannibalisation)



Source: Ofcom forecast

Figure 5.2 Ofcom forecast of Ethernet circuit volumes (installed base by bandwidth, pre dark fibre cannibalisation)



Source: Ofcom forecast. Major bandwidths in terms of total volumes are presented. Other circuits, not

presented on the chart, include mostly Cablelink (about two-thirds of those other circuits in 2014/15 and nearly all in 2018/19) as well as various other products and bandwidths.

Cannibalisation by the dark fibre remedy

- 5.172 As dark fibre becomes available, we would expect CPs to purchase dark fibre for some circuits instead of the active equivalent. Therefore, the availability of dark fibre will reduce the active volumes forecast in the Ethernet basket. This reduction in volumes could have an impact on the charge control 'X' if the changes in volumes are sufficiently large. The reduction in the Ethernet basket volumes due to our cannibalisation assumptions results in the overall Ethernet basket 'X' becoming less negative by approximately 1% (i.e. results in a shallower decline in prices).
- 5.173 To estimate the cannibalisation¹⁸⁰ of active circuits by the dark fibre remedy, we have considered the potential use of dark fibre informed by:
- when the dark fibre remedy will be available (October 2017);
 - qualitative and quantitative information from CPs (via consultation responses as well as responses to our formal and informal information requests);¹⁸¹
 - our own analysis of commercial viability based on the characteristics of the dark fibre remedy; and
 - our own quantitative analysis using data on existing circuits (e.g. prices and circuit lengths).
- 5.174 We set out our analysis in more detail in Annex 33 where we conclude upon the one-for-one cannibalisation rates set out in Table 5.3 below. We also set out there our consideration of the scope for aggregation of active circuits using dark fibre, including our conclusion to not include incremental aggregation of active circuits as a result of dark fibre in the LLCC (beyond what is already included in our forecasts for active services), on the basis that we do not expect it to be sufficiently material in this review period.

Table 5.3 – Ofcom's final cannibalisation assumptions for all circuits

Product		Existing circuits (17/18)	Existing circuits (18/19)	New circuits (17/18)	New circuits (18/19)
EAD LA	10/100Mbit/s	0%	0%	0%	0%
	1Gbit/s		4%	25%	95%
	10Gbit/s		17%	25%	95%

¹⁸⁰ We use the term cannibalisation to refer to the reduction of BT's active circuit volumes as a result of customers switching to dark fibre access product (either in relation to new connections or from existing active circuits).

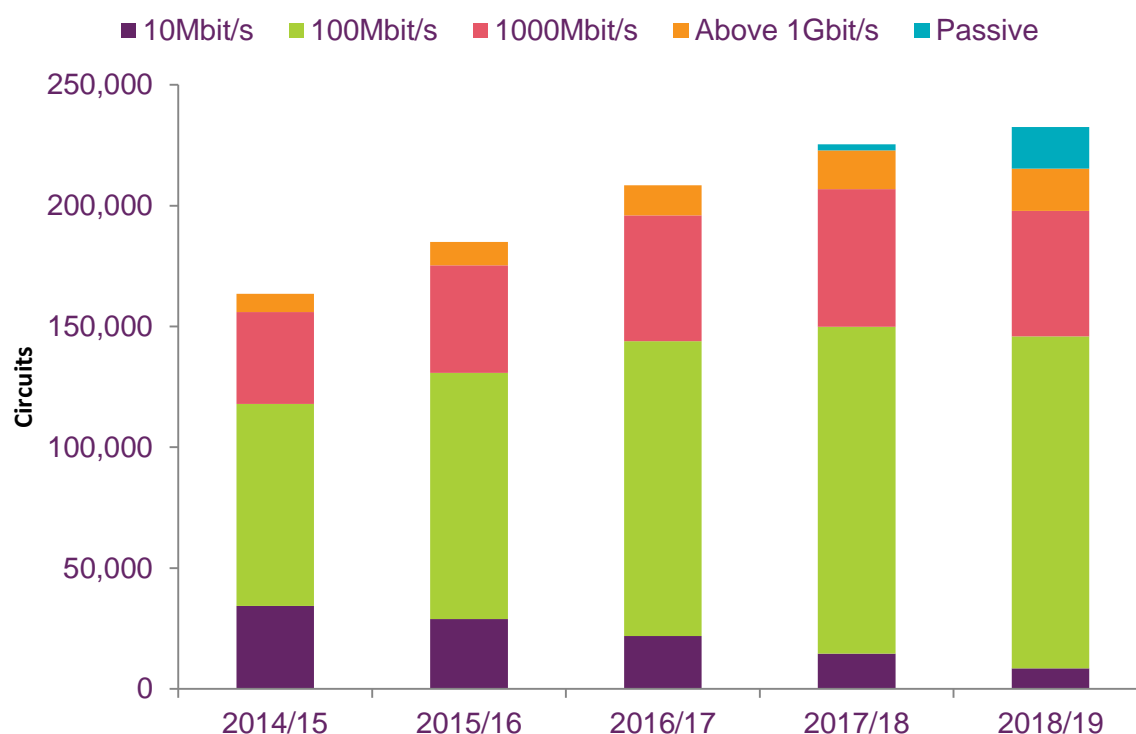
¹⁸¹ In the absence of finalised specifications for dark fibre access (including pricing, availability, migration terms etc.), CPs' ability to forecast their expected use of dark fibre was (understandably) limited, and so many provided more qualitative information.

EAD & WES/BES	10/100Mbit/s		0%	0%	0%
	1Gbit/s		6%	25%	95%
	10Gbit/s		29%	25%	95%
OSA	>1Gbit/s		0%	25%	95%
EBD	1Gbit/s		0%	1%	6%
	10Gbit/s		12%	14%	57%

Source: Ofcom analysis

5.175 Our forecast of Ethernet circuit volumes in the presence of the dark fibre remedy is summarised in Figure 5.3 below.

Figure 5.3 – Ethernet and dark fibre circuit volume forecasts¹⁸²



Source: Ofcom forecasts

We have made an efficiency assumption for Ethernet services of 5% for operating costs and 4% for capex

June 2015 LLCC Consultation

5.176 We proposed an efficiency assumption of 4% to 7%, with a central estimate of 5% per annum for Ethernet services.

¹⁸² This includes all active Ethernet rentals, split by bandwidth, and passive circuits, having converted WES/BES local ends into circuits.

Stakeholders' comments

5.177 A number of stakeholders provided substantial responses to our proposed efficiency assumptions. We received comments on the overall level of the assumptions as well as the detail of our analysis leading to our proposed assumptions. We set out the responses in detail in Annex 29.

Our conclusions

5.178 In calculating the appropriate value of X for the charge control, we take into account an assumed efficiency gain that we expect BT to be able to achieve over the period of our charge control.

5.179 Assessing efficiency requires a degree of regulatory judgement. Our analysis is heavily dependent on the available evidence. For this charge control we have analysed several different sources of data, each of which have their own advantages and disadvantages. We have used the same evidence when assessing efficiency improvements for both Ethernet and TI services, though we have assessed the impact for each set of services separately.

5.180 To establish our efficiency assumptions we have:

- reviewed the efficiency assumptions that we have adopted in other recent charge controls and considered their relevance for these controls;
- analysed regulatory accounting information over the last few years. We have analysed movements in component costs using the operating cost forecasting formulae within the 2016 LLCC Model described above;
- analysed both historical and forecast BT management accounting information that identifies cost transformation and efficiency targets for various BT divisions;
- reviewed information originating from outside BT. This included various benchmarking studies undertaken for BT together with various telecoms-specific and economy-wide studies including estimates made by other regulators; and
- reviewed other public information about BT's cost performance such as public statements made by BT itself and brokers' and analysts' reports.

5.181 We have assessed efficiency on capital expenditure separately to that on operating costs.

5.182 Having taken account of stakeholder responses and more recent data, we have adopted efficiency targets for Ethernet services of 5.0% per annum for operating costs and 4% per annum for capex.

5.183 A detailed discussion of our methodology and assumptions is provided in Annex 29.

We have adopted base year elasticities derived from BT's LRIC model

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5.184 The impact that forecast changes in volumes have on forecast costs in the 2016 LLCC Model is determined by Asset-Volume Elasticities (AVEs) and Cost-Volume Elasticities (CVEs). These represent the percentage changes in assets and operating

costs respectively for a 1% change in volumes. For example, a CVE of 0.5 means that a 2% increase in volumes is associated with a 1% increase in operating costs.

- 5.185 In the June 2015 LLCC Consultation we proposed to estimate AVEs and CVEs for the Ethernet basket using Ofcom-calculated LRIC to FAC ratios, derived from the outputs of BT's 2014/15 LRIC model.

Stakeholders' comments

- 5.186 Those stakeholders who commented on our proposals were broadly supportive of our proposed approach:
- BT agreed "*in principle on the use of AVEs and CVEs*"¹⁸³. Although BT did not comment in general on our proposed approach to estimating AVEs and CVEs for the Ethernet basket, it did comment on our proposed treatment of a specific category of asset cost (i.e. access fibre). We address these comments below.
 - [X] set out that it "*trusts that Ofcom's maths on Asset and Cost Volume Elasticities is correct*" and that "*the previous Fully Allocated Cost to Long Run Incremental Cost model is a fair reference point*".¹⁸⁴

Our conclusions

- 5.187 In light of stakeholder comments we have concluded that, consistent with our proposals in the June 2015 LLCC Consultation, it is appropriate to estimate our base year AVEs and CVEs for the components in the Ethernet basket using Ofcom-calculated LRIC to FAC ratios, derived from the outputs of BT's 2014/15 LRIC model. We consider that this broad approach allows us to generate AVEs and CVEs that are consistent with our base year cost information and generates the best available estimates of the underlying elasticities.
- 5.188 We obtained the outputs of the 2014/15 LRIC model as part of the suite of Additional Financial Information (AFIs) BT provides to Ofcom pursuant to its SMP regulatory accounting obligations. On 1 February 2016, BT informed Ofcom that it had made changes to its LRIC model to correct for certain errors.¹⁸⁵ These modelling changes were not reflected in the AFIs for 2014/15 which BT originally provided to Ofcom. In order to assess the materiality of the errors, we calculated AVEs and CVEs using the revised data and forecast costs on the basis of these elasticities. We found that the revised data resulted in only minor changes to the component AVEs and CVEs relevant to the Ethernet and TI baskets and that as a result there were no changes to our modelled values of X.¹⁸⁶ We have therefore decided that it is not necessary to take into account BT's revised 2014/15 LRIC data for the purposes of this charge control.
- 5.189 A more detailed discussion of our methodology and estimated elasticities is provided in Annex 32.

¹⁸³ BT response to the June 2015 LLCC Consultation, paragraph 86.

¹⁸⁴ [X].

¹⁸⁵ BT resubmitted response to 22nd s135 notice received on 1 February 2016.

¹⁸⁶ Specifically, we found that the use of the revised LRIC data resulted in changes to forecast costs in the final year of the control of less than £1m for both the Ethernet and TI baskets.

- 5.190 Our approach to calculating CVEs and AVEs involves directly calculating elasticities for the individual components¹⁸⁷ used in the cost forecasting using a consistent approach for both the CVEs and AVEs. For CVEs this approach is the same as that adopted in recent previous charge controls, including the 2013 BCMR. However, our approach to calculating AVEs involves a departure from our previous approach, in which AVEs were estimated for a small number of specific asset types from the LRIC model and component specific AVEs were then calculated separately using these asset type values. As we set out in the June 2015 LLCC Consultation, and in Annex 32, we consider the change to our approach to calculating AVEs, as explained below, results in a more consistent approach between the estimation of CVEs and AVEs, but also avoids some of the potential loss of accuracy associated with the previous approach.
- 5.191 Although in general we consider the LRIC to FAC ratios to provide the best available information upon which to base our CVE and AVE estimates, we have made some adjustments to the LRIC to FAC ratios used as estimates of the AVEs (i.e. the use of GRC weights and an amendment to the treatment of access fibre) to reflect specific issues. We set out these changes below.

We have derived AVEs using GRC weights

November 2015 LLCC Consultation

- 5.192 Calculating LRIC to FAC ratios for the individual components upon which to base our cost forecasting involves calculating a weighted average LRIC to FAC ratio for each component across a number of cost categories relevant to that component, as we set out in the June 2015 LLCC Consultation.
- 5.193 For calculating AVEs we calculate the weighted average of the LRIC to FAC ratios for the fixed asset cost categories only.¹⁸⁸ Fixed assets can be valued on the basis of their gross replacement cost (GRC)¹⁸⁹ or net replacement cost (NRC).¹⁹⁰ Therefore, component level LRIC to FAC ratios can be calculated on the basis of GRC or NRC weighted averages of the individual cost category LRIC to FAC ratios.
- 5.194 In the June 2015 LLCC Consultation our proposed approach involved the calculation of NRC-weighted LRIC to FAC ratios. However, in the November 2015 LLCC Consultation we proposed changing to GRC-weighted LRIC to FAC ratios to derive component AVEs.

Stakeholders' comments

- 5.195 Those stakeholders who commented on our proposals were supportive of the approach we proposed in the November 2015 LLCC Consultation:

¹⁸⁷ As set out in Annex 26, the component elasticities are derived from super-component elasticities as BT's LRIC model does not produce outputs at a level of disaggregation beyond the super-component.

¹⁸⁸ Similarly, for example, pay CVEs are based on the LRIC to FAC ratios for the pay operating cost categories only.

¹⁸⁹ i.e. the replacement cost of an un-depreciated asset.

¹⁹⁰ i.e. the replacement cost of the asset taking the extent of depreciation into account.

- BT stated that it “agrees with this approach”.¹⁹¹
- Vodafone stated that it “agrees with the use of GRC rather than NRC weights” as this approach “appears more consistent with the fact that the AVEs are applied to GRC values under Ofcom’s modelling approach”.¹⁹²

Our conclusions

5.196 In light of stakeholders’ comments we have concluded that, consistent with our proposals in the November 2015 LLCC Consultation, it is appropriate to use GRC weights when calculating AVEs for the Ethernet basket components. As the resulting AVEs are applied to GRC under our modelling approach, we consider the use of GRC weights in calculating the AVEs is more internally consistent than NRC weights.

5.197 A more detailed discussion of our methodology and estimated elasticities is provided in Annex 32.

We have adopted a revised AVE for access fibre costs

June 2015 LLCC Consultation

5.198 As set out above, in the June 2015 LLCC Consultation, the LRIC to FAC ratio we proposed for the access fibre cost category in BT’s 2013/14 LRIC model was 0.09,¹⁹³ and the AVE for the EAD Fibre component as a whole was 0.13 (when calculated using GRC weights). Access fibre costs are relevant to a number of Ethernet components, including one of the main components used by EAD services, EAD Fibre.

Stakeholders’ comments

5.199 BT stated that the access fibre AVE that Ofcom used in its cost modelling is too low and would have the effect of understating the cost forecast for the Ethernet basket. It stated that the AVE calculated on the basis of BT’s LRIC model does not appropriately reflect the underlying relationship between forecast changes in the volumes and costs of access fibre. BT argued that Ofcom should use an AVE of 0.8, as it did for the 2013 LLCC, because the underlying factors that led Ofcom to adopt an AVE of 0.8 have not changed. In particular, BT considered that access fibre continues to be an exceptional case as the geographically dispersed nature of its access network means that when volumes are growing BT is required to expand the fibre footprint of its network.¹⁹⁴

5.200 In support of its point, BT submitted evidence on historical Ethernet provisions and the work required for connecting a new Ethernet circuit which shows that since March 2011 approximately [3<] of Ethernet orders required some additional access fibre to be installed to reach the customer’s premises.¹⁹⁵ BT argued that the high level of

¹⁹¹ BT response to the November 2015 LLCC Consultation, page 13.

¹⁹² Vodafone response to the November 2015 LLCC Consultation, page 9.

¹⁹³ In addition to access fibre, the EAD Fibre component is made up of Duct, Land and Buildings, Computers and OM, Other Network Equipment, Other, Motor Transport and Intangibles

¹⁹⁴ In support of its point, BT cited various extracts from Section 20 of the 2013 LLCC where Ofcom set out similar reasoning for departing from BT’s LRIC model when estimating the access fibre AVE.

¹⁹⁵ BT response to November 2015 LLCC Consultation, Figure 1 – Ethernet orders by category, page 21.

provisions that still require further fibre to be laid suggests Ofcom should revert to its assumption in the 2013 LLCC and apply an EAD Fibre AVE of 0.8.¹⁹⁶

Our conclusions

5.201 Having considered BT's points and evidence we have come to the conclusion that the elasticity for access fibre calculated on the basis of BT's LRIC model outputs is too low for the purposes of forecasting Ethernet service costs during this control period. In this regard, we consider that the reasons we gave in the 2013 LLCC for departing from the LRIC model outputs are likely to still be relevant today and throughout the control period. The primary reason is that BT's LRIC model calculates the cost volume relationships (CVRs) from which AVEs are derived using a decremental approach:¹⁹⁷

- for asset types such as Local Exchange, Duct and Main Exchanges, we would expect that an increase/decrease in circuit volumes will predominantly be served by the existing network infrastructure as they are used more/less intensively. We consider that the decremental approach used in BT's LRIC model approach is suitable for estimating elasticities for these asset types when volumes are growing as costs are likely to respond symmetrically to volume increases and decreases; and
- access fibre, on the other hand, is likely to possess fewer opportunities for such economies of scale and density. The expansion of fibre services requires BT in many cases to expand the fibre footprint of its network, rather than serving more customers using the existing assets. This expansion of the network is likely to be geographically dispersed, producing fewer opportunities for economies of scale and density than if the expansion was concentrated in a given geographic area. We consider that the decremental approach used in BT's LRIC model approach is not suitable for estimating the access fibre elasticity as costs are likely to respond differently to volume increases and volume decreases.

5.202 Table 5.4 below shows that consistent with the period considered in the 2013 LLCC, we have forecast that EAD Fibre component volumes will grow consistently year-on-year throughout the current forecasting period.

Table 5.4: Ofcom forecast of EAD Fibre component volumes

	2014/15	2015/16	2016/17	2017/18	2018/19
EAD Fibre component volumes	[X]	[X]	[X]	[X]	[X]
Annual % change		[X]	[X]	[X]	[X]

Source: Ofcom

5.203 We consider that the forecast growth in EAD Fibre volumes indicates that BT will need to make a significant amount of capital expenditure on access fibre over the forecasting period. As set out above, this is likely to be driven by the geographically

¹⁹⁶ BT response to November 2015 LLCC Consultation, paragraph 100.

¹⁹⁷ This assesses the amount of costs saved if BT no longer had the volume of services associated with that product in a given year. This gives a calculation of the incremental costs associated with a service as a share of total costs.

dispersed nature of BT's access network where a significant proportion of customers are likely to require BT to install new fibre to connect their premises. In light of these factors, we have decided to estimate the access fibre AVE using historical cost and volume data (instead of our standard approach of using outputs from BT's LRIC model).

- 5.204 As detailed in Annex 32, we have carried out an analysis of BT's historical capital expenditure and EAD Fibre volumes between 2011/12 and 2014/15 to understand how BT's access fibre costs have responded to increasing volumes. On the basis of this analysis we have estimated the access fibre AVE to be 0.44, which is the average of our calculation of the AVE for 2012/13, 2013/14 and 2014/15. Applying an access fibre AVE of 0.44 to the 2014/15 base year costs used in the LLCC model gives an EAD Fibre component AVE of 0.45.¹⁹⁸
- 5.205 We have considered whether our access fibre AVE estimate is consistent with BT's evidence on Ethernet provision job types, which is detailed in Figure 5.4 below.

Figure 5.4: [REDACTED]¹⁹⁹

Source: [REDACTED]

- 5.206 The information presented by BT shows that around [REDACTED] of provisions require the installation of some additional fibre (Category 2 or higher orders). We consider that the fact that [REDACTED] of Ethernet provisions require no additional fibre to be installed suggests that an AVE of [REDACTED] as proposed by BT would likely overstate the forecast of access fibre costs. We would not expect the costs of access fibre to increase proportionally faster than the volume of circuits that require new fibre.
- 5.207 Furthermore, we consider that BT's practice of recovering fibre installation costs for certain Ethernet provisions through the charging of ECCs (i.e. the installation costs covered by ECCs) indicates that an AVE lower than [REDACTED] is likely to be reasonable:
- as Figure 5.4 shows, between 2011 and 2015 the majority ([REDACTED]) of jobs that may have required the installation of fibre (Category 2, 3 and 4 jobs) were Category 2; and
 - where Category 2 jobs involve connecting an Openreach distribution node(s) to the premises of a single customer (as oppose to multiple customers), BT recovers fibre installation costs directly from the customer being connected by charging ECCs (rather than through rental and connection charges).²⁰⁰
- 5.208 As a result, BT only needs to recover access fibre costs from charge controlled rental and connection services for provisions that are not covered by ECCs (i.e. provisions that require common network build). Therefore, within the access fibre AVE that is used to forecast Ethernet basket costs, the costs of provisions to single customer sites should not be treated as variable. This implies that BT will likely need to recover

¹⁹⁸ EAD Fibre component AVE = (access fibre AVE * access fibre GRC weight) + (other cost categories average AVE * other cost categories GRC weight): 0.45 = [REDACTED] + [REDACTED]

¹⁹⁹ See Volume I, Section 13 for a description of Ethernet order job types.

²⁰⁰ BT response to 28th s135, question A3 received on 19 November 2015.

less than [$\frac{1}{3}$] of the access fibre costs of new provisions from Ethernet basket services.

- 5.209 On this basis, we are satisfied that an access fibre AVE of 0.44 is consistent with the historical information on Ethernet provision job types.

We have adopted a dynamic elasticities approach

November 2015 LLCC Consultation

- 5.210 In the November 2015 LLCC Consultation, we proposed to adopt dynamic CVEs and AVEs that adapt to the changing mix of incremental and fixed and common costs over the control period. We considered that this approach would be more consistent with our conceptual top-down modelling approach which assumes that the level of fixed and common costs recovered from the charge control services in the base year will remain constant (save for inflation and efficiency improvements) over the control period.

Stakeholders' comments

- 5.211 Virgin Media, commented specifically on the use of dynamic AVEs and CVEs for Ethernet. Virgin Media said:

“Due to the extent of volume changes in during the control period, particularly related to the TI basket, we agree with the use of dynamic AVEs and therefore for consistency, applying to this methodology to the Ethernet basket is also appears to be a reasonable improvement in the modelling methodology.”²⁰¹

- 5.212 Vodafone made a general comment that the move to dynamic AVEs increases complexity of the modelling process and reduces the transparency of the regulatory process.²⁰²

- 5.213 Section 6 of Volume II provides a summary of the responses on this issue that are more relevant to the modelling of the TI basket.

Our conclusions

- 5.214 In light of responses, we have decided to adopt the approach proposed in the November 2015 LLCC Consultation and forecast the costs of Ethernet services using dynamic AVEs and CVEs that adapt to the change in the mix of incremental costs and fixed and common costs over the control period. We consider that it is appropriate to use this approach to model Ethernet service costs for this control to be consistent with the approach we are using to forecast TI service costs for this control. Section 6 of Volume II provides an overview of our reasons for adopting the dynamic AVEs and CVEs approach for modelling the TI basket. In summary, where volume changes are significant, assuming that the elasticities are constant may be inconsistent with our assumption that fixed and common costs remain constant. We note that there is significant volume growth in Ethernet services predicted over the forecasting period, as discussed in Annex 32.

²⁰¹ Virgin Media response to November 2015 LLCC Consultation, Page 2.

²⁰² Vodafone response to November 2015 LLCC Consultation, Page 13.

5.215 With respect to Vodafone's concern about the increase in complexity, we recognise that a drawback of making detailed adjustments to the modelling can be an increase in complexity and consequent reduction in transparency. As for the use of dynamic elasticities in this charge control, we consider that the benefits of reaching a more robust modelled outcome are likely to outweigh the drawbacks of increased complexity. In particular, we consider this approach is an important measure to ensure BT can recover its efficiently costs for TI services. For the modelling of Ethernet services, where this modelling change has a smaller impact, we consider that the case is more finely balanced. The primary reason we have decided to adopt the dynamic elasticity approach for Ethernet services in this control is to be consistent with the modelling of the TI basket. This reasoning is further explained in Section 6 and Annex 26 details the steps we have taken to implement the dynamic elasticities approach.

We have adopted pay inflation of 3.0% and non-pay inflation of 2.1%

June 2015 LLCC Consultation

- 5.216 The impact that forecast changes in prices have on forecast costs in the 2016 LLCC Model (volume effects and efficiency improvements are taken into account separately) is determined by our estimate of inflation. We have forecast inflation separately for different classes of costs.
- 5.217 In our June 2015 LLCC Consultation, we proposed pay inflation of 2.5% and other non-pay inflation of 2.6%.

Stakeholders' comments

- 5.218 Only BT responded in relation to our input price inflation assumptions.
- 5.219 BT argued that our assumed pay inflation was too low and instead should be within the range of 2.5% to 4%. BT also said the CPI forecasts we had used when assessing inflation for other non-pay costs were not consistent with the CPI assumptions we used within the 2015 LLCC model²⁰³ and that our RPI inflation assumption was lower than that published by OBR in their Economic and Fiscal Outlook July 2015 publication.²⁰⁴ BT however made no comments regarding any of our other non-pay inflation assumptions. A more detailed discussion of BT's comments is set out in Annex 32.

Our conclusions

- 5.220 Having taken account of stakeholder responses and more recent data, we have adopted the following input price inflation values in our 2016 LLCC model:
- Pay inflation at 3.0% (this is based on November 2015 OBR Earning Index forecasts, November 2015 ONS change in average gross weekly earnings forecasts and forecast BT management accounting data); and

²⁰³ BT response to the June 2015 LLCC Consultation, paragraph 111.

²⁰⁴ OBR, Economic and Fiscal Outlook, July 2015, p.26,
http://budgetresponsibility.org.uk/docs/dlm_uploads/July-2015-EFO-234224.pdf

- Non pay inflation at 2.1% per annum for Ethernet services. Where a specific rate for a non-pay cost item was identified, we have set the modelled rate at that value. We have identified specific rates for energy (for which we use the latest DECC services sector forecasts as at November 2015), accommodation (BT has a long-term arrangement with Telereal that its property rental prices rise at 3% per year) and cumulo costs (2.3% in 2015/16, 0.8% in 2016/17 and RPI after that in line with legislation). We have forecast other non-pay costs at CPI (November 2015 HM Treasury consensus forecast). We have then weighted these assumptions to produce our final non-pay inflation assumptions.

5.221 A more detailed discussion of our methodology and estimated assumptions is provided in Annex 32.

We have adopted a pre-tax nominal cost of capital of 9.8%

5.222 Annex 30 sets out our detailed assessment of BT's WACC. We provide here a summary of our proposals in the June 2015 LLCC Consultation, stakeholder responses and our decision on the WACC to apply to TI and Ethernet.

June 2015 LLCC Consultation

5.223 In the June 2015 LLCC Consultation we proposed to keep several parameters unchanged from the recently completed 2015 MCT Review, including the risk free rate (1.0%) and equity risk premium (5.3%).

5.224 In disaggregating the BT Group asset beta of 0.74 between Openreach copper access (Openreach) and the Rest of BT (RoBT) we used an Openreach asset beta of 0.50; the same as that used in the June 2014 FAMR Statement. Based on weights of 25% and 75% for Openreach and the RoBT, the implied RoBT asset beta was 0.82. We did not consider that it was appropriate to apply an asset beta of 0.82 to leased lines based on our understanding of the likely risk facing leased lines and comparison with comparator telecoms companies. Instead, we proposed a three-way split of the BT Group asset beta between (i) Openreach copper access, (ii) BT's Other UK telecoms services and (iii) the remaining RoBT (largely made up of BT's Global Services division); with the leased lines business associated with Other UK telecoms services (which, as well as leased lines, included BT's other telecoms operations associated with fixed voice, broadband and bundled services).

5.225 Table 5.5 summarises the resulting WACCs we estimated in June. We proposed to use the Other UK telecoms WACC of 10.1% in the 2015 LLCC Model for both Ethernet and TI services. This was similar to the pre-tax nominal WACC of 9.9% used in the 2013 LLCC.

Table 5.5: BT WACC estimates in June 2015 LLCC Consultation

Approach	BT Group	Openreach	Other UK telecoms	RoBT
Pre-tax nominal WACC	10.0%	8.4%	10.1%	12.5%

Source: Ofcom

Stakeholders' comments

- 5.226 Most stakeholder comments focused on the level of disaggregation of the BT Group asset beta.²⁰⁵
- 5.227 BT argued for maintaining the existing two-way disaggregation. FTI (commissioned by BT) considered that the Openreach asset beta should be increased from 0.50 to 0.60 and that this would give a RoBT asset beta of 0.79. FTI considered that while it may be theoretically correct to consider a further disaggregation, the market evidence we provided to support this was primarily hypothetical.
- 5.228 TalkTalk, Sky and Vodafone supported our proposal to further disaggregate the RoBT asset beta but considered that the Openreach asset beta would be below 0.50. They also proposed different groups of services for the purposes of disaggregation: TalkTalk and Vodafone considered that we had defined Other UK telecoms too widely and included what they considered to be certain high-risk activities such as BT Sports while Sky considered we should estimate a separate asset beta specific to leased lines.

Our conclusions

- 5.229 Following the June 2015 LLCC Consultation, we have reviewed stakeholder responses and updated the WACC parameter values. We have decided to maintain a three-way disaggregation of the BT Group WACC, with the Other UK telecoms WACC applied to leased lines
- 5.230 The main changes to the WACC parameters from the consultation relate to the asset beta estimates for Openreach copper access and Other UK telecoms. The net result of these changes is to decrease the pre-tax nominal WACC applied to leased lines from 10.1% in the June 2015 LLCC Consultation to 9.8% now.
- 5.231 We have increased the Openreach asset beta from 0.50 to 0.55. This reflects increases in the asset betas for UK network utilities and UK and European telecoms operators since 2014. Given a revised BT Group asset beta of 0.72 (estimated by NERA using updated data), the resulting RoBT asset beta under a two-way disaggregation would be 0.78 (applying weights of 25% to Openreach and 75% to RoBT). We consider that this is outside a reasonable range for a UK telecoms operator of 0.55 to 0.75.
- 5.232 We commissioned NERA to identify further suitable comparators for BT's ICT and pay TV operations in order to assess whether the evidence would support a further disaggregation of the RoBT asset beta. Based on evidence that the asset betas for ICT comparators are, on average, higher than the asset betas for a range of telecoms companies, we consider that it is appropriate to further disaggregate the RoBT into Other UK telecoms and a new RoBT, as proposed in June.²⁰⁶
- 5.233 We have decided to use an asset beta for Other UK telecoms of 0.70. This asset beta is within our asset beta range for a UK telecoms operator and also delivers a

²⁰⁵ Detailed comments were also made in relation to our overall approach to setting the WACC; the choice of risk-free rate and equity risk premium and our approach to estimating the cost of debt. We set out and respond to these comments in Annex 30.

²⁰⁶ As explained in Annex 30, we do not consider that the evidence on pay TV comparators suggests that a further disaggregation for BT's pay TV operations is appropriate.

new RoBT asset beta of 1.08 (derived by applying weights of 60% to Other UK telecoms and 15% to the new RoBT) which is comparable to the average ICT asset beta when measured on a consistent basis and therefore, in our view, a reasonable estimate of the systematic risk associated with BT's ICT activities.

- 5.234 Table 5.6 summarises the BT WACCs we have estimated. We have used the Other UK telecoms WACC of 9.8% in the LLCC Model for both Ethernet and TI services.

Table 5.6: BT WACC estimates

Approach	BT Group	Openreach	Other UK telecoms	RoBT
Pre-tax nominal WACC	9.9%	8.8%	9.8%	12.4%

Source: Ofcom

We have decided to reflect the impact of the dark fibre remedy

June 2015 LLCC Consultation

- 5.235 We proposed to reflect the impact of the dark fibre remedy on BT's ability to recover its efficiently incurred costs.
- 5.236 Firstly, we took into account the impact of substitution of active circuits for dark fibre and the risks this may pose to cost recovery. To do this, we reflected where dark fibre will make a lower contribution to BT's common costs than the active circuit it replaces (based on our volume assumptions)²⁰⁷ in order to reflect those costs that are non-avoidable (i.e. they are still incurred regardless of whether the proposed dark fibre is being supplied instead of an active circuit). We proposed that based on the differences in common cost contributions from these circuits and our estimated cannibalised volumes, there was a risk that our dark fibre remedy could prevent BT from recovering £4.6m of its non-avoidable efficiently incurred costs in the final year of the charge control.
- 5.237 Secondly, we took into account the recovery of dark fibre implementation costs. In particular, BT will incur additional costs as a result of implementing a dark fibre remedy, over and above those incurred in providing active services only. We said that these costs relate to the development of the dark fibre product and include systems development costs, training and operational costs and additional management overhead. We estimated the efficient costs that BT would incur for the development of a dark fibre product to be [£<] in total, or [£<] [£5m to £10m] in each year of the charge control.
- 5.238 In the May 2015 BCMR Consultation, we considered the risks of stranded assets to be low, and given we did not expect migration of existing circuits we did not consider the risk to be relevant.

Stakeholders' comments

- 5.239 TalkTalk, Sky and Vodafone disagreed with Ofcom's use of a common cost uplift.

²⁰⁷ This is the recovery of costs that are common across all leased lines and is calculated by multiplying the dark fibre forecasts by the difference between the Fully Allocated Costs (FAC) of a circuit and the Long Run Incremental Costs (LRIC) of the active-specific elements of that circuit.

- 5.240 Only BT provided a response to the May 2015 BCMR Consultation that discussed the risk of stranded assets. BT estimated that dark fibre access resulted in stranded assets totalling £[3<].
- 5.241 BT responded that the actual dark fibre implementation costs are likely to be higher than indicated in the consultation, and would only be understood on full completion of the design of the remedy. It proposed that where actual implementation costs differ from those forecasted, any shortfall is recovered as a premium on the Dark Fibre price.²⁰⁸
- 5.242 TalkTalk agreed that BT should be allowed to recover its dark fibre implementation costs. However, it considered the figure of £5 to £10 million to be excessive given that dark fibre is merely a sub-set of the existing Ethernet product (i.e. EAD without the boxes) rather than a brand new product.²⁰⁹

Our conclusions

- 5.243 When regulating BT's wholesale services our general approach is to seek to provide BT with an opportunity to recover its efficiently incurred costs. We are therefore mindful of this when introducing any remedies, as well as when setting any pricing obligations for regulated services.
- 5.244 In order to ensure that BT continues to have the opportunity to recover efficiently incurred costs of supplying regulated, but not necessarily charge controlled, Ethernet services, we have taken into account three items in our cost forecasts:
- cannibalisation of active circuits that make greater contributions to BT's common cost than dark fibre;
 - stranded assets due to cannibalisation of existing circuits; and
 - implementation costs of the dark fibre remedy.
- 5.245 We consider that each of these justify uplifting the forecasted costs in the Ethernet basket, as otherwise there is a risk that the dark fibre remedy will undermine BT's opportunity to recover its efficiently incurred costs.
- 5.246 Given our decision to use an active minus approach to pricing dark fibre, we have considered two options for recovery of the common cost uplift, stranded assets, and implementation costs:
- recovery from dark fibre circuits only; and
 - recovery as part of the Ethernet charge control basket, which would allow recovery from both active and passive circuits.
- 5.247 In order to determine which option for recovery of these efficiently incurred costs is more appropriate we have reviewed the application of the six principles of cost recovery.²¹⁰ This has been considered within the context of our overall dark fibre

²⁰⁸ BT response to the June 2015 LLCC Consultation, paragraph 176.

²⁰⁹ TalkTalk response to the June 2015 LLCC Consultation, paragraph 8.24.

²¹⁰ These principles were endorsed by the Monopolies and Mergers Commission (MMC), *Telephone Number Portability: A report on a reference under s13 of the Telecommunications Act 1984* (MMC,

pricing decisions. We have decided to include a proportion of the common cost uplift, stranded assets, and implementation costs in the Ethernet basket, so in effect they are recovered across active and dark fibre circuits. This ensures that competition between dark fibre and active services is not distorted, allowing the development of competition based on dark fibre access. This is consistent with the approach we have used in previous charge controls (e.g. LLU system set-up costs and LLU line testing costs).²¹¹

- 5.248 In Annex 33, we set out the rationale for applying a cost uplift to ensure recovery of efficiently incurred costs, and set out how we have calculated these for the 2016 LLCC Model.

We have uplifted the cost forecast in the Ethernet basket to reflect cannibalisation of active circuits by the dark fibre remedy

- 5.249 When we set charge controls, we seek to set revenues so they equal forecast costs, in this case CCA FAC, for the whole basket by the end of the charge control period.²¹² Therefore when considering the potential impact of cannibalisation of active circuits by the dark fibre remedy on cost recovery, we consider it appropriate to assess it with reference to forecast costs overall, and in particular, circuit contributions to cost recovery.²¹³
- 5.250 As discussed above, BT may see a reduction in the volumes of its active products, both charge controlled and non-charge controlled services, as a result of the dark fibre remedy being available. BT will therefore lose the cost contribution made by these circuits. While some of these costs will be avoidable, i.e. no longer incurred as a result of the dark fibre remedy being supplied instead of an active circuit, the remaining costs will, broadly speaking, still be incurred irrespective of whether an active circuit or the dark fibre remedy is provided, and so will need to be recovered.²¹⁴
- 5.251 Our full rationale and calculations for how the active per circuit contribution to non-avoidable costs compares to that of the dark fibre remedy is discussed in Annex 33. In summary, we found that the following circuits are forecasted to have a higher FAC

1995).

²¹¹ In the November 2005 LLU Statement, we decided that LLU line testing costs should be pooled with public switched telephone network (PSTN) line test costs and spread across all lines (see paragraph 4.62 in Ofcom, *Local loop unbundling: setting the fully unbundled rental charge ceiling and minor amendment to SMP conditions FA6 and FB6 - Statement*, 30 November 2005, http://stakeholders.ofcom.org.uk/binaries/consultations/llu/statement/llu_statement.pdf (November 2005 LLU Statement)). Also in the December 2004 WLA Statement, we decided that if possible, LLU system set-up costs should be pooled together with equivalent BT Digital Subscriber Line (DSL) system set-up costs and spread across all local loops used to provide DSL services (see paragraph 8.25 in Ofcom, *Review of the wholesale local access market. Identification and analysis of markets, determination of market power and setting of SMP conditions - Explanatory statement and notification*, 16 December 2004, <http://stakeholders.ofcom.org.uk/binaries/consultations/rwlam/statement/rwlam161204.pdf> (December 2004 WLA Statement)).

²¹² In other words, there is an overall FAC-based constraint, with BT free (subject to any sub-caps) to set prices within this overall constraint.

²¹³ This is because if the total FAC constraint is achieved, BT should have an opportunity to recover its efficiently incurred costs (and still be able to flex its prices across services to adjust how it recovers them).

²¹⁴ For simplicity, we abstract here from whether such costs may partially vary with active volumes.

in 2018/19, when active-specific incremental costs are excluded, than the dark fibre remedy:

- all EBD circuits (at 1Gbit/s and above); and
- WES/BES circuits with bandwidth above 1Gbit/s.

5.252 We consider that BT's ability to recover these costs elsewhere is likely to be limited. In particular, services within the charge control will be subject to a FAC-based constraint based on active volumes with dark fibre available. This means that there would not be scope to recover the difference in contributions from services within the charge control. Further, given the dark fibre pricing approach, BT would not be able to recover these costs from the dark fibre price given the overall constraint on the Ethernet basket, which also limits the scope for their recovery from the cannibalised circuits themselves. Similarly, we consider there is a risk that BT would not be able to recover them from active circuits above 1Gbit/s outside of the control, as it would be undercut by competitors offering services using dark fibre. Therefore we consider that there is a risk that these costs could go unrecovered, and so the dark fibre remedy could undermine BT's opportunity to recover its efficiently incurred costs.

5.253 To address this, we have decided to add the non-avoidable cost differentials between the dark fibre remedy and cannibalised active circuits into the Ethernet basket cost forecast.²¹⁵ This would provide BT with an opportunity to recover these costs from the Ethernet basket, and have the benefit of providing BT with some flexibility over how it then sets charges to recover them, including how they are recovered across dark fibre as well as active circuits.

5.254 Based on the cannibalisation volumes we have assumed in each year of the control, these differences in non-avoidable cost contributions equate to approximately £4.5 million of cost recovery potentially at risk during the charge control period as a result of cannibalisation of active circuits by the dark fibre remedy (we set out in detail how we have calculated this in Annex 33).

We have included the cost of stranded assets due to migration from existing active circuits to dark fibre in the Ethernet basket

5.255 The risk of stranded assets arises when existing active circuits migrate to dark fibre. Given that we now assume some migration of existing circuits, we have assessed the risk to BT from stranded assets.

5.256 We consider £1.9m to be a reasonable estimate of the additional cost to be recovered by BT due to stranded assets in this charge control period. We set out our analysis in full in Annex 33.

We have included implementation costs for the dark fibre remedy in the Ethernet basket

5.257 BT will incur additional costs as a result of implementing a dark fibre remedy, over and above those currently incurred in providing active services only, which relate to

²¹⁵ I.e. we multiply the difference in non-avoidable costs by the volume of cannibalised active circuits. Non-avoidable costs are those which we consider will still be incurred regardless of whether the proposed dark fibre is being supplied instead of an active circuit.

the development of the dark fibre product. These additional costs relate to systems development costs and training and operational costs.²¹⁶

5.258 We have calculated that BT will incur approximately £[X] in dark fibre implementation costs, £[X] in this review period.

Our decision

5.259 We have uplifted the Ethernet basket costs in the final year of the control to reflect the lost contribution from cannibalised active circuits, the stranded assets due to this migration, and the implementation costs following the introduction of dark fibre.

5.260 We consider it appropriate to allow BT to recovery these costs over the charge control period and so have the spread these cost uplifts equally over the review period. Furthermore, we have allocated a proportion of these costs into the Ethernet basket, to account for the fact that dark fibre circuits should recover some of these costs as well. We have determined that 87% of these costs should be recovered within the Ethernet basket. This results in the 2018/19 forecasted costs for the Ethernet basket to include:

- **Common cost uplift** – approximately £1.3m in total, or about 0.3% of the Ethernet basket costs.
- **Stranded assets** – approximately £0.7m in total, or about 0.2% of the Ethernet basket costs.
- **Implementation costs** – approximately £[X] in total, or about [X]% of the Ethernet basket costs.

5.261 In combination, these uplifts to the Ethernet basket costs result in the overall Ethernet basket 'X' becoming less negative by approximately [X]% (i.e. results in a shallower decline in prices).

Sub-baskets and sub-caps

5.262 Following our discussion of the potential impact of our dark fibre remedy above we now consider the need for any sub-baskets or sub-caps, completing Stage 1 of our framework.

We have imposed a sub-basket on EAD and EAD LA 1Gbit/s services

June 2015 LLCC Consultation

5.263 In the May 2015 BCMR Consultation we proposed a remedy to ensure that the differences in EAD and EAD LA charges reflect the differences in long-run incremental costs.²¹⁷

5.264 In the June 2015 LLCC Consultation, we proposed a sub-basket on EAD 1Gbit/s services of CPI-13.75% (i.e. the same as our basket X in the June Consultation).

²¹⁶ Based on BT's response of 19 February 2016 to Section C of the 33rd s135 notice dated 17 February 2016.

²¹⁷ May 2015 BCMR Consultation, paragraphs 10.18-10.29.

This was to recognise the risk that BT could, given the direct link between active and dark fibre prices, set excessive EAD 1Gbit/s active prices to disincentivise the use of the dark fibre remedy. We did not impose a sub-basket on EAD LA 1Gbit/s services as we considered the proposed EAD and EAD LA pricing differential obligation²¹⁸ alongside the EAD 1Gbit/s sub-basket would provide sufficient protection for consumers of EAD LA 1Gbit/s and the associated dark fibre product.

Stakeholders' comments

- 5.265 Of the stakeholders who commented on the EAD 1Gbit/s sub-basket, Colt, GTC and Vodafone agreed with the proposal. In particular, Vodafone²¹⁹ and GTC²²⁰ both argued that to the extent certain types of Ethernet leased lines are likely to affect the price of dark fibre, it would make sense to ensure that BT cannot re-balance prices to harm competition. Similarly, Colt argued that it is important for Ofcom to look very closely at how BT might be able to implement Ofcom's proposal to its advantage by distorting competition and prevent this (it provided an example that BT has the incentives to set prices for 100Mbit/s at a very low level in order to rebalance more costs on 1 Gbit/s services).²²¹
- 5.266 BT also stated that it understands the proposal for a sub-basket on EAD 1Gbit/s services controlled at CPI-X, although it argued that the presence of this sub-basket does significantly reduce its flexibility to focus price cuts according to market needs. BT also agreed it would then make sense to exclude EAD LA products from the EAD 1Gbit/s basket if the proposed basis of charges condition was put in place.²²²
- 5.267 However, Virgin Media argued that the proposed sub-basket on 1Gbit/s is not necessary or appropriate in light of its view that dark fibre should be considered outside of this review and that 1Gbit/s EAD is not the appropriate benchmark for pricing. In particular, it argued that BT should be allowed to maintain pricing flexibility for 1Gbit/s EAD services as part of the broader basket, and therefore allow market participants to benefit from the full advantages of the broad basket approach. It also considered that the imposition of a sub-basket (along with the proposed dark fibre remedy) is a material increase in regulatory intervention which is not justified and runs contrary to Ofcom's stated strategy of deregulating where appropriate.²²³

Our conclusions

- 5.268 As set out in Volume I, Section 9, we are implementing a dark fibre remedy outside the CLA, and we would expect there to be two main variants provided: one linked to the price of EAD 1Gbit/s, and the other to EAD LA 1Gbit/s (the resilience options of each of these (in particular, RO2) may also be requested).²²⁴
- 5.269 Given that there is a direct link between active and dark fibre charges, we consider it important to ensure that BT is not able to charge excessive active (and therefore also

²¹⁸ This proposal was for the differential in EAD and EAD LA charges to reflect the long-run incremental cost differential between these two services in year two of the control. Paragraphs 10.18-10.35, May 2015 BCMR Consultation.

²¹⁹ Response to Q6.1, Vodafone non-confidential response to the June 2015 LLCC Consultation.

²²⁰ Response to Q6.1, GTC non-confidential response to the 2015 LLCC Consultation.

²²¹ P18, Colt non-confidential response to May 2015 BCMR Consultation.

²²² Paragraph 146, BT's non-confidential response to the June 2015 LLCC Consultation.

²²³ Virgin Media response to the June 2015 LLCC Consultation, response to Q6.1

²²⁴ This would not include main link prices

dark fibre) charges, and that it does not use its pricing flexibility to disincentivise the use of the dark fibre remedy. It could do this, for example, by focusing price reductions on 10Mbit/s and 100Mbit/s services, while limiting reductions to 1Gbit/s services, which is linked to the dark fibre charge. This risk was also noted by several respondents (as summarised above). In order to mitigate this risk, we have therefore decided to impose a sub-basket on EAD 1Gbit/s service charges. While we recognise Virgin's arguments that this limits the benefits of a wider basket, we consider a restriction is necessary in order to reduce the risk of pricing which could undermine the use of dark fibre (although we are mindful of the extent of restrictions in the specific approach to the sub-basket, as discussed further below).

- 5.270 For the reasons set out in Section 10 of Volume I, we have decided not to impose an EAD/EAD LA pricing differential on BT. In light of this decision not to limit the differential in the EAD and EAD LA charges to reflect the long-run incremental cost, we consider that the same risks around price flexibility could arise for EAD LA charges. Therefore we include EAD LA 1Gbit/s service charges in the sub-basket with EAD 1Gbit/s service charges. This will provide some additional flexibility in prices between EAD and EAD LA variants of active (and therefore dark fibre) services, while still providing protection for consumers from excessive prices.
- 5.271 Having identified the need for this sub-basket, we now need to determine the appropriate level of constraint, both in terms of any starting charge adjustment at the beginning of the control period, and the subsequent annual price changes required. In doing this, we recognise that there is a trade-off. On the one hand, tighter sub-basket constraints will reduce the risk of excessive prices and of disincentivising the use of dark fibre identified above, which will deliver benefits to customers and end users. However, the lower prices which could result (particularly after the starting charge adjustment) may also undermine one of the main reasons for adopting an active minus pricing approach for dark fibre, which is to achieve a price which is higher than a cost-based approach in order to enable some maintenance of the bandwidth gradient and reduce the risk to third party infrastructure operators (as discussed in Annex 21). Therefore we are mindful of this balance when considering the sub-basket constraints.
- 5.272 In relation to the starting charge adjustment, we consider that this sub-basket should be subject to the same reduction as the overall Ethernet basket (i.e. 12%), as we proposed in the June 2015 LLCC Consultation. This is because as set out in Section 7, SCAs place greater emphasis on the benefits to customers and end-users associated with bringing charges quickly into alignment with costs, and having identified the need for a SCA to the Ethernet basket as a whole, we consider it appropriate for customers of 1Gbit/s EAD and EAD LA to also benefit from these reductions. Without this constraint, we are concerned that BT may implement the starting charge adjustment in a way that disincentivises the use of the proposed dark fibre remedy, in a similar manner to that described above, to the detriment of 1Gbit/s EAD and EAD LA consumers. We consider it is reasonable to adopt the same starting charge adjustment since as set out in Section 7, the level chosen for the SCA is consistent with our general preference for glide-paths (and means we would expect the majority of the difference between forecast revenues and costs in 2015/16 would be closed by the glide-path instead). Therefore, we would not expect this to pose a significant risk to our rationale for adopting an active minus pricing approach, but will still allow consumers of 1Gbit/s EAD and EAD LA circuits to benefit immediately from the price reductions. Therefore the 1Gbit/s EAD and EAD LA sub-basket will be subject to the 12% SCA.

- 5.273 In terms of the level of the sub-basket constraint throughout the charge control period, we proposed to adopt the same control as the overall charge control basket in the June 2015 LLCC Consultation, to ensure that these charges fall in line with the overall basket. However, having considered this further, we are concerned that this constraint may be too restrictive and risk undermining our rationale for adopting an active minus pricing approach as set out in Annex 21. This is because we are concerned that if the sub-basket is subject to the same constraint as the overall Ethernet basket, the 1Gbit/s active minus price may tend significantly towards a cost based approach by the end of this review period. If this were the case, we consider it would reduce some of the identified benefits of the 1Gbit/s active minus price relative to a cost based approach, particularly in relation to providing BT with a greater opportunity to set an efficient bandwidth gradient and the reduction in the risks to rival infrastructure investment.²²⁵
- 5.274 As a result, we consider that this potentially runs contrary to the rationale for our dark fibre pricing approach, and as such, a looser sub-basket than proposed in the consultation will provide a more appropriate balance between the concerns identified above. We also recognise there are likely to be additional benefits from adopting a looser sub-basket constraint on EAD and EAD LA 1Gbit/s services, as it will also provide BT with greater flexibility to respond to the imposition of dark fibre through its active prices which are subject to the LLCC (we discuss the potential need for active price rebalancing further in Annex 19). As a result, we have considered an alternative level for the sub-basket.
- 5.275 While a sub-basket which mirrors the overall basket constraint may be too restrictive, at the other extreme we consider it would not be necessary or appropriate for BT to increase the prices in real terms for 1Gbit/s EAD or EAD LA services during this review period. We consider that this view is consistent with our rationale for the SCA applied to the sub-basket (i.e. it would appear counterintuitive to impose a SCA for the reasons set out in Section 7, and then immediately allow prices to rise) as well as our CPI-CPI sub-cap proposals discussed below. To ensure prices did not increase in real terms, it would require a controlling percentage of 0%.
- 5.276 Therefore we consider that an appropriate level for the sub-basket is between these two extremes: maintaining BT's current prices is more consistent with our rationale for an active minus pricing approach but raises the risks of excessive prices and BT being able to undermine the use of dark fibre, while applying the overall Ethernet basket controlling percentage is the reverse. In the absence of a clear alternative, we consider approximately half of the value of X to be a reasonable basis for the purposes of setting the sub-basket constraint. We consider that this level still provides an appropriate balance by protecting consumers from excessive prices for 1Gbit/s EAD and EAD LA services as well as dark fibre, but while being mindful of the rationale for introducing an active minus pricing approach.²²⁶ We also consider this provides a degree of flexibility to BT in how it sets prices in order to recover its common costs efficiently, which is one of the benefits of a broader basket.

²²⁵ We also note that if we had adopted a cost-based dark fibre approach, the costs associated with the introduction of dark fibre (e.g. implementation costs) are likely to have been recovered from dark fibre volumes only, further reducing the differential between the 1 Gbit/s active minus price and a cost-based price.

²²⁶ Our analysis suggests this significantly reduces the risks of the 1Gbit/s active minus prices tending towards a cost-based price at the end of this review period.

5.277 Therefore we are imposing a sub-basket on EAD and EAD LA 1Gbit/s services of CPI-6.75%.

We have imposed a sub-basket on main link services

June 2015 LLCC Consultation

5.278 We proposed a sub-basket on main link services.

Stakeholders' comments

5.279 BT disagreed that there is a need for a separate main link sub-basket. According to BT, this would create high complexity and over-constrain its flexibility when complying with the charge control. It also said that there are issues with granularity of the main link charges because Openreach must adjust main link prices in 0.012p increments due to system constraints. BT said that it is not possible for it to make any price reductions to main link which would have an impact on annual revenue of [x].²²⁷

5.280 BT also argued that the main link sub-basket is not necessary as it constitutes a third layer of sub-basket with main link already included in both the Ethernet basket and the EAD 1G sub-basket.

Our conclusions

5.281 An EAD circuit that spans more than one serving exchange incurs a main link charge, which is calculated based on the radial distance between the two serving exchanges corresponding to each customer site. Openreach currently charges £0.372 per metre for all standard Ethernet main links at bandwidths up to and including 1Gbit/s.²²⁸

5.282 As main link charges are sometimes incurred when purchasing BT's EAD circuits, there is a risk that BT may use its pricing flexibility to maintain relatively high main link charges as a means of disincentivising the use of the dark fibre remedy. Therefore, in order to mitigate this risk we have imposed a sub-basket of CPI-6.75%, consistent with the EAD 1Gbit/s sub-basket, on all main link charges for services that provide bandwidths up to and including 1Gbit/s. This will ensure that these prices fall at least in line with the EAD 1Gbit/s sub-basket.

5.283 We acknowledge BT's point regarding systems constraints and their inability to change main link charges by more than certain discrete increments. While we are mindful of such factors when designing our policies, in this case we consider that there are other, more important factors, such as the fact that BT may use its pricing flexibility to disincentivise the use of the dark fibre remedy (as mentioned above). If BT is unable to reduce charges in the main link sub-basket by the minimum amount required by the sub-basket, it also has flexibility within the basket to reduce these charges by a larger amount and to recover the difference elsewhere within the basket.

²²⁷ Available from the Openreach price list at <https://www.openreach.co.uk/orpg/home/products/pricing/loadProductPriceDetails.do?data=0d0zetWgShsiqKWjcN2Y5WJA8BGGqsBLxL7lgSM4fRpZ6rNZujnCs99NbIKJZPD9hXYmijxH6wr%0ACQm97GZMyQ%3D%3D>

²²⁸ BT response dated 4 March 2015 to question B2 of the 13th s135 notice dated 26 February 2015.

- 5.284 As is the case under the current control, the main link sub-basket does not fall within the EAD 1Gbit/s sub-basket; rather, it is a separate sub-basket within the Ethernet basket. Given this, it is unclear to what extent an additional sub-basket creates materially more complexity for BT.
- 5.285 Furthermore, for the same reasons discussed for EAD 1Gbit/s services above, we also have decided that main link charges should be reduced by at least 12% at the start of the control period in order to ensure consistency with the starting charge adjustment.

We have imposed a sub-basket on Interconnection services and Cablelink

June 2015 LLCC Consultation

- 5.286 We proposed a sub-basket on Interconnection services. We also proposed a CPI-0% control on Cablelink.

Stakeholders' comments

- 5.287 BT said that current BTL revenues form a very small portion of the overall basket. Therefore, in BT's view, the complexity introduced by this requirement will outweigh any intended benefits.²²⁹
- 5.288 BT agreed with a CPI-0% price control for Cablelink, and considered that the proposed controls enable BT to recover costs and make any necessary small adjustments reflecting an increase in costs to existing pricing for Cablelink.

Our conclusions

- 5.289 In order to consume wholesale access services, CPs need to be able to interconnect their network with that of BT. This interconnection is thus essential for any wholesale remedy to be effective.
- 5.290 For wholesale CISBO services up to and including 1Gbit/s, BT currently offers the following types of interconnection:
- Customer-Sited Handover (CSH). BT provides two types:
 - without aggregation: BT terminates individual circuits at the CP's site without aggregation (i.e. interconnection is part of the service and there is no separate interconnection link); and
 - with aggregation: BT supplies Bulk Transport Link (BTL) which aggregates multiple EBD services for delivery over a single interconnection link to the CP's site. BT provides a Points of Connection (POC) at the site of the interconnecting communications provider. In order to do so, BT has to extend its network out to the point of interconnection and provide a CSH link along with CSH POC equipment.

²²⁹ BT response to the June 2015 LLCC Consultation, paragraph 146.

- In Building Handover (IBH): BT provides a POC at collocation space rented by a CP in a BT local exchange. Currently BT terminates individual circuits in the collocation space without aggregation.
- 5.291 CPs do not need to purchase a specific interconnection product from BT to connect EAD and WES circuits to their network. Both IBH and CSH (without aggregation) are already incorporated within the EAD and WES circuits.
- 5.292 However, CPs that wish to aggregate multiple EBD circuits at a customer site currently need to purchase the BTL product. Current take-up of BTL has been low. There were [3<] BTL circuits in the UK²³⁰ in 2014/15 and [3<]. This is forecast [3<] by the end of the charge control period.²³¹
- 5.293 There are similarities in the characteristics of BTL products with the POH interconnection products in the TI market. Given they are purely sold externally by BT and are essential for infrastructure competition for certain products, there could be a competitive risk of placing them in a broad basket without any further constraints as BT would have an incentive to increase interconnection charges and hinder other CPs' ability to compete in downstream markets. The fact that these products constitute a very small portion of the basket by revenue would make it much easier for BT to focus price-cuts elsewhere. Furthermore, given that these products are currently subject to a sub-basket, we disagree with BT that continuing to do so would introduce materially more complexity. We have also considered whether it is appropriate for the charges for BTL circuits to be set at LRIC, similar to POH products in the TI market in 2011 and our approach to other interconnection products. However, this would require a significant bottom-up modelling exercise which we do not consider would be proportionate given the low numbers of these circuits.
- 5.294 Cablelink is a product in support of interconnection services that allows a CP to connect its PoP within the BT exchange with their fibre outside the exchange, and has both internal and external variants. The internal variant allows a CP to connect two remote licensed areas of the BT exchange building (i.e. two separate areas in which the communications provider has installed its equipment), to connect CP equipment in an exchange to an Openreach optical fibre frame, or to connect equipment in the CP's licensed area to a pre-existing fibre entering the exchange building via the cable chamber. The external variant allows a CP's external fibre cable to be pulled into the exchange building by BT and routed to the CP's licensed area.
- 5.295 Following the receipt of BT's latest cost estimates, we have found that BT's charges for Cablelink are significantly out of line with its costs. As a result, we no longer consider that a CPI-0% control, as proposed in our June 2015 LLCC Consultation, would be an appropriate control on these charges. We therefore consider that Cablelink should be subject to the same control as the Ethernet basket given that these products are necessary to support interconnection and the wholesale services included in the basket. However, we have similar concerns as set out above in relation to BTL about placing these products in a broad basket without any further constraints.

²³⁰ With the data available to us, we are unable to identify the exact number of BTL circuits outside of WECLA, although it is likely to constitute a significant majority of the UK figure.

²³¹ BT response dated 29 January 2015 to question B2 of the 8th s135 notice dated 12 January 2015.

- 5.296 We have therefore decided to set a sub-basket, which will cover BTL products and Cablelink, and has the same value of X as for the Ethernet basket (CPI-13.5%). We believe that this strikes an appropriate balance between ensuring that CPs are able to consume Ethernet services, and the importance of these products for competition, and cost recovery. By reducing the price of these products, the competitive disadvantage OCPs face relative to BT is reduced.
- 5.297 As with EAD 1Gbit/s and main link charges, we have also decided that charges within the interconnection and Cablelink sub-basket should be reduced by 12% at the start of the control period.

We have decided to impose a TCO constraint on each EAD and EBD service, and a sub-cap on all other charges

June 2015 LLCC Consultation

- 5.298 In the June 2015 LLCC Consultation, we proposed a CPI-CPI sub-cap on each charge for all services within the Ethernet basket.²³² In reaching this proposal, we recognised the pricing flexibility BT may require in light of the introduction of a dark fibre remedy,²³³ and depending on the scale of active rebalancing required, there may be a concern that sub-caps could be unduly restrictive on charges such that this rebalancing is prevented. However, we considered that given the proposed value of X for the basket, our illustrative estimate of the potential scale of price rebalancing that may be required, and our assessment of starting charges, there was unlikely to be a need for Openreach to increase any charge in nominal terms. As such, we considered that on balance the proposed sub-cap would allow a degree of flexibility for Openreach to rebalance its active charges and recover costs in the way that it judges to be efficient, while restricting its ability to increase any given charge.

Stakeholders' comments

- 5.299 In its response to the June 2015 LLCC Consultation, BT argued that we had understated the degree of price rebalancing that would be required as a result of dark fibre (it argued that it would expect rebalancing of £70-100m a year, or approximately 10% of in-basket revenues at 2015/16 prices). It also claimed it would need to make significant changes to the pricing structure (with new product variants needing to be priced at a level above the current (averaged) prices), which it claimed the sub-cap would appear to prevent.
- 5.300 BT argued that if Ofcom proceeds with such sub-caps, the mechanism should be changed for the main charges such that sub-caps apply to a one-year Total Cost of Ownership (TCO) including connection, rental and main link charges over one year.²³⁴ It argued this would allow for the flexibility of rebalancing connection charges, to maintain payback time within [3<] (as payback times will significantly increase in this control).²³⁵

²³² See paragraph 6.164-6.177 of the June 2015 LLCC Consultation.

²³³ This is because the high contributions to cost recovery it currently earns from higher bandwidth circuits are unlikely to be sustainable in the long term if the proposed dark fibre remedy is available.

²³⁴ BT stated that it accepts that a cap on individual charges is appropriate for ancillary charges.

²³⁵ BT non-confidential response to the June 2015 LLCC Consultation, paragraph 146 and 354.

Our conclusions

- 5.301 A broad basket gives BT flexibility to set charges in an efficient way to recover common costs, but we impose sub-caps when we consider that this flexibility should be limited. This was the case in the March 2013 BCMR Statement, where we imposed a sub-cap (RPI-RPI) to cover the charges for all other services within the Ethernet basket, excluding those already covered under the Interconnection sub-basket, in order to limit BT's ability to increase the prices of particular services in any given year.²³⁶ This was because, given the proposed value of X for the basket and our assessment of starting charges, we considered that there would be no need for Openreach to increase any charge in nominal terms.
- 5.302 In this case, our starting position is to set a sub-cap on charges for all services within the Ethernet basket, including those already covered under the 1Gbit/s EAD and main link sub-baskets, in order to limit BT's ability to increase prices of a particular service in a sub-basket. While the level of the sub-cap is based on a judgment as to what level appropriately balances our objectives, consistent with previous decisions, we would expect to set this cap at CPI-CPI. This would again be to maintain a certain degree of flexibility for Openreach to recover costs in the way that it judges to be efficient, while restricting its ability to increase the charges of particular services in any given year (given the negative value of X for the basket).
- 5.303 However, in contrast to the March 2013 BCMR Statement, in this control we are requiring BT to provide a dark fibre product, priced with reference to its EAD and EAD LA 1Gbit/s products. As discussed in Annexes 19 and 21 we consider it is likely that BT will need to rebalance its active prices (to a greater or lesser degree) as a result of the proposed dark fibre remedy being available. This is because the high contributions to cost recovery it currently earns from higher bandwidth circuits are unlikely to be sustainable in the long term if the proposed dark fibre remedy is available.²³⁷ BT is therefore likely to require some pricing flexibility in order to manage its response to the introduction of dark fibre and facilitate any active price rebalancing it determines necessary and appropriate, in order to remain competitive and to not undermine its cost recovery.
- 5.304 Depending on the scale of rebalancing required, there may be a concern that sub-caps could be unduly restrictive on prices for charge controlled services such that the necessary rebalancing could not occur.²³⁸ We have therefore considered whether BT is likely to require greater flexibility in its pricing than permitted by a sub-cap.
- 5.305 To do this, we have initially considered the potential scale of active price rebalancing that could be required if BT sought to fully rebalance its prices in response to dark fibre to maintain cost recovery. Within this context, we have then considered the appropriate level for the sub-cap and how it is applied to all charges within the Ethernet basket.

Analysis of the potential scale of active price rebalancing which may be required as a result of dark fibre

²³⁶ Annex 20, March 2013 BCMR Statement.

²³⁷ We consider that our proposed dark fibre design significantly reduces the risk of density and distance based arbitrage opportunities (as discussed in Annex 19). Therefore we consider that targeting the bandwidth gradient is likely to be the main driver of the need for active price rebalancing.

²³⁸ At an extreme, this could pose a risk to cost recovery overall.

5.306 In the June 2015 LLCC Consultation, we carried out an indicative snapshot analysis of the potential scale of price rebalancing that may be necessary in light of our proposed dark fibre remedy, to inform our view of sub-caps. To do this, we:

- first identified which circuits would be most likely to be commercially viable with dark fibre priced on a 1Gbit/s active minus basis, by comparing the 2015/16 active price with the dark fibre price plus the active-specific incremental costs. Where the former is greater than the latter, we assumed the circuit could be viable with dark fibre and therefore some price rebalancing is likely to be necessary for BT to remain competitive; and
- Secondly, we estimated the scale of price rebalancing that BT may need to implement for these identified active circuits in order to remain competitive with the dark fibre-based alternative, by multiplying the differential between the active price and the price of dark fibre plus the active specific incremental costs by the corresponding volumes in 2018/19.²³⁹

5.307 We used 2015/16 costs and prices despite recognising the limitations of this (given estimating prices for 2018/19 where revenues for regulated products are expected to be in line (on average) with costs would be highly speculative), but 2018/19 volumes so as to reflect the expected increase in higher bandwidth circuits in the future (in order not to underestimate the scale of rebalancing). On this basis, we estimated that approximately £2 million could, in aggregate, ultimately need to be rebalanced from higher bandwidth circuits as a result of the proposed dark fibre remedy being introduced on a 1Gbit/s active minus approach. We noted this would be a one-off rebalancing of prices, and equated to less than 1% of the forecast Ethernet basket revenues in 2018/19 (without the X).²⁴⁰

5.308 As summarised above, BT agreed with our general methodology, but argued the scale of rebalancing required would be significantly larger than we had indicated. This was primarily due to its more granular data which revealed potential rebalancing for variants which were averaged in the data we used (for example, our analysis of 1Gbit/s EAD circuits was based on a blended average of all variants (e.g. RO1, RO2, Extended Reach etc)), but BT considered each variant individually.

5.309 Notwithstanding this data granularity issue, we consider (and previously noted) that there are clear limitations to this illustrative analysis, particularly given the use of 2015/16 cost and price data. This is because current revenues are in excess of costs, which means any estimate of price rebalancing based on current prices is likely to overstate the actual price rebalancing which is required for cost recovery purposes. Put another way, not all revenue lost from higher bandwidth circuits will necessarily need to be recovered from elsewhere in order to maintain cost recovery. As such, while BT's more granular analysis may provide a reasonable estimate of the active price rebalancing that could be required to maintain existing revenues, it is

²³⁹ This was on the basis that at the extreme, we might expect that all active circuits which can viably be provided with dark fibre could ultimately end up being priced at a level equal to the dark fibre price plus the active-specific incremental circuit costs so that BT remains competitive (otherwise, if BT tried to price such circuits above this level, equally efficient CPs could switch to dark fibre and supply the active-specific incremental costs themselves).

²⁴⁰ In comparison, this figure increased to approximately £78m under an average active minus dark fibre pricing approach (or 12% of the forecast Ethernet basket revenues in 2018/19 (without the X)). This illustrated the potential impact of the design of the passive remedy (and in particular, the pricing options) can have on the risk of distributional concerns.

likely to overstate the actual price rebalancing which is necessary so as not to undermine its ability to recover its efficiently incurred costs.

- 5.310 Our key concern is price rebalancing for cost recovery purposes, not to maintain current margins or revenues. Indeed, irrespective of the results of the rebalancing analysis, we were not seeking (and would not seek) to give BT any additional revenue. As such, we have considered whether there is a more relevant measure of the price rebalancing that may be required.
- 5.311 In this regard, we consider that to the extent there is a genuine need for costs that were previously recovered from high bandwidth circuits to be recovered from lower bandwidth circuits, this is already reflected in the LLCC to the extent it is likely to occur in this review period. This is because, as discussed in Annex 33, we have uplifted the Ethernet basket cost stack to reflect fixed and common costs no longer recovered from circuits which are forecast to switch to dark fibre in this review period²⁴¹ (and therefore the costs that need to be recovered from other services in order to maintain cost recovery). Importantly, this adjustment does not reflect current returns in excess of costs for these circuits – it only includes the rebalancing required for cost recovery (rather than revenue maintenance) purposes.²⁴² Therefore we consider that this approach provides a more appropriate indicator of the scale of rebalancing that may be required in this review period for cost recovery purposes than one based on pricing.
- 5.312 This common cost uplift is calculated to be approximately £4.5m in total across the review period, with £1.3m included in the Ethernet basket in the final year of the control. This therefore suggests the actual price rebalancing necessary for cost recovery purposes in this review period as a result of dark fibre is of a relatively modest order of magnitude
- 5.313 In addition, the inclusion of these costs in the Ethernet basket has the effect of making the 'X' less negative. Therefore to the extent services in the basket need to be priced higher as a result of dark fibre being available in this review period (and the cost recovery rebalancing from high bandwidth to lower bandwidth circuits that is required as a result), this is already reflected in the LLCC 'X'. Further, despite this rebalancing (reflected in the uplift to the cost stack in the Ethernet basket), we note that the 'X' remains negative and is still relatively significant. This is the case even with the other cost uplifts (i.e. for stranded assets and dark fibre development costs) included (as well as the cannibalisation assumptions). As such, we consider that this suggests that price rebalancing for individual services could be achieved without any nominal prices increases (rather, some prices would be expected to decline at a slower rate than others to achieve the rebalancing).

Implications of this analysis for our sub-cap decisions

- 5.314 As a result of the above analysis, we do not consider that a CPI-CPI sub-cap would prevent BT from rebalancing its active prices. Indeed, this analysis would tend to suggest that the scale of rebalancing would need to be significantly higher than indicated here for a fundamental concern around the imposition of any sub-cap to arise. Therefore we do not consider that a CPI-CPI sub-cap would be unduly restrictive.

²⁴¹ i.e. where dark fibre will make a lower contribution to fixed and common costs than the active circuit it replaces.

²⁴² As a result, it is less than the revenue which would be lost.

- 5.315 However, although in aggregate the above analysis suggests the scale of rebalancing could be achieved within a CPI-CPI constraint, we recognise this potentially masks variability between individual charges. In particular, the structure of prices vary between different active products (both charge controlled and non-charge controlled), with (for example) OSA circuits typically having a relatively high connection charge with comparatively lower ongoing rental charges, while the opposite is the case for EAD circuits. Therefore it may be desirable for BT to have some flexibility to rebalance prices between rentals and connections within the overall CPI-CPI sub-cap constraint when responding to the introduction of dark fibre (BT has also indicated that it may wish to rebalance the structure of its charges between connection and rental charges, as summarised above).
- 5.316 In principle, we do not see any significant competition concerns with such a rebalancing, and indeed recognise the benefits such additional pricing flexibility within an overall TCO constraint could deliver. While this may provide scope for real increases in the price of individual charges (e.g. an increased connection charge), which could raise distributional concerns, it is not clear that this would raise significant concerns since it would be limited by the need for offsetting price reductions on other charges (e.g. reduced rental charges) which are normally purchased together in order to comply with the CPI-CPI TCO constraint. This is particularly so given that, as discussed in Annex 33, we understand that most CPs consider TCO in their purchase decisions, rather than individual charges. In addition, BT will still need to comply with the overall basket X.
- 5.317 BT has suggested that main link should be included (where relevant) in the TCO approach (as summarised above). However, when applying the sub-cap with a TCO approach, we consider that including main link would add significant complexity to any compliance process, given its distance-based charging and the fact it is used for multiple products, with limited additional gains. In addition, as discussed above, we are imposing a sub-basket on main link services given the risk BT may use pricing flexibility to set relatively high main link charges to disincentivise the use of the proposed dark fibre remedy, and these concerns remain. Therefore, we consider it would only be appropriate to include rentals and connections for each product.
- 5.318 BT proposed that the TCO be assessed on a one-year basis. We consider that this would not provide a reasonable reflection of TCO, given that customers typically stay for three years or more. Such an approach would give too high a weighting for connection charges at the expense of rentals. An alternative approach would be to estimate the average customer lifetime for individual products. We consider that this is likely to involve considerable administrative complexity as the average lifetime will vary from product to product, and indeed over time.
- 5.319 We note that, as set out in Annex 34, typical retail contracts for leased lines are around three years – although some are shorter and some longer. We consider that this provides a case for assuming a three year rental for the purposes of assessing TCO. This reflects the fact that, even if the customers have a one year wholesale contract term, customers typically stay for a longer period.
- 5.320 We have therefore decided that, for EAD and EBD services, instead of a sub-cap on each and every charge, we will impose a CPI-CPI constraint on a combined rental and connection sub-basket for each of these services. This means that each product variant e.g. EAD 100 LA, EAD 100 RO1, would be subject to an individual sub-basket constraint which requires that the combination of connection and rental charges does not increase by more than CPI-CPI year on year. In assessing compliance with this sub-basket, we will apply a 3:1 weighting of rental to connection charges, to reflect a

3 year TCO. The sub-cap will also apply to our starting charge adjustments, such that when making the latter BT will not be able to increase the TCO of any EAD or EBD product in nominal terms.

- 5.321 The TCO constraint will apply to EAD and EBD services within the Ethernet basket, including those within the EAD 1Gbit/s sub-basket. For services which have been withdrawn from new supply – and so have no connection charges – the rental charges will be subject to the CPI-CPI sub-cap only. We have decided not to apply the TCO constraint to other services, as these are forecasted to have few new connections over the control period. As noted below, all charges, including ancillary charges, not covered by the TCO constraint will be subject to a constraint of CPI-CPI on each and every charge.²⁴³ For both charges subject to the TCO constraint and other charges subject to the CPI-CPI sub-cap, if CPI were to increase to above 5%, we propose that the cap would adjust to CPI-5%, to avoid the differential between the basket cap and the sub-cap becoming too small.
- 5.322 We believe that this approach maintains a certain degree of flexibility for Openreach to rebalance its active charges (including between rentals and connections) and recover costs in the way that it judges to be efficient, while restricting its ability to increase the relevant charge²⁴⁴ for any product or service. Given the proposed value of X for the basket which reflects the necessary rebalancing required for cost recovery purposes, we consider that there is no need for Openreach to increase the relevant charge for any product or service in nominal terms.

Conclusion

- 5.323 We have therefore decided to impose a CPI-CPI constraint on a combined rental and connection sub-basket for each EAD and EBD service. In assessing compliance with this sub-basket, we will apply a 3:1 weighting of rental to connection charges, to reflect a 3 year TCO.
- 5.324 For services which have been withdrawn from new supply – and so have no connection charges – compliance will be assessed on rental charges only. All other charges, including products in the Main Link and Interconnection sub-baskets, and all ancillary charges falling within the Ethernet basket, will continue to be subject to a sub-cap of CPI-CPI on each and every charge.

We have allowed additional flexibility when replacing an existing service with multiple services, subject to Ofcom agreement

Stakeholders' comments

- 5.325 BT argued that it would need to make significant changes to the pricing structure as a result of the introduction of dark fibre, with new product variants needing to be priced at a level above the current (averaged) prices, which it claimed the sub-cap would appear to prevent. In particular, it argued that it may want to de-average its active

²⁴³ Ancillary charges that contribute less than £1m to annual revenue in the Prior Year will be excluded from the Ethernet basket but will be subject to a safeguard cap of CPI-CPI. We explain the reasons for this decision in Section 9.

²⁴⁴ For some products the relevant charge will be rentals plus connections, while for other services it will be each and every charge, as described above.

products in order to enable improved circuit-by-circuit cost recovery, and referred to the following potential examples:

- de-average the EAD circuit into several variants depending on the start and end point of the particular circuit; and
- set different on-net and off-net EAD prices depending on whether existing infrastructure was in place or not.²⁴⁵

5.326 As a result, BT argued that new EAD product variants introduced in response to dark fibre should be afforded extra pricing flexibility.²⁴⁶ In its response, BT gave an example of possible de-averaged products for new supply, where an EAD standard product was split into four variants:²⁴⁷

- Site to BT Exchange + main link to another BT Exchange to another Site;
- Site to BT Exchange to Site;
- BT Exchange to BT Exchange; and
- Site to BT Exchange + main link backhaul to another Exchange.

Our conclusions

5.327 We are not necessarily adverse to changes to the regulated services in principle, and note that the current legal conditions already provide scope for certain changes to regulated services where BT wishes to make a material change to an existing product.²⁴⁸ However, this provision only applies where BT makes changes to replace an existing service with a single replacement service.

5.328 We consider it is appropriate to allow BT further flexibility to de-average its services, in order to provide multiple service variants, where this would not unduly disadvantage other CPs, particularly given the uncertainty arising from the introduction of dark fibre. However, we consider it important that we retain the ability to assess any new multiple product variants, and their associated pricing, to ensure that there are no adverse impacts on competition. Therefore, we have decided to allow BT further flexibility, but to make this flexibility subject to Ofcom's prior agreement. We have included a draft SMP condition in Annex 35, to provide that, in the event of our agreement, we would consider as a starting point that:

- the new multiple service variants would be subject to the same basket and, where applicable, sub-basket, as the replaced service;
- the prior year prices and volumes that would apply to the new multiple service variants in the year of their introduction would be agreed by Ofcom; and

²⁴⁵ BT also argued it should be able to have further asymmetry between active and dark fibre prices. We discuss this further in Annex 23.

²⁴⁶ Paragraph 146, 152-163, BT non-confidential response to the June 2015 LLCC Consultation.

²⁴⁷ Paragraph 157, BT non-confidential response to the June 2015 LLCC Consultation.

²⁴⁸ Draft SMP Condition 10A.21, Annex 35.

- each individual new multiple service variant would continue to be subject to either the TCO constraint (for EAD and EBD services) or the CPI-CPI sub-cap (for any other services).
- 5.329 By applying the same basket, and, where applicable, sub-basket constraints, we would ensure that BT would not be able to charge a higher weighted average price as a result of any de-averaging within that basket or sub-basket.
- 5.330 We would expect BT to provide us with sufficient detail about how the services and pricing will change in relation to any proposal, including an impact analysis on the internal and external split and the weights that would apply to each new multiple service variant. It should also notify its customers of its proposal to replace an existing service. If we were minded to allow BT to make its proposed changes to services, but felt that the conditions above were insufficient to mitigate any risks associated with the removal of the existing services or the introduction of the new multiple service variants, we may issue a direction to amend the conditions to which the new services would be subject.

We have decided not to impose a sub-basket on other connectivity services

June 2015 LLCC Consultation

- 5.331 In our June Consultation, we noted that the majority of Openreach's products are consumed internally, and so did not consider that any sub-baskets were required in relation to these products. An exception to this is for WES and BES, as external customers are expected to account for around half of WES and BES purchases over the control period. After taking into account the consistency of a sub-basket or sub-cap on BES and WES products with allowing Openreach the flexibility to encourage efficient migration, we proposed not to place a specific sub-basket on BES or WES services. We considered that our sub-cap on all other charges would be sufficient to protect consumers of these services.

Stakeholders' comments

- 5.332 BT agreed with our proposal not to impose a sub-basket on other connectivity services.²⁴⁹
- 5.333 Vodafone argued that there is a need for a sub-basket or sub-cap on WES and BES services. It said that migration is hampered by a lack of clear migration path and BT's slow response to customers willing to migrate and therefore it is not acceptable that BT is allowed to charge relatively high prices for legacy products.²⁵⁰

Our conclusions

- 5.334 As discussed above, a sub-basket may be appropriate for products that are largely consumed by BT's rivals. We have therefore analysed internal and external splits of different products in 2014/15 and also in the final year of the next charge control period based on our volume forecasts.

²⁴⁹ BT response to the June 2015 LLCC Consultation, paragraph 146.

²⁵⁰ Vodafone response to the June 2015 LLCC Consultation, page 49-50.

- 5.335 Our analysis shows that external customers will account for the majority of BES purchases during the charge control period. They are also forecast to account for over half of WES rentals in the last year of the control. This may give BT an incentive to set charges in a way that discriminates against other CPs, for example by targeting fewer price reductions on BES and WES services. These purchasing patterns may point towards imposing sub-caps on these services. However, as noted in our June Consultation, we also need to take into account the consistency of any sub-caps with allowing Openreach the flexibility to encourage efficient migration. If we were to impose a sub-basket cap on BES and WES products, this may limit Openreach's flexibility in determining an optimal pricing structure and it could discourage customers from moving to more efficient alternative services. We note that this is consistent with our decision to adopt a MEA approach for modelling legacy Ethernet services up to and including 1Gbit/s.
- 5.336 In addition to their comment above, Vodafone made a number of suggestions in relation to BT's current approach to migration in their response to the May 2015 BCMR consultation. These comments included a suggestion that Ofcom should impose new regulatory obligations on BT, including the requirement to offer a clear migration path by offering 'managed migration services'.²⁵¹ As noted in Volume 1, section 8, we have decided not to impose a general obligation on BT to offer managed migration packages.
- 5.337 Part of our reason for this decision is that in some cases, the cease and re-provide arrangements currently in place may be more efficient than any migration package offered by BT. Where a managed migration process would be superior to cease and re-provide but is not currently provided by Openreach, CP's could request such a service through the SoR process. Given the options available to CPs, we disagree that a separate sub-basket or sub-cap on WES and BES services is required on the basis that there is a lack of a clear migration path.
- 5.338 In light of these considerations, we have not placed a specific sub-basket cap on BES or WES services. Instead, we consider that our general CPI-CPI sub-cap on all other charges (discussed above) will be sufficient to protect customers of these services.²⁵²

²⁵¹ We have addressed Vodafone's comments in detail in Volume I, Section 8

²⁵² We note that if prices do not increase in nominal terms then, based on 2015 LLCC Model, we expect that the aggregate charges of WES and BES services up to and including 1Gbit/s will remain below DSAC by the end of the charge control.

Section 6

TI services

Introduction

- 6.1 In this Section we discuss our consideration of Stages 1 to 3 of our methodology²⁵³ to designing our charge control for low bandwidth TI services in the UK, excluding the Hull area.²⁵⁴
- 6.2 In particular, we explain our decisions with regard to:
- **Stage 1: identifying the relevant services and appropriate charge control baskets and sub-caps**
 - adopting a broad TI basket; and
 - adopting sub-baskets and sub-caps within the TI basket.
 - **Stage 2: determining the base year costs for the services covered by the charge control**
 - basing the control on BT's costs of provision rather than on those of another operator;
 - using CCA FAC as our choice of cost standard;
 - basing our cost forecasts on the costs and asset values of the existing technology that is currently used to deliver TI services;
 - using the 2014/15 RFS as our base year and making appropriate adjustments;
 - **Stage 3 - forecasting the costs of the services for the duration of the charge control**
 - our volume forecasting assumptions;
 - our efficiency forecasting assumptions;
 - our AVEs and CVEs assumptions;
 - our input price inflation change assumptions; and
 - our cost of capital assumption.
- 6.3 This section follows the framework for charge control design set out in Section 4. We discuss how we have assessed Stages 1 to 3 of the framework in relation to Ethernet services in Section 5 and our assessment of Stages 4 and 5 of the framework for

²⁵³ As set out in Section 4, Volume II of this statement.

²⁵⁴ We no longer define a separate market for regional trunk as we did in the March 2013 BCMR Statement.

both Ethernet and TI services is set out in Section 7 of this Statement.²⁵⁵ In addition, further details of how we have designed our charge controls and estimated costs and revenues can be found in Annexes 26-34.

Summary

We have implemented a single TI basket with sub-cap and sub-basket controls

- 6.4 We have implemented a single charge control basket covering low bandwidth TI services in the UK, excluding the Hull area (the TI basket).
- 6.5 We are also implementing sub-baskets and sub-caps where we consider that the overall basket cap would not offer sufficient protection to customers. Table 6.1 below summarises the structure of the TI basket, together with our sub-cap and sub-basket constraints.

Table 6.1: Scope and structure of the TI basket and sub-cap and sub-basket constraints

Basket	Service within scope	Sub-cap and sub-basket constraints
TI basket	<p>Connection and rental charges for: Wholesale low bandwidth TISBO up to and including 8Mbit/s.</p> <p>RBS, NetStream 16 Longline and SiteConnect.</p> <p>Interconnection services.</p> <p>TI Equipment and Infrastructure.</p> <p>TI ancillary charges (excluding ECCs, TRCs and Accommodation).</p>	<p>2Mbit/s RBS, NetStream 16 Longline and SiteConnect services.</p> <p>Sub-cap on interconnection services</p> <p>Sub-cap on all charges (excluding interconnection services and ancillary charges below £1m annual revenue)</p>

Source: Ofcom

We have determined the appropriate base year costs for the services covered by the charge control

- 6.6 Similar to our approach for Ethernet services in Section 5, we have adopted the CCA FAC cost standard to determine the appropriate mark up for common costs for this TI charge control.
- 6.7 We based our cost forecasts for TI services on the costs and asset values of the existing technology that is currently used to provide them.

²⁵⁵ Our decisions in relation to discounts, which were set out in stage 5 of our June 2015 LLCC Consultation, are set out in Annex 34 of this statement.

- 6.8 As outlined in Section 5, we have made a number of adjustments to ensure that the base year cost data is a suitable basis for forecasting costs for the purposes of setting the charge control.

We forecast significant TI volume decline until 2018/19

- 6.9 We have generated volume forecasts for TI services and forecast all low bandwidth volumes to decline during the charge control period. This is likely to be driven by BT ending support for its Plesiochronous Digital Hierarchy (PDH) platform, which supports sub-2Mbit/s services, the availability of NGA broadband and EFM services and increasing demand for higher bandwidths where Ethernet is a cheaper technology.

We have used an efficiency assumption of 4.5% for TI services

- 6.10 We have used an efficiency assumption of 4.5% for operating cost for the provision of TI services. This is based on a consideration of various sources of evidence. We make no assumption about efficiency on capex for TI services as there is no capital expenditure for TI services in the 2016 LLCC Model.

We have forecast the asset costs for TI services by disaggregating component costs into asset types

- 6.11 We have concluded that it is appropriate given the circumstances of this control to forecast TI capital costs by forecasting separately each asset type for each component. We have, however, retained our typical forecasting approach for TI operating costs (i.e. we forecast them at the component level). This approach is consistent with that proposed in the November 2015 LLCC Consultation.

We have adopted base year elasticities derived from BT's LRIC model

- 6.12 For the same reasons set out in Section 5, we have estimated our base year AVEs and CVEs for the components in the TI basket using Ofcom calculated LRIC to FAC ratios, derived from the outputs of BT's 2014/15 LRIC model.

We have derived AVEs using GRC weights

- 6.13 Consistent with our proposals in the November 2015 LLCC Consultation and for the reasons outlined in Section 5, it is appropriate to use GRC weights when calculating AVEs for the TI basket components.

We have adopted a dynamic elasticities approach

- 6.14 We have concluded that, consistent with our proposals in the November 2015 LLCC Consultation, it is appropriate to forecast the costs of TI services using dynamic AVEs and CVEs that adapt to the change in the mix of incremental costs and fixed and common costs over the control period.

We have revised our forecasting approach for certain costs so costs reduce less steeply as volumes decline

- 6.15 We have adopted an approach that assumes that BT will not make volume driven disposals for TI transmission and accommodation assets. We have taken a consistent approach for accommodation operating costs by adopting a lower CVE of 0.21.
- 6.16 For all other asset types, we have concluded that, consistent with our proposals in the June 2015 LLCC Consultation, it is appropriate to assume that BT can dispose its assets and that the value of the disposed assets will be based on the average age of the asset base. We consider that this is more realistic than the standard modelling approach which assumes that new assets would be disposed.

We have adopted pay inflation of 3% and other non-pay inflation of 3.2%

- 6.17 We have adopted the following input price inflation assumptions:
- Pay inflation at 3.0%;
 - Where a specific rate for a non-pay cost item can be identified, we set the modelled rate at that value. We have identified specific rates for energy, accommodation and cumulo costs. We have assumed inflation for all other non-pay costs at forecast CPI. Weighting these together produces a final non pay inflation assumption of 3.2% per annum for TI services.

We have adopted asset price change assumptions consistent with other recent charge controls

- 6.18 We have adopted the asset price change assumptions outlined in Section 5.

We have adopted a pre-tax nominal cost of capital of 9.8%

- 6.19 As explained in Section 5, we have decided to use a pre-tax nominal Other UK telecoms WACC of 9.8%. Our underlying assumptions and analysis is set out in Annex 30.

Stage 1: Identify relevant services and appropriate charge control basket structure

- 6.20 In Section 4, we set out our principles for basket design. Based on a consideration of these principles, below in this Section we set out our decisions in relation to basket design for TI services.

We have decided to adopt a broad TI basket

June 2015 LLCC Consultation

- 6.21 We proposed a broad basket for all low bandwidth TI services in the UK, excluding the Hull area.

Stakeholder comments

- 6.22 BT, GTC, Virgin, Vodafone and [3<] agreed with our proposals for a broad TI basket including all low bandwidth TISBO services up to and including 8Mbit/s.²⁵⁶
- 6.23 As noted in Section 5, UKCTA did not agree with Ofcom's proposal to adopt broad baskets for Ethernet and TI services.²⁵⁷
- 6.24 Vodafone said that TISBO services are of particular importance to end customers because finding alternatives with similar performance characteristics may be difficult and migration may be very costly. Therefore, in Vodafone's view, Ofcom should not permit BT to use pricing as the sole migration mechanism and provide greater sub-caps and sub-baskets protection. Vodafone suggested that Ofcom may include the migration cost within the existing base year costs to incorporate the costs associated with accommodating migration journeys resulting from platform closure.²⁵⁸
- 6.25 [3<] said it agrees with broad baskets only to the extent that Ofcom ensures the safeguard caps and sub-baskets are designed to overcome the inherent disadvantages Ofcom identify with broad baskets.²⁵⁹
- 6.26 TalkTalk noted that the most obvious way of encouraging migration from legacy products would be to include TI and CI in the same basket. They argued that, since the BT Undertakings prevent this, an alternative approach might be to reallocate some of the common cost that is currently attributed to AI services to TI products in order to encourage migration from legacy products.²⁶⁰ TalkTalk argued that this will allow TI prices to be raised and AI prices to fall, TI and AI prices to remain above LRIC, and BT's overall recovery to remain unchanged.

Our conclusions

- 6.27 As set out in Section 4, in determining the appropriate charge control baskets, we have sought to balance the following four considerations:
- **consistency with other rules** – our design of baskets should take into account other rules and ensure that it does not require BT to breach these other rules;
 - **efficient charging structures** - where the services being considered share substantial common costs, a single basket can be more conducive to efficient charges and cost recovery;
 - **competition** – where the services being considered face different competitive conditions or BT does not use the same wholesale inputs as its rivals, placing them in the same charge control basket may give BT an incentive to set prices in a way that undermines competition; and

²⁵⁶ BT response to the June 2015 LLCC Consultation, paragraph 483; GTC response to the June 2015 LLCC Consultation, page 1; Virgin response to the June 2015 LLCC Consultation, page 4; Vodafone response to the June 2015 LLCC Consultation, page 48; [3<] response to the June 2015 LLCC Consultation, page 20.

²⁵⁷ UKCTA response to the June 2015 LLCC Consultation, paragraphs 2.20-2.24.

²⁵⁸ Vodafone response to the June 2015 LLCC Consultation, pages 3, 4, 6, 8, 10, 11 and 51; [3<].

²⁵⁹ [3<] response to the June 2015 LLCC Consultation, page 15 and 20.

²⁶⁰ TalkTalk response to the June 2015 LLCC Consultation, paragraphs 8.110 to 8.112

- **migration incentives** – where it is appropriate for BT to encourage migration from a legacy service to a more efficient service, placing the services in the same basket would allow BT the required pricing flexibility.

Consistency with other rules

- 6.28 Consistency with other rules, and particularly the BT Undertakings, is an important consideration in our decision to have separate TI and Ethernet baskets. However, it is not a relevant consideration for determining basket design for TI services only, because these pricing decisions are all made by BT Wholesale, and so there is no risk that our decision to allow a broad basket for TI services will require BT to breach these rules.

Efficient charging structures

- 6.29 PPCs and RBS backhaul services account for the majority of low bandwidth TI revenues ([<]).²⁶¹ Our basket includes terminating segments²⁶² and it includes all bandwidths up to and including 8Mbit/s, though in practice BT's services mostly relate to 64kbit/s and 2Mbit/s services.²⁶³ Services across these bandwidths are highly likely to share significant common costs and, for reasons already explained in Section 4, by placing the services in a single charge control basket we consider that BT would have the incentive to set prices and recover common costs efficiently. If we were instead to create separate baskets for each product or for each individual charge, we would have to decide on the appropriate proportion of common costs to be recovered within each basket, which may change over the control period.
- 6.30 Given the complexity of identifying the appropriate pattern of common cost recovery and the benefits of a degree of flexibility should these patterns of recovery change over time, we consider that it is appropriate that BT is afforded some flexibility to identify the appropriate way for these costs to be recovered.
- 6.31 Further, we consider that BT is in a better position than Ofcom to estimate which tariff structures are most likely to expand output and to adjust prices in response to changing market conditions.²⁶⁴
- 6.32 We therefore consider that the promotion of efficient charging structures and cost recovery would suggest it is appropriate to design a broad basket for TI services.²⁶⁵

Competition and migration incentives

- 6.33 In response to TalkTalk's comments, we note that we have adopted separate TI and Ethernet baskets for several reasons, and not only because this approach is

²⁶¹ BT response dated 7 August 2015 to question B1 of the 20th s135 notice dated 24 July 2015.

²⁶² Including elements known as regional trunk under the March 2013 BCMR Statement.

²⁶³ Customers are able to purchase a range of bandwidths below 2Mbit/s but these are generally delivered in multiples of 64kbit/s.

²⁶⁴ In advance of our June 2015 LLCC Consultation, BT Wholesale argued that the TI basket as defined in the March 2013 BCMR Statement gave rise to a number of inconsistencies in the way prices are set. We addressed these points in our June 2015 LLCC Consultation, outlining that the perceived anomalies that existed in the TI basket under the previous charge control period should no longer exist under our decisions. We received no comments on this issue in the responses to our consultation, including from BT Wholesale.

²⁶⁵ We have decided to impose a sub-basket on 2Mbit/s RBS backhaul, NetStream 16 Longline and SiteConnect services. We discuss this further below.

consistent with the BT Undertakings. As discussed in Section 4, we also consider that adopting separate baskets is consistent with the differences in competitive conditions and market trends between TI and Ethernet services. TalkTalk has proposed that an alternative approach to encourage migration from TI services is to reallocate some common costs from the Ethernet basket to the TI basket. As set out below, we consider that the relative prices of TI and Ethernet services are likely to have a limited influence on the level of switching between the two technologies. We therefore consider that a reallocation of this nature would not be an effective means of encouraging migration.

- 6.34 Although we consider a single basket for TI services is appropriate, BT may have an incentive to target price reductions on services that its downstream businesses are more likely to use. As set out in Figure 6.1 below we have compared the internal and external consumption splits for 64kbit/s and 2Mbit/s PPCs in 2014/15 and 2018/19 based on our volume forecasts, disaggregated by the different charging elements of a PPC.

Figure 6.1: BT's internal vs external PPC volumes by charging element and bandwidth [X]

Source: BT response dated 7 August 2015 to question B1 of the 20th s135 notice dated 24 July 2015 and Ofcom forecasts.

- 6.35 The data shows that although BT's downstream businesses currently account for the majority of purchases at 64kbit/s and 2Mbit/s, the former is forecast to change by the end of the control period, with external customers accounting for the majority of 64kbit/s purchases. BT may therefore have an incentive to focus price reductions on 2Mbit/s services during the charge control period, to the detriment of downstream competition.
- 6.36 However, there are also migration considerations as 64kbit/s services are currently delivered using BT's legacy DPCN²⁶⁶ platform, which it intends to close in 2021. This platform is now over 30 years old and BT has indicated that it is difficult to maintain, with both maintenance costs and the risk of service failure increasing over time. Furthermore, we are expecting users of these services to develop and implement migration plans during the next charge control period.²⁶⁷ Additionally, the ROCE for sub-2Mbit/s services is very low,²⁶⁸ and below BT's WACC, so some relative price increase for these services may be appropriate.
- 6.37 Allowing BT flexibility to impose fewer price reductions on 64kbit/s services relative to 2Mbit/s services is consistent with incentivising customer migration from very low bandwidth leased lines to Ethernet or, alternatively, higher bandwidth TI lines (which do not use the DPCN platform) or other services such as broadband.²⁶⁹ We therefore consider it appropriate to include all low bandwidth PPCs in a single basket. We note our decision to apply a sub-cap of CPI+8% to each charge in the TI basket,²⁷⁰ and

²⁶⁶ Digital Private Circuit Network.

²⁶⁷ See Ofcom, *Business Connectivity Market Review: Very low bandwidth leased lines*, 22 March 2016, <http://stakeholders.ofcom.org.uk/consultations/bcmr-2015/statement2016>

²⁶⁸ We have estimated that BT's ROCE for sub-2Mbit/s services was less than [X] in 2014/15.

²⁶⁹ We recognise Vodafone's comment that price is not the only factor that will affect a customer's decision to migrate. Nonetheless, we consider that price is still a relevant factor in their decision.

²⁷⁰ This excludes interconnection services, which will be subject to a separate sub-cap of CPI-CPI, as explained below

consider that this sub-cap on 64kbit/s charges strikes an appropriate balance between giving BT some flexibility to promote efficient migration while ensuring that downstream competition is not distorted by prices which do not reflect costs.

- 6.38 We also note from Figure 6.1 the differences in internal and external purchases of individual PPC elements, for example BT purchases a higher proportion of 2Mbit/s local end and trunk volumes compared to links and distribution.²⁷¹ BT may therefore have a greater incentive to focus price reductions on local ends relative to links and distribution. Also, as discussed in Section 7, our analysis for starting charge adjustments has shown that BT's current PPC 2Mbit/s link charges are higher than DSAC. The fact that they appear to be relatively high *and* more likely to be consumed externally by the end of the control may therefore represent a concern. However, we do not consider that this concern is sufficient to consider separate baskets for these services, but we have considered whether to impose a separate sub-basket on PPC 2Mbit/s links in our consideration of sub-caps below.

Sub-baskets and sub-caps

- 6.39 We now consider the need for any sub-baskets or sub-caps.

We have decided to impose a sub-basket on 2Mbit/s RBS backhaul, NetStream 16 Longline and SiteConnect services

June 2015 LLCC Consultation

- 6.40 We proposed a sub-basket on 2Mbit/s RBS backhaul, NetStream 16 Longline and SiteConnect services.

Stakeholder comments

- 6.41 BT disagreed with our proposal for a sub-basket on 2Mbit/s RBS backhaul, NetStream 16 Longline and SiteConnect services. BT said that since the charge control requires steep price reductions, Ofcom's concern that BT may have an incentive to concentrate price reductions on PPCs, rather than RBS backhaul services is unjustified. According to BT, the sub basket unfairly restricts BT's flexibility to incentivise customers to migrate from very low bandwidth leased lines and adds an unnecessary level of complexity.²⁷²

Our conclusions

- 6.42 After PPCs, RBS backhaul services account for the largest proportion of revenues in the low bandwidth TI basket (around one third in 2014/15).²⁷³ They are provided

²⁷¹ If a PPC is handed over in a different serving exchange to the end-user site, there is a fixed main link charge (we refer to this as a 'link') and a distance-based charge for the terminating segment (we refer to this as 'distribution'). 'Trunk' refers to regional and national trunk; these are distance-based charges based on TAN catchment areas defined in the March 2013 BCMR Statement. National trunk was not regulated while regional trunk was regulated and charge controlled under the March 2013 BCMR Statement. In the Volume I we proposed to include regional trunk within the terminating segments market (Section 5 and Annex 14).

²⁷² BT response to the June 2015 LLCC Consultation, paragraph 485.

²⁷³ BT response dated 7 August 2015 to question B1 of the 20th s135 notice dated 24 July 2015 and Ofcom forecasts.

using the same underlying components as PPC circuits and so should have very similar common costs.

- 6.43 We note the recent decision by the CMA to approve the merger between BT and EE, meaning that BT will become an important downstream customer for RBS circuits, as well as a competitor to other mobile operators. Although many of these sales will now become internal purchases, we note that any price increases on RBS services will act as a transfer charge for BT but as a real charge for other CPs. As this could distort competition in mobile markets, we continue to consider it appropriate to have an explicit safeguard within the charge control to counteract this incentive and protect RBS backhaul customers from any potential incentives BT may have to discriminate against mobile operators.
- 6.44 In this particular case, we consider that it is possible to achieve the benefits of a broad basket, by including both PPCs and RBS services, and mitigate the risk of BT focusing price reductions (increases) on PPCs (RBS) by designing appropriate sub-baskets.
- 6.45 As the price reductions we are requiring for TI services are significantly lower than those proposed in the June 2015 LLCC Consultation, we disagree with BT that our concern that BT may have an incentive to concentrate price reductions on PPCs, rather than RBS backhaul services, is unjustified. It is also unclear to what extent a sub-basket on RBS backhaul services would materially increase complexity.
- 6.46 We consider that imposing a sub-basket constraint on RBS backhaul services within the TI basket provides a safeguard against potential competition concerns, while still allowing BT some flexibility to set prices and recover common costs efficiently. We therefore have implemented a sub-basket cap on 2Mbit/s RBS services that is consistent with the overall basket cap of CPI-3.5%.
- 6.47 We have not decided to include sub-2Mbit/s RBS backhaul services in this sub-basket. Although these are only used by customers that are external to BT, we consider that it is important to allow BT the flexibility to incentivise customers to migrate from very low bandwidth leased lines. We therefore consider that a cap of CPI+8%, which will be applied to each charge for all non-interconnection services (see below), strikes a reasonable balance. This is also consistent with our treatment of sub-2Mbit/s PPC services, where external customers are forecast to account for the majority of purchases by the end of the control period.
- 6.48 Like RBS backhaul services, NetStream 16 Longline and SiteConnect services are currently sold to mobile operators. They accounted for around 4% of low bandwidth TI revenues in 2014/15.²⁷⁴ The reasoning set out above for RBS backhaul services therefore also applies to these services. We therefore also include these services in the 2Mbit/s RBS sub-basket.

²⁷⁴ BT response dated 7 August 2015 to question B1 of the 20th s135 notice dated 24 July 2015 and Ofcom forecasts.

We have decided to impose a sub-cap of CPI+8% on each charge for all non-interconnection services within the TI basket²⁷⁵

June 2015 LLCC Consultation

- 6.49 We proposed a sub-cap of CPI-CPI on each charge for all services within the TI basket.

Stakeholder comments

- 6.50 BT considered that it would be more efficient to allow flexibility to operate charges without the proposed sub-caps which it said are unnecessary as BT is already constrained by the need to meet the charge control basket overall.²⁷⁶ As noted in Section 5, BT also suggested that sub-caps should apply to a one-year Total Cost of Ownership²⁷⁷ including connection, rental and main link charges over one year.²⁷⁸
- 6.51 In its response to our November 2015 LLCC Consultation,²⁷⁹ BT noted that we had not updated the sub-cap conditions. They argued that if the sub-caps remain unchanged there is a significant risk that the basket control will be driven by the sub-caps, and that sub-caps are not intended to be a more binding constraint than the overall basket control, but to restrict the extent to which BT could rebalance prices within the basket. They argued that an appropriate sub-cap would be 7.25% above our value of X for the overall TI basket.
- 6.52 Vodafone said that broad baskets need to be accompanied with safeguard measures (such as sub-caps) to ensure BT is not able to favour the purchasing patterns of its own lines of business.²⁸⁰

Our conclusions

- 6.53 We have explained above that we have imposed sub-basket and sub-caps on particular services, where we have concerns that these charges would not be adequately protected by the overall basket cap.
- 6.54 Our overall TI basket is broad and includes a large number of individual charges and sub-caps which would limit BT's ability to increase the prices of particular services in any given year. As explained above, this broad basket gives BT flexibility to set prices in an efficient way to recover common costs. Nevertheless, we consider that this flexibility should not be unlimited, particularly as charges that have a small weight in revenue terms, e.g. POH, infrastructure and equipment charges, could be significantly increased. Therefore, we consider it appropriate to set sub-caps on each charge for the services within the TI basket.
- 6.55 We have used sub-caps in a number of previous charge controls, including the July 2009 LLCC Statement and March 2013 BCMR Statement. The choice of a level for

²⁷⁵ Interconnection services will be subject to a separate sub-cap of CPI-CPI, as explained below.

²⁷⁶ BT response to the June 2015 LLCC Consultation, paragraph 79.

²⁷⁷ This would mean that the CPI-CPI sub-cap would apply to the aggregation of connection, rental and main link charges for a particular service.

²⁷⁸ BT response to the June 2015 LLCC Consultation, paragraph 146.

²⁷⁹ BT response to the November 2015 LLCC Consultation, paragraphs 176-180

²⁸⁰ Vodafone response to the June 2015 LLCC Consultation; page 48.

the sub-cap is largely based on regulatory judgment, and balancing the benefits of flexibility for BT with the risks to customers or potentially disruptive effects to competition of sharp increases in prices for some services.

- 6.56 We have decided to apply a sub-cap of CPI+8% to all services in the TI basket.²⁸¹ We have adjusted the level of this sub-cap as our original sub-cap, CPI-CPI, is likely to be too restrictive given the change in our overall X for the TI basket since our June 2015 LLCC Consultation. A sub-cap of CPI+8% allows BT a degree of flexibility similar to that proposed in June.
- 6.57 We consider that this is an appropriate degree of flexibility that allows BT to balance charges and recover costs efficiently. It would also promote sustainable competition and confer the greatest possible benefits on end-users by preventing BT from undue rebalancing of charges.²⁸²
- 6.58 We have decided that TI charges would remain subject to a sub-cap on each and every charge. TI services are in decline, with relatively few new connections compared to rentals, such that the 3:1 rental to connection ratio proposed by BT is likely to understate the importance of rental charges to customers. Given that circumstance, we consider that a Total Cost of Ownership approach for TI charges would not be appropriate, and therefore TI rental charges will remain subject to a sub-cap on each and every charge.
- 6.59 Given our concerns that BT may have a greater incentive to focus price reductions on local ends relative to links and distribution and that BT's current PPC 2Mbit/s link charges are higher than DSAC, as set out above, we have considered whether to impose a separate sub-cap on PPC 2Mbit/s links. Our view is that a separate sub-cap is not necessary. External customers are expected to account for just over half of 2Mbit/s link purchases in 2018/19 (compared to slightly less than half in 2014/15). Given that the internal proportion will therefore remain relatively high (i.e. almost one half), BT's ability and incentive to distort pricing in a manner that results in other operators incurring significantly higher overall 2Mbit/s PPC charges than BT's downstream businesses will be limited.²⁸³

We have decided to impose a separate sub-cap of CPI-CPI on interconnection services

June 2015 LLCC Consultation

- 6.60 We proposed that a sub-cap of CPI-CPI on all TI services was a sufficient safeguard for PPC and RBS POH services.

²⁸¹ This excludes interconnection services, which will be subject to a separate sub-cap of CPI-CPI, as explained below. Additionally, ancillary charges that contribute less than £1m to annual revenue in the Prior Year will be excluded from the TI basket and will be subject to a safeguard cap of CPI-CPI. We explain the reasons for this decision in Section 9.

²⁸² A sub-cap at this level also means that this sub-cap will not need to vary if the level of CPI increases above 5%.

²⁸³ We also note that our analysis of aggregate PPC services suggests that, for a three year contract, the charges associated with main links account for around 10% of the total contract value on average. The charges for local ends and distribution represent a significantly higher proportion, almost two thirds combined. Therefore, the charges that account for the biggest proportion of 2Mbit/s PPC contracts are not currently priced excessively.

Stakeholder comments

- 6.61 Stakeholders who responded to the June 2015 LLCC Consultation did not comment in relation to our proposals on PPC and RBS POH services.

Our conclusions

- 6.62 Each PPC purchased by a CP requires a connection between the CP's network and BT's network. This interconnection is provided through a POH that CPs must purchase from BT. POHs are only purchased by OCPs (and not BT itself) and are essential for competition based on TI services.
- 6.63 Given that POH services are purely sold externally by BT and are essential for competition, there could be a competitive risk of placing them in a broad basket without any further constraints, particularly as revenues from POH services were less than 1% of low bandwidth TI revenues in 2014/15.²⁸⁴
- 6.64 In the LLCC PPC Points of Handover pricing review (the September 2011 POH Statement),²⁸⁵ we explained why CPs should only pay charges based on the LRIC associated with their demand for POH and we developed a bottom-up LRIC model for the charges covered in the September 2011 POH Statement.²⁸⁶ They have also been subject to a sub-basket with a price control of RPI-0% since the March 2013 BCMR Statement.²⁸⁷ We do not have evidence to suggest that the costs for POH have materially changed since September 2011.
- 6.65 In the March 2013 BCMR Statement, we also considered the level of other PPC and RBS POH charges that were not covered in the September 2011 POH Statement.²⁸⁸ Rental charges not covered by the September 2011 POH Statement amounted around £1 million in 2013/14.²⁸⁹ [3<]. We consider that it would be disproportionate to undertake a detailed review of these costs, particularly as we found the charges to be consistent with LRIC in the March 2013 BCMR Statement.²⁹⁰
- 6.66 In our June 2015 LLCC Consultation, we asked stakeholders whether CPI-CPI was a sufficient safeguard for PPC and RBS POH services. We believe that CPI-CPI continues to be a sufficient safeguard for PPC and RBS POH services given that Points of Handover were set at LRIC in 2011. This is reflected by the fact that the return on mean capital employed²⁹¹ for these services was negative (-11.9%) in 2013/14.²⁹²
- 6.67 However, since the June 2015 LLCC Consultation we have increased the sub-cap on each and every charge within the TI basket to CPI+8%. We have therefore decided to impose a separate sub-cap of CPI-CPI on interconnection services within the TI

²⁸⁴ £3 million compared to £324 million (BT's 2014/15 RFS).

²⁸⁵ Ofcom, *LLCC PPC Points of Handover pricing review. Final Statement on modification of SMP Conditions - Statement*, 21 September 2011, <http://stakeholders.ofcom.org.uk/consultations/revision-points-handover-pricing/final-statement/> (September 2011 POH Statement).

²⁸⁶ There were eight charges, known as Type II rental charges and Type I additional charges, and these made up over 50% of the total TI POH revenue for 2010/11.

²⁸⁷ Paragraphs 19.97-19.101 in the March 2013 BCMR Statement.

²⁸⁸ Annex 6, July 2012 LLCC Consultation.

²⁸⁹ BT's 2013/14 RFS.

²⁹⁰ Annex 6, July 2012 LLCC Consultation.

²⁹¹ On a CCA FAC basis.

²⁹² BT's 2013/14 RFS.

basket. A sub-cap of CPI-CPI will ensure that overall POH charges will be at no more than their current level in nominal terms throughout the charge control period.

- 6.68 In line with our June 2015 LLCC Consultation proposal for each charge within the TI basket, we propose that, if CPI were to increase significantly to above 5%, then the interconnection services sub-cap would adjust to CPI-5%, to avoid the differential between the basket cap and the sub-cap becoming too small.

Conclusion

- 6.69 We have decided to adopt a broad TI basket as it strikes the right balance between effective charging structures, competition, migration incentives and consistency with other rules. Where we have identified specific concerns, we have addressed these concerns through the use of the following sub-baskets and sub-caps:

- a sub-basket on 2Mbit/s RBS, Netstream 16 Longline and SiteConnect;
- a CPI-CPI sub-cap on interconnection services (or CPI-5% where CPI>5%); and
- a CPI+8% sub-cap on all non-interconnection charges.

Stage 2: Determine base year costs

- 6.70 As set out in Sections 4 and 5, we need to be able to determine all costs relevant to providing charge-controlled services. Below we set out our conclusions on:

- whether to base the control on BT's costs of provision or those of another operator;
- the choice of cost standard;
- the technology upon which we base our cost forecasts;
- the data period used for base year; and
- the adjustments we have made to the base year.

We have based our cost forecasts on BT's costs rather than those of another operator

June 2015 LLCC Consultation

- 6.71 In the June 2015 LLCC Consultation we proposed to base our cost forecasts for TI services on BT's costs of providing business connectivity services rather than those of another operator.

Stakeholders' comments

- 6.72 GTC, [3] and Vodafone agreed with our proposal to base our cost forecasts for TI services on BT's costs. BT agreed that its costs should be used as the base for

Ofcom's forecast costs subject to suitable adjustments.²⁹³ No other stakeholders commented on this proposal.

Our conclusions

- 6.73 As for the Ethernet control and as explained in Section 5, consistent with Ofcom's typical approach to setting charge controls for BT's services, we have decided to base our control on BT's costs of providing business connectivity services rather than those of another operator.

We have decided to use CCA FAC as our cost standard

June 2015 LLCC Consultation

- 6.74 In the June 2015 LLCC Consultation we proposed to use CCA FAC as our cost standard.

Stakeholders' comments

- 6.75 BT agreed with our proposal but noted that BT's CCA should be used but proposed that it should be adjusted to represent a hypothetical ongoing network.²⁹⁴
- 6.76 Vodafone²⁹⁵ argued that, with falling demand, the CCA FAC basis generally used to determine charge controls may not provide a good proxy for the 'competitive level' of prices.
- 6.77 Vodafone argued that Ofcom has generally considered that LRIC+EPMU provides the most appropriate benchmark for setting charge controls. It added that Ofcom uses CCA FAC as a reasonable proxy for LRIC+EPMU as calculating LRIC+EPMU directly is complex and the results are inaccurate.
- 6.78 Vodafone then argued that CCA FAC costs will tend to be above LRIC+EPMU when a product is later in its life cycle (as is the case for TI products). They add that economic depreciation approaches will produce unit costs that which are broadly stable over time, rather than CCA FAC unit costs, which will show increases as utilisation falls.²⁹⁶
- 6.79 Vodafone therefore recommended that Ofcom use a projection of base year unit costs, excluding volume effects, as the appropriate cost bases for setting the charge control.

Our conclusions

- 6.80 Our general reasons for adopting CCA FAC as our cost standard (set out in Section 5) is also applicable to TI services. Vodafone appears to argue that, firstly, CCA FAC is not a reasonable proxy for LRIC+EPMU for TI services in this charge control, and secondly, that since LRIC+EPMU is the more appropriate measure of BT's costs,

²⁹³ BT response to the June 2015 LLCC Consultation, paragraph 80.

²⁹⁴ BT response to the June 2015 LLCC Consultation, paragraph 82.

²⁹⁵ In a report prepared by Frontier: "A review of Ofcom's proposed leased line charge control"

²⁹⁶ Section 4.1, Frontier, "A review of Ofcom's proposed leased line charge control"

Ofcom should use an economic depreciation approach to forecasting the costs of TI services over the charge control.

- 6.81 In 1997, Oftel adopted a regime based on LRIC+EPMU.²⁹⁷ Over time, we have moved to a CCA FAC approach as it is a more practical alternative and can be a reasonable proxy for LRIC+EPMU.²⁹⁸
- 6.82 Historically, for leased lines, we have used a CCA FAC approach. The CCA FAC approach, where applied consistently, should lead to the correct recovery of the costs of an asset over its lifetime. This is the case even though the pattern of cost recovery over the lifetime may be different from that pattern where an economic depreciation approach is used.
- 6.83 Vodafone's argument that LRIC+EPMU is the more appropriate cost standard appears to be based on the assumption that this would be calculated on an economic depreciation basis.²⁹⁹ We note that a LRIC+EPMU approach can be done on either an economic depreciation or CCA basis. In fact, when Ofcom adopted a regime based on LRIC+EPMU in 1997, we explained that this was on the basis of CCA, and not economic depreciation.³⁰⁰
- 6.84 If we adopted a different approach to depreciation at this stage (i.e. moving from a CCA approach to an economic depreciation approach), it would likely lead to a change in the overall recovery of costs for TI services.³⁰¹ Given the potential implications for cost recovery, we do not depart from our historic approach to economic depreciation except where there are good reasons to do so. For example, it may be appropriate in some cases to do so where over time it results in more efficient migration signals or investment/competition incentives.
- 6.85 For the reasons we outlined in Annex 11 of our June 2015 LLCC Consultation, and for the reasons we set out below in our decision not to make a hypothetical ongoing network adjustment, we do not consider there to be material economic benefits from departing from the modelled pattern of cost recovery. We have therefore decided to use CCA FAC as our cost standard for TI services.

²⁹⁷ For example, see Oftel, *Guidelines on the operation of Network Charge Controls*, May 1997. http://webarchive.nationalarchives.gov.uk/20040104233440/http://www.ofcom.org.uk/static/archive/oftel/publications/1995_98/pricing/ncc1097.htm

²⁹⁸ We give more detail for our reasons from moving from a LRIC+EPMU approach to a CCA FAC approach in our 2005 NCC statement – Ofcom, *Review of BT's network charge controls*, 18 August 2005. <http://stakeholders.ofcom.org.uk/consultations/charge/statement/>

²⁹⁹ Paragraph 4.1.4, Frontier, "A review of Ofcom's proposed leased line charge control"

³⁰⁰ Oftel, "Network Charges from 1997 - Consultative Document", May 1997. http://webarchive.nationalarchives.gov.uk/20040104233440/http://www.ofcom.org.uk/static/archive/oftel/publications/1995_98/pricing/ncctitle.htm

³⁰¹ We explain this in more detail in Section 4 of our statement "Valuing Copper Access", 18 August 2005. <http://stakeholders.ofcom.org.uk/consultations/copper/value2/statement/>

We have based our cost forecasts for TI services on the basis of the existing technology used to provide the services

June 2015 LLCC Consultation

- 6.86 We proposed to set charges for the next control period for TI basket services using the costs and asset values of the existing technology that is currently used to deliver these services.

Stakeholder comments

- 6.87 We received no comments from stakeholders on our proposed approach.

Our conclusions

- 6.88 Section 4 sets out our approach to determining the technology assumed in the 2016 LLCC Model, as well as the assessment criteria used to guide our choice as to which approach is appropriate for this charge control. In this Section, we consider the assessment criteria in the context of the services in the TI basket by first summarising our views in the March 2013 BCMR Statement and then presenting our decision for this charge control period.
- 6.89 In the March 2013 BCMR Statement we based our cost forecasts on the existing technology for TI terminating segments. We considered three alternative technologies to TI as potential MEAs for the provision of terminating segments: broadband, virtual private networks (VPNs) and Ethernet.³⁰² We found that we could not identify an MEA, since there were no alternative technologies that fulfilled the conditions of being able to provide the same service as the existing technology to at least the same level of quality and to the same groups of customers.³⁰³
- 6.90 In particular we found that:
- broadband had service characteristics that are significantly different from TI services including, for example, that broadband did not offer dedicated point-to-point connectivity between two customer end points;³⁰⁴
 - VPNs accessed via broadband did not provide the same reliability, performance or security as leased lines services. VPNs accessed via leased lines made heavy use of leased lines as an input and were best characterised as a downstream service rather than as a substitute;³⁰⁵ and
 - Ethernet was not able to replicate certain important service characteristics of TI services. For example, Ethernet could not achieve the same standards in terms of resilience as TI services.³⁰⁶

³⁰² Paragraph 7.55, June 2015 LLCC Consultation.

³⁰³ Paragraph 19.107, March 2013 BCMR Statement.

³⁰⁴ For our full explanation of the service differences see paragraph 19.109, March 2013 BCMR Statement.

³⁰⁵ For our full explanation of the service differences see paragraph 19.110, March 2013 BCMR Statement.

³⁰⁶ For our full explanation of the service differences see paragraph 19.111, March 2013 BCMR

- 6.91 Similarly, in the March 2013 BCMR Statement, we based our cost forecasts on the existing technology for TI services in the core.³⁰⁷ The delivery of leased lines services over BT's core network has traditionally been based on Synchronous Digital Hierarchy (SDH) technology. BT has over a number of years been developing 21st Century Network (21CN) technologies for its core network, including new 21CN SDH technology.³⁰⁸ We noted that some core traffic was delivered over 21CN SDH, but that this was on an ad hoc and very limited basis. We concluded that, although 21CN SDH technology may eventually be used to deliver TI leased lines services over the core of BT's network, we could not calculate robust cost estimates.³⁰⁹
- 6.92 We have decided to set charges for the next charge control period for TI services (terminating segments and services over the core³¹⁰) using the costs and asset values of the existing technology that is currently used to deliver these services.
- 6.93 For terminating segments, although TI is a relatively old technology, we have not identified a proven modern substitute which delivers the same service to the same level of quality to the same customer base. We consider that differences between TI terminating segment services and broadband, VPNs and Ethernet remain, as set out in Volume I, Section 5 and we have not identified any new potential substitutes.
- 6.94 For TI services delivered over the core, we understand that the traffic routed over BT's 21CN SDH continues to be (and will likely remain for the coming control period), on a limited and ad hoc basis. [3<].³¹¹
- 6.95 Due to the limited roll out of the 21CN SDH for TI services, establishing robust costs for the 21CN SDH assets is likely to be difficult. This means that, regardless of whether or not BT's 21CN could be considered to be the MEA for TI services delivered over the core, there are practical difficulties in implementing an MEA approach. We have therefore decided to base our charges on the existing technology.

We have decided not to implement a hypothetical on-going network adjustment

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- 6.96 We considered in the June 2015 LLCC Consultation whether it is appropriate to modify our cost forecasts to take account of the extent to which some of BT's assets

Statement.

³⁰⁷ Although we do not regulate or charge control services in the core network (defined as Tier 1 in the Annex 25), some of the costs are included in our model as they can affect the costs of regulated services, due to economies of scale and scope.

³⁰⁸ The delivery of leased lines services over BT's core network has traditionally been based on SDH technology. The development of 21CN technology (including the next generation of SDH technology) in the core is progressing and BT has migrated some internal services to be delivered over the 21CN core.

³⁰⁹ Paragraphs 19.113 to 19.116, March 2013 BCMR Statement.

³¹⁰ Although we only charge control TI terminating segments and not TI services in the core network, if the technology that is used to provide core network services is different and more efficient than the technology used to provide terminating segments, we may consider estimating the costs of the latter based on the newer technology. We therefore consider it relevant to review all technologies that are used to deliver TI services.

³¹¹ Question 2 and 3, BT response to the 4th s135 notice dated 6 November 2014.

relevant to TI services are heavily depreciated. Our considerations focused on the use of so-called ‘hypothetical on-going network’ (HON) adjustments. We did not consider that a HON adjustment was warranted in this case on the grounds that there were insufficient likely benefits given the significant costs to customers from adopting such a policy.

Stakeholder comments

- 6.97 Vodafone supported our proposed approach in relation to a HON adjustment. It noted that:

“We support Ofcom’s decision that no adjustment is needed for a declining market/depreciated assets (the ‘hypothetical on-going network’ adjustments). These adjustments are typically appropriate during a transition period from the legacy technology to a newer technology, helping to smooth the path of pricing over the period and ensure that customers face efficient migration signals. However, these adjustments are not appropriate in this case because BT isn’t investing in new technology to provide TI services and some customers are already migrating, albeit some are content to remain on TI services for some time to come. The only certain outcome from the inclusion of such an adjustment would be the inevitable over-recovery that occurs as a result of BT’s SMP.”³¹²

- 6.98 In its response to the June 2015 LLCC Consultation BT argued that we should apply a HON approach to its SDH transmission costs. BT proposed such an adjustment would involve the NRC³¹³ to GRC³¹⁴ ratio being increased to 50% and a 13 year depreciation life being applied to the assets.³¹⁵ It argued that this is consistent with the approach adopted in the latest WBA Charge Control.
- 6.99 In its response to the June 2015 LLCC Consultation BT argued that we should apply a HON approach to its SDH transmission costs. BT proposed such an adjustment would involve the NRC³¹⁶ to GRC³¹⁷ ratio being increased to 50% and a 13 year depreciation life being applied to the assets.³¹⁸ It argued that this is consistent with the approach adopted in the latest WBA Charge Control.

³¹² Paragraph 4.37 of Vodafone’s response to the June 2015 LLCC Consultation.

³¹³ i.e. Net Replacement Cost – the CCA equivalent of the HCA concept of Net Book Value. NRC represents the cost of replacing the asset with an asset of equivalent age. It can be derived as the GRC (explained below) less the accumulated (OCM) depreciation for the asset. NRC is explained further in Annex 26.

³¹⁴ i.e. Gross Replacement Cost – the CCA equivalent of the HCA concept of Gross Book Value. GRC represents the cost of replacing the asset with a new (undepreciated) asset. GRC is explained further in Annex 26.

³¹⁵ See Table 25 of BT’s response to the June 2015 LLCC Consultation.

³¹⁶ i.e. Net Replacement Cost – the CCA equivalent of the HCA concept of Net Book Value. NRC represents the cost of replacing the asset with an asset of equivalent age. It can be derived as the GRC (explained below) less the accumulated (OCM) depreciation for the asset. NRC is explained further in Annex 26.

³¹⁷ i.e. Gross Replacement Cost – the CCA equivalent of the HCA concept of Gross Book Value. GRC represents the cost of replacing the asset with a new (undepreciated) asset. GRC is explained further in Annex 26.

³¹⁸ See Table 25 of BT’s response to the June 2015 LLCC Consultation.

6.100 In arguing for a HON adjustment to be made BT claimed that:

- The use of a HON adjustment is not new in communication markets. BT argued that in the 2009 NCC, 2014 WBA and 2012 ISDN30 charge controls Ofcom adjusted the asset values and depreciation to “*reflect values of a HON*” in similar circumstances. BT further argued that this was to ensure that prices were not set too low to distort investment incentives in the market as customers migrated to newer technology.³¹⁹
- Inappropriately low pricing sends the wrong economic signals to the market.³²⁰ By pricing TI services below the forward-looking economic costs, investment in, and migration to, newer technologies such as Ethernet are adversely affected. It may also prolong the use of TI services and potentially delay the closure of TDM platforms.³²¹
- Depreciation for TI services based on accounting rules is too low compared with the economic value. BT claimed that “*[i]t is clear that the assets which are still in use should have an economic value so should have both an asset value and a depreciation*”.³²²
- Rejecting the use of a HON on the grounds that this would lead to the over-recovery of assets used to supply TI services places less value on seeking to set prices consistent with a competitive market and moves away from incentive regulation towards a rate of return regulation.³²³
- BT claimed that TI services have a high reported ROCE due to these services being at a late stage in the product life-cycle. The assets are approaching the end of their useful economic life and therefore appear as highly depreciated, with a low asset value and, in some cases having a lower depreciation charge due to assets being fully depreciated.³²⁴

6.101 BT’s response to the June 2015 LLCC Consultation was accompanied by two consultant reports:

- a report by DotEcon considering the profitability assessment for TI services, including the reliability of ROCE measures where assets are largely depreciated; and the impact of the June 2015 LLCC Consultation proposals on migration and investment incentives; and
- a report by Plum Consulting considering the impact of the June 2015 LLCC Consultation proposals on migration from TI services.

6.102 BT (supported by its consultants) further argued that by pricing TI services below the forward-looking economic costs, investment in, and migration to, newer technologies

³¹⁹ Paragraph 554 of BT’s response to the June 2015 LLCC Consultation.

³²⁰ Paragraph 545 of BT’s response to the June 2015 LLCC Consultation.

³²¹ Paragraph 555 and 556 of BT’s response to the June 2015 LLCC Consultation.

³²² Paragraph 550 of BT’s response to the June 2015 LLCC Consultation.

³²³ Paragraph 556 of BT’s response to the June 2015 LLCC Consultation. Conversely, in its report for BT, DotEcon (page 21) raises the possibility of under-recovery: “*If Ofcom does not make a HON adjustment (such as uplifting NRC to the steady state level) then BT may not be able to recoup the costs of investments it makes to replace legacy assets.*”

³²⁴ Paragraph 548 of BT’s response to the June 2015 LLCC Consultation.

such as Ethernet are adversely affected and it may also prolong the use of TI services and potentially delay the closure of TDM platforms.

Our conclusions

- 6.103 A number of the network assets, particularly transmission assets, BT uses to provide TI services are now relatively old and heavily depreciated. In Table 6.2 below we present the ratio of NRC to GRC for each of the asset types relevant to the TI basket. A NRC to GRC ratio of one implies that all the assets in use are new (i.e. have not incurred any depreciation). Conversely a ratio of zero implies that all the assets in use are fully depreciated. A ratio of around a half implies that the relevant group of assets are on average half way through their accounting life – Ofcom has previously found that rates above 40% are consistent with a steady state.³²⁵

Table 6.2: TI basket NRC to GRC ratios by asset type

Asset type	
Cable	[<]
Duct	[<]
Transmission	[<]
Land & Buildings	[<]
Computers & OM	[<]
Other Ntwk Eqpt	[<]
Other	[<]
Motor Transport	[<]
Intangibles	[<]
Total	[<]

Source: Ofcom adjusted 2014/15 base year costs

- 6.104 Based on our 2014/15 base year data the NRC to GRC across the TI basket is [<]. As BT notes in its response to the June 2015 LLCC Consultation, this NRC to GRC ratio is considerably below that which we might typically expect to observe for a market in a steady state. However, it is not inconsistent with what we might expect to observe under an accounting approach to depreciation for a service approaching the end of its life, using assets that are also likely reaching the end of their life.³²⁶
- 6.105 Consistent with our approach set out in the June 2015 LLCC Consultation, we have considered the relevance of the relatively heavily depreciated nature of certain asset types to the TI basket in setting this charge control. In particular we have considered whether it is appropriate to modify our cost forecasts to take account of the extent to

³²⁵ We explain this further in Section 7 of our June 2014 WBA statement, available at <http://stakeholders.ofcom.org.uk/consultations/review-wba-markets/statement/>

³²⁶ If the assets used to provide a declining service are unlikely to have been used to provide other on-going services, we might expect the firm to seek to manage its asset base in a manner that is consistent with the decline in demand over time. This might involve, for example, not investing in replacements for assets that are reaching the end of their life. This would involve the firm departing from the steady state NRC to GRC ratio because, by not replacing fully depreciated assets with new ones, the average age of the assets will increase over time.

which some of BT's assets relevant to TI services are heavily depreciated. In the paragraphs below we set out our conclusions in relation to:

- whether we should implement a so-called 'hypothetical on-going network' (or HON) adjustment when forecasting BT's efficiently incurred TI basket costs; and
- the reported profitability of TI basket services.³²⁷

6.106 For the reasons set out below we have decided not to make a HON adjustment for TI services in this charge control.

There are insufficient benefits to warrant making a HON adjustment

6.107 A HON adjustment would increase the firm's forecast capital costs to reflect those that would be faced by a firm operating a hypothetically on-going network. This typically involves adjusting the NRC of the firm's assets to reflect a ratio of NRC to GRC of around 50%, but can also involve adjustment to other aspects of the firm's capital costs. As a HON adjustment involves assuming higher costs than actually faced by the firm for the legacy technology, it might lead to customers paying charges in excess of those required by the firm to only recover its costs associated with the legacy technology.

6.108 The decision as to whether to apply a HON adjustment in any given control therefore involves regulatory judgment. This judgement involves weighing up whether there are any benefits associated with any improvement in customer migration incentives and/or the firm's incentives to invest in replacement technologies, and if so, whether these benefits outweigh the dis-benefits of setting higher charges than would necessarily otherwise be the case.

6.109 If we were to adopt BT's proposed adjustment to SDH transmission assets we would be requiring BT's customers to pay charges that are significantly higher than the expected costs of providing TI basket services over the control period.³²⁸ As BT itself notes in its response to the June Consultation "[t]he effect of making a "hypothetical ongoing network" (HON) adjustment is very significant".³²⁹ BT estimates³³⁰ the impact of its proposed HON approach on the final year (i.e. 2018/19) FAC for the TI basket to be around £10m.³³¹ This represents approximately 10% of the total TI basket final year FAC.

6.110 In the June 2015 LLCC Consultation we did not consider there to be sufficient benefits in this case to warrant adopting a HON adjustment.³³² Having considered stakeholders' responses and the available evidence, we have concluded that there

³²⁷ We do not, in general, respond to each of the points set out by BT's consultants in their reports. In our view, the reasoning why we do not agree with BT's proposals also responds to the points made in these consultancy reports in support of BT's arguments.

³²⁸ BT's proposed approach involves assuming that BT's costs associated with the assets are higher than BT would actually face over the charge control period, given its longstanding approach to depreciating these assets. This divergence arises from effectively disregarding a proportion of the depreciation that has accumulated on these assets over time. This accumulated depreciation will have been taken into consideration in setting historical charges.

³²⁹ Paragraph 553 of BT's response to the June 2015 LLCC Consultation.

³³⁰ See Table 25 of BT's Response to the June 2015 LLCC Consultation.

³³¹ Based on the June 2015 LLCC Consultation cost forecasting approach and model.

³³² June 2015 LLCC Consultation, paragraph 7.65

are insufficient countervailing benefits to justify requiring customers to pay such a significant increase in charges, as we explain below.

A HON adjustment is not required to manage a period of technological transition unlike in other controls

6.111 A HON adjustment may be appropriate in circumstances where the technology (and therefore assets) used to supply an on-going service is subject to change, but the charges for the control period are being set on the basis of the costs of the legacy technology. In such circumstances, it may be the firm has stopped investing in the legacy technology, but is investing in the new technology. This can result in the costs based on the legacy technology under-representing the costs that the firm would incur if it was to provide the on-going service using the legacy technology. In addition, by not reflecting in prices the firm's investment in the new technology, the firm's incentives to undertake such investment may be undermined. However, by adopting a HON adjustment to the legacy costs, the path of prices for the on-going service can be smoothed through the period of change, and where appropriate, ensure that customers face efficient migration signals and the firm has appropriate investment incentives.

6.112 Ofcom has typically considered HON adjustments in such circumstances, for example:

- Both of the last two WBA charge controls were set during a period of technology change. As we noted in the 2011 WBA charge control, the *"wholesale broadband market is in a state of flux"*.³³³ This period of technology change arose from BT rolling out 21CN technology to replace the incumbent 20CN technology to provide wholesale broadband services. During this period of change Ofcom adopted an anchor pricing approach in which the cost forecasting for WBA services was based on the 20CN costs.³³⁴ However, because for cost modelling purposes we excluded the costs associated with 21CN investment as well as any transition costs, we adopted a HON adjustment under which we assumed that all traffic would be carried on the 20CN network for the duration of the control, and that the level of capital and operating costs associated with the 21CN network were as if it were in an *"on-going environment"*.
- Similarly the NCC 2009 was set during a period of technological change. As we noted in the NCC 2009 Statement, *"[d]uring the next charge control period it is possible that there will be a major change in BT's network. BT will be moving its customers from the current PSTN to the new generation 21CN"*.³³⁵ As modelling the co-existence of the two platforms during the likely period of migration *"would require a very complicated methodology"*³³⁶ we adopted a *"cost model assuming a hypothetical ongoing network based on PSTN components"*.³³⁷

6.113 In this case however, although BT is likely to continue to provide TI services for a number of years (particularly 2Mbit/s services) albeit with declining demand, there is no new technology which is intended as a replacement for TI services. We have not

³³³ Ofcom, *Proposals for WBA charge control*, 20 January 2011, paragraph A7.2.

³³⁴ <http://stakeholders.ofcom.org.uk/binaries/consultations/823069/summary/condoc.pdf>

³³⁵ See paragraph A7.3 of Ofcom's 2011 WBA Charge Control Proposals, for example.

³³⁶ Paragraph 4.44. Ofcom's Review of BT network charge controls, 2009.

³³⁷ Paragraph 4.45, Ofcom's Review of BT network charge controls, 2009.

³³⁷ Paragraph 4.56, Ofcom's Review of BT network charge controls, 2009.

identified an MEA for TI and customers are migrating to a range of technologies, as well as ceasing their requirements altogether. We are unaware of any plans BT has to undertake significant investments in new transmission technologies for providing TI services.³³⁸ For example, although BT has undertaken a limited roll out of its newer 21CN SDH transmission equipment, “[<]”. BT did not provide any arguments or evidence in relation to such new investments in its response to the June 2015 LLCC Consultation. Therefore, we do not consider a HON adjustment is required to manage a period of technological transition.³³⁹

6.114 In response to BT, the use of a HON adjustment in prior controls does not mean it is necessarily appropriate in this case. As we noted in the ISDN30 charge control in 2012, the approach we adopted “*is not necessarily suitable for all services subject to charge controls...We will consider the particular circumstances of future charge controls when considering whether to make similar adjustments.*”³⁴⁰ For the reasons we have set out above, and based on the evidence available to us, we do not think a HON adjustment is appropriate in this case.

6.115 We note that our approach in this control is consistent with our approach in the 2013 BCMR Statement, in which we also decided against adopting a HON adjustment in relation to TI services. We explained that the uplift would “*overstate the costs of running the network*” and that “[<]”.³⁴¹

A HON adjustment is unlikely to have a significant enough impact on migration to warrant its adoption

6.116 As we set out in the June 2015 LLCC Consultation, a HON adjustment can sometimes be appropriate to support efficient migration from a legacy service to newer, more efficient services. Where there is a newer, lower cost alternative to a legacy service there may be efficiency savings associated with migrating customers of the legacy service on to the new service, particularly where providing both services simultaneously involves duplicating network assets. However, the benefits of using higher prices for legacy services to encourage such migration need to be weighed up against the welfare losses associated with setting charges for the legacy services customers above the costs of providing those services, particularly in circumstances where the legacy service has unique service characteristics that are valued by its customers. Furthermore, it may also be the case that other measures, such as reducing switching costs, may provide a more effective mechanism to encouraging migration.

6.117 We note that the relative path of prices for TI and Ethernet services over the control period implied by the values of X in this statement is materially different from the June 2015 LLCC Consultation (upon which BT and its consultants’ responses were based), and that we do not require (real) TI prices to fall over the control period as sharply as was proposed in the June 2015 LLCC Consultation.

³³⁸ Although BT is undertaking investment in Ethernet services, to which some of the TI service customers will likely migrate to over the control period, this increasing demand and investment is reflected in our cost forecasts upon which the Ethernet basket control is set.

³³⁹ We have outlined below why we do not consider that a HON adjustment is appropriate for the purposes of encouraging migration from TI to Ethernet services.

³⁴⁰ Paragraph 3.29, Ofcom’s 2012 Wholesale ISDN30 Price Control Statement.

³⁴¹ March 2013 BCMR Statement, paragraph 19.199

- 6.118 This means that the relative price of the basket of charge controlled Ethernet services will fall significantly faster than the charges for the basket of controlled TI services (primarily as the value of X for TI services is considerably less negative than we proposed in the June 2015 LLCC Consultation).
- 6.119 We agree with BT that changes in the relative price of TI services and alternative Ethernet services may have some impact on the rate of migration from TI services. However, in our view, the relevant consideration in relation to whether to adopt a HON adjustment is not whether there will be any effect, but rather whether there is likely to be sufficient effect to warrant requiring customers to pay higher prices for TI services. This consideration is also made in the context that, as set out above, our controls on TI and Ethernet services will result in Ethernet charges falling significantly faster than TI services over the control period.
- 6.120 For the reasons and evidence³⁴² set out below, we do not agree that sufficient effects on efficient migration and investment are likely to justify adopting a HON adjustment in this case. In particular, as set out in Volume I, migration away from 2Mbit/s TI services (and therefore towards Ethernet services in a number of cases) has been relatively insensitive to changes in the relative prices of TI 2Mbit/s and the relevant Ethernet services. Therefore, the impacts of adopting (or not adopting) a HON adjustment for BT's SDH transmission assets on Ethernet demand and investment appear limited.
- 6.121 Given that TI services are in decline, and the SDH transmission technology used to supply TI services is unlikely to be needed as an on-going network to support other new services that replace TI services,³⁴³ adopting the HON adjustment proposed by BT is unlikely, in our view, to generate an appropriate forward-looking estimate of BT's costs of providing TI services.³⁴⁴
- 6.122 In our view the adoption of a HON adjustment for TI services is unlikely to have a sufficiently large impact on efficient migration to warrant its adoption. This view is supported by the evidence on consumers' likely switching behaviour if TI prices were to increase as set out in Volume 1.³⁴⁵ Based on this evidence, we find that:
- EAD services are almost twice the price of TI services at 2Mbit/s, making switching in response to a small price change unlikely;
 - The rate of migration trend away from 2Mbit/s TI services has been fairly stable and insensitive to changes in the relative price of 2Mbit/s TI and the lowest priced of 10Mbit/s or 100Mbit/s Ethernet services;

³⁴² DotEcon argued (page v) that "Ofcom has not provided any evidence to back up its claim that the starting price adjustments and large reduction in X will have little effect on migration incentives". The evidence that supports our views in relation to migration incentives is set out below and is used in support of our market definition analysis. We note that DotEcon does not support its assertion that "Ofcom's position in this regard is implausible" with evidence.

³⁴³ As set out by Plum Consulting in its report for BT entitled "Leased line pricing in the context of "all-IP" transition".

³⁴⁴ We also note that simply adopting a HON adjustment in relation to the BT's accounting costs for SDH transmission assets, without other adjustments to how depreciation is calculated, is unlikely to generate an accurate estimate of the relevant "forward-looking economic costs" of providing TI services.

³⁴⁵ Section 4, Volume I

- In light of this it is the user's decision to migrate, and hence the overall amount of migration, reflects underlying changes in users' requirements such as the need for greater bandwidth;
- Users might be more likely to move from legacy TI services as part of an overall IT refresh, including the use of VoIP telephony or bandwidth upgrades; and
- There can be a number of switching costs associated with switching from TI to Ethernet leased lines. The impact of switching costs will vary by type of end user, but for end-users with large legacy networks or who use specialised applications, there are likely to be significant switching costs involved. Therefore, barriers to switching may be important in low bandwidth TI segments.³⁴⁶

The risk of inefficient investment without a HON adjustment appears to be relatively low

6.123 A HON adjustment may also be appropriate in circumstances where setting prices on the basis of the costs associated with heavily depreciated assets used to provide a declining service may risk giving rise to significant inefficient investment by the regulated firm. Such circumstances may arise where a significant reduction in charges may risk the absolute level of demand for a service increasing over the control period. In such a case, the firm may require additional legacy assets to meet the increased demand. The investment in these additional legacy assets is likely to be inefficient.

6.124 In our view the risks of such inefficient investment in this case appear to be relatively low. As set out in Annex 32 there is a strong consensus amongst the volume forecasts for TI services that demand will decline sharply over the 2016 control period. For example, we forecast (largely based on BT's forecasts) demand for 2Mbit/s TI local end services to decline by 29% per annum during the control period. A forecast of sharply declining demand for TI services is consistent with the trend observed over a number of recent years. This longer term trend away from TI services has been primarily driven by the migration to newer, alternative services including (but not limited to) Ethernet services. As we have set out above, the evidence collected for the BCMR implies that this migration away from TI services appears to have been insensitive to the relative price of 2Mbit/s TI and relevant Ethernet services. Other factors, such as the need for higher bandwidth, are likely to have been more significant. Therefore, the trend of declining TI volumes appears unlikely to materially change depending on whether or not a HON adjustment is applied to certain TI assets within the charge control.

6.125 We made a HON adjustment³⁴⁷ in the 2012 ISDN30 charge control as we were concerned about the risk of such inefficient investment that may arise from a charge control that was set without a HON adjustment. In our 2012 ISDN30 Statement we explained that setting prices without a HON adjustment would "*reduce prices significantly*" which could "*send the wrong price signals to users, leading to an increase in demand which could only be met by new investment*".³⁴⁸ As we have set out above, we do not think such a risk arises in this case.

³⁴⁶ Additionally we note that, in its report for BT, Plum Consulting (page 11) argues that switching costs, along with inertia, are the main barriers to migration away from TI circuits.

³⁴⁷ Otherwise referred to as a "steady state adjustment".

³⁴⁸ Ofcom, *Wholesale ISDN30 price control*, paragraph A3.56, 12 April 2012.

<http://stakeholders.ofcom.org.uk/binaries/consultations/isdn30-price-control/statement/isdn30-final->

- 6.126 On this basis, we consider that rejecting a HON adjustment in this charge control is unlikely to result in the absolute level of demand for TI services increasing over the control period.³⁴⁹ Indeed, it appears unlikely that it would have a particularly material impact on the path of relative demand given the evidence presented in the BCMR.
- 6.127 However, even in the unlikely event that the absolute level of demand does rise over the control period, it seems unlikely that BT would need to engage in material additional investment in SDH transmission. As we set out in Annex 32, BT has argued that it is difficult to remove SDH transmission assets from the network as demand declines for TI services. Information provided to Ofcom by BT implies that the SDH transmission equipment count has remained broadly stable over recent years, despite a substantial decline in demand for TI services. This implies that, should the TI demand decline start to reverse, BT should have sufficient spare capacity within its existing SDH transmission assets to meet that new demand, without having to undertake investment in new assets.

Changing our approach to depreciation at this stage risks leading to an over-recovery of costs without sufficient compensating economic benefits

- 6.128 BT argued that depreciation for TI services based on accounting rules is too low compared with the economic value. Furthermore, as also set out above, BT claimed that “[i]t is clear that the assets which are still in use should have an economic value so should have both an asset value and a depreciation”.
- 6.129 The depreciation charges included in BT’s FAC for the TI basket are based on an accounting approach to profiling depreciation over time, using assumed accounting lives for the assets in question. The asset lives implied from comparing the GRC and OCM depreciation attributed to TI assets appear to be considerably higher than the assumed accounting lives for certain asset types, including transmission (as BT highlights in its response).³⁵⁰ This difference between the accounting lives and the implied asset lives demonstrates that BT is using a number of assets, for example in relation to transmission, that are either heavily or fully depreciated to provide TI services. As we understand it, BT is likely to continue using these assets over the control period and, potentially significantly beyond.
- 6.130 It appears, therefore, that the assumed accounting lives used to depreciate these assets were less than the economic life that many of the assets will achieve and, in some cases, potentially significantly less. If the depreciation charges had been set based on a better (albeit with the benefit of hindsight) view of the economic life of the assets, then we would expect that the fully depreciated transmission assets still in use would now have a non-zero NRC value, and would continue to attract non-zero depreciation charges. In addition, heavily (but not fully) depreciated assets would likely have a higher current NRC value and lower depreciation charges now. However, the implication of these different values today is lower historic depreciation in the past, as the asset’s replacement cost would have been spread over a longer period of time.

[annexes1.pdf](#)

³⁴⁹ DotEcon appears to support such a view in its report for BT. On page 18 it notes that “Because of the underlying decline in demand for TI (20%), it seems unlikely that Ofcom’s proposals would provoke significant new demand (i.e. an increase in the quantities)”.

³⁵⁰ Paragraph 550 of BT’s response to the June 2015 LLCC Consultation.

- 6.131 As charges have historically been set to recover asset costs based on BT's assumed accounting lives (and depreciation profiles), switching to different depreciation charges now to reflect a different set of asset lives (and possibly depreciation profiles) risks leading to over-recovery of the costs associated with the assets. As set out above, it may be appropriate in some cases to risk such over-recovery if there are compensating economic benefits, but we do not consider that the evidence in this case supports the existence of sufficient economic benefits.
- 6.132 BT argued that rejecting the use of a HON adjustment on the grounds that this would lead to the over-recovery of assets used to supply TI services places less value on seeking to set prices consistent with a competitive market and moves away from incentive regulation towards a rate of return regulation. We disagree with BT:
- We do not accept that placing due emphasis on the potential for over-recovery by BT involves a move away from incentive regulation towards a rate of regulation. The adoption or otherwise of a HON adjustment does not undermine the primary incentives to pursue efficiency improvements present under a price cap approach to setting charge controls. Furthermore, in this case we do not consider there to be compelling evidence that a HON adjustment would result in materially more efficient investment and migration signals or incentives, as set out above.
 - Although in a competitive market we may expect firms to recover the costs associated with its assets with a time-profile that departs from an accounting approach, firms operating in a competitive market would not expect to over-recover the costs associated with the assets used to provide services, as BT's proposals would imply.
 - Given our duties to citizens and consumers, and the role of charge controls in preventing excessive pricing by BT, over-recovery of costs is a relevant consideration for a charge control. However, a balance needs to be struck with other relevant considerations as set out above.

The financial year 2014/15 is the base year in the 2016 LLCC Model

- 6.133 Section 5 sets out our consideration of stakeholder comments and reasoning for our decision to use 2014/15 for the base year in the 2016 LLCC Model.

We have made adjustments to BT's 2014/15 RFS

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- 6.134 We proposed adjustments to BT's RFS to form our base year costs.

Stakeholders' comments

- 6.135 Most of the respondents agreed in principle that BT's RFS needs to be adjusted. Their comments were conflicting as to the level of these adjustments. In particular, we received a number of responses to our proposals related to the Cost Attribution Review. We set out the responses relating to the level of these adjustments in detail in Annexes 27 and 28.

Our conclusions

6.136 As noted in Section 5, our starting position for the base year costs is based on BT's audited RFS for 2014/15. Openreach has provided us with a detailed disaggregation of costs from the RFS.

6.137 We have scrutinised the base year data provided by BT following a set of criteria as identified in Annex 27. First, we have established that BT has adopted our proposed adjustments in relation to Access Cards, June 2015 CAR Errors, RAV, Credit Notes,³⁵¹ Cumulo³⁵² and TI Volumes. Therefore, it was not necessary to make any further adjustments in relation to these costs as they were already reflected in the 2014/15 RFS. Second, we have identified the following adjustments to the 2014/15 base year data:

- **Error in 2014/15 RFS:** We have removed the costs relating to BT's error in the accounting of CPE Switch.
- **EE Acquisition costs:** We have removed the costs relating to BT's acquisition of EE;
- **Base year adjustments informed by CAR:** We have made adjustments to reflect that analysis.³⁵³ We set out our decisions on the adjustments in Annex 28;
- **Restructuring costs:** We have excluded the costs relating to one-off restructuring charges; and
- **Property Rationalisation provision:** We have smoothed the costs relating to Property Rationalisation provision.

6.138 Table 6.3 below presents a summary of the impact of our adjustments on the reported 2014/15 data.

Table 6.3: Summary of adjustments made to TI base year costs

	Impact on TI services FAC (£'m)
2014/15 RFS Total	268.9
Error in 2014/15 RFS	(1.3)
EE Acquisition costs	(0.7)
Cost Attribution Review ³⁵⁴	(6.9)

³⁵¹ BT agreed in principle with the correction of the Credit Note error but said that Ofcom has incorrectly removed these costs from the base year. We have reviewed the 2014/15 RFS and agree with BT. We have corrected the error in the base year costs accordingly. See Annex 27.

³⁵² As noted in Section 5, BT has not strictly followed our proposed adjustment in relation to Cumulo. As a result the Cumulo costs in the base year data have been understated with [X] in the Ethernet basket and overstated with [X] in the TI basket. Given that this impact is not significant, we have decided not to make any further adjustment in the 2016 Base Year Model related to Cumulo

³⁵³ We have made adjustments to costs relating to: Fibre costs, Duct costs, Openreach and TSO Software costs, Electricity costs, Property costs and General Overheads.

³⁵⁴ See Annex 28.

Restructuring costs	(0.7)
Property Rationalisation provision	(0.4)
2014/15 Revised Total	258.9

Source: Ofcom

6.139 Our analysis and justification in relation to the above adjustments is set out in Annex 27 and 28.

Stage 3: Forecast costs for the duration of the charge control

6.140 Having modelled the relevant base year costs under Stage 2, we forecast (from this starting point) how costs are likely to change over the duration of the charge control. In the paragraphs below we summarise our decisions in relation to volume and efficiency changes, AVEs and CVEs, input price inflation changes and the cost of capital and the impact of imposing other remedies given that they are specific to TI services.

We forecast continued TI volume decline until 2018/19

June 2015 LLCC Consultation

6.141 We proposed to forecast continued TI volume decline until 2018/19.

Stakeholder comments

6.142 BT agreed with Ofcom's forecasts for TI volumes. It said that Ofcom's forecast decline of TI local ends is consistent with BT's plans to close the platform that supports sub 2Mbit/s circuits in 2020 and this is reflected in the faster decline of sub 2Mbit/s services compared with that of 2Mbit/s services. BT also stated that the volume decline is also substantial for mobile backhaul services, as mobile operators' bandwidth requirements grow and as Ethernet is more cost effective at higher bandwidths. Also, BT noted that other PPC volumes continue to decline as customers migrate to alternative, frequently lower-priced, services.

6.143 Vodafone suggested that Ofcom may have overstated the decline in TI services migrating to Ethernet. It said that, due to a number of reasons, it believes TI volumes will hold up more than Ofcom has anticipated. [355]. It says that migration would only start once a definitive statement on platform closure was received, which is likely to be some way off, pushing scale migration to 2017 or beyond. Also, Vodafone has a practical concern that BT would not be able to resource any large scale TI migration "until the service crisis was brought under control". Vodafone suggests that in the absence of an error correction mechanism, the assumptions should be sanity-checked against both customer expectations and BT's ability to resource a scale migration.³⁵⁵

Our conclusions

6.144 BT's TI services consist of a number of different products (e.g. PPCs, RBS, infrastructure etc.), bandwidths and charging elements (e.g. local ends, distribution/transmission, links and elements currently known as regional trunk). Our

³⁵⁵ [355].

2016 LLCC Model requires forecasts for each product and element, including those we do not directly charge control, e.g. services above 8Mbit/s. This is because the costs for controlled services may also depend on the demand for non-controlled services due to the presence of economies of scale and scope in the provision of leased lines.

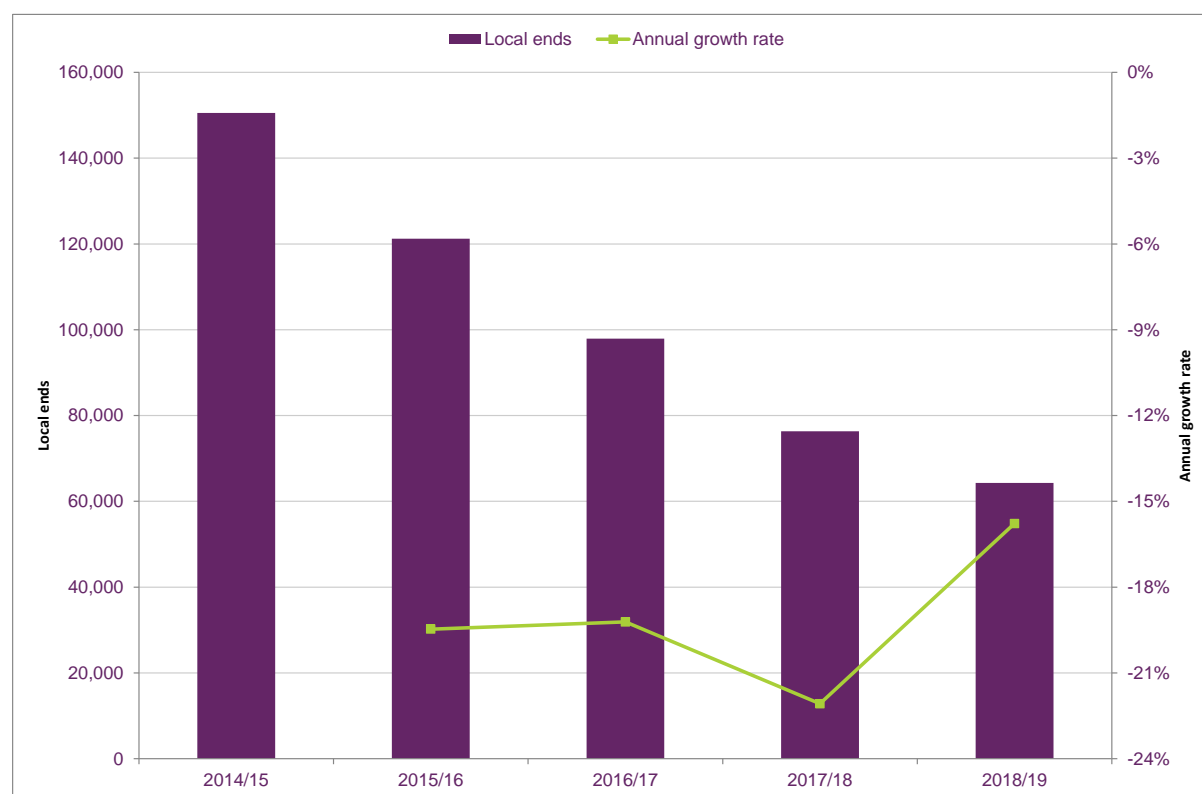
- 6.145 We have gathered volume forecasts for the charge control period from BT as well as OCPs and an industry analyst. The trends all forecast continued decline up to 2018/19, with some variation in relation to the speed of decline over the period. On balance, we consider that it is reasonable to primarily use BT's forecasts (further details are provided in Annex 32).
- 6.146 As we discuss in Volume I, we expect there will be three main drivers of the declining volumes in the TI market over the next charge control period:³⁵⁶
- BT has signalled to end-users that it is ending support for the PDH platform that supports sub-2Mbit/s services due to obsolescence of the equipment;
 - a large number of TI users are increasing their bandwidths above 10Mbit/s or higher, where Ethernet is the cheaper technology; and
 - the availability of NGA broadband and EFM services to support higher upload and download speeds using Wholesale Local Access remedies (i.e. LLU and VULA) continues to increase.³⁵⁷
- 6.147 As a consequence, many, though not all, customers are expected to migrate from TI to higher bandwidth services delivered using Ethernet, including EFM, and other technologies, with the Ethernet forecasts supporting this view of growth in high bandwidth services over the next charge control period.
- 6.148 However, it is likely a significant proportion of customers will remain on TI services over the charge control period, particularly those with large legacy networks and/or specialised requirements as there are likely to be significant switching costs involved.³⁵⁸
- 6.149 By the end of this charge control, we forecast the total number of TI circuits to decline by around 57% compared to 2014/15, equivalent to a decline of around 19% per annum as shown in Figure 6.2 below. Further details on our volume forecasting analysis for TI services are set out in Annex 32.

³⁵⁶ See Section 5, Volume I.

³⁵⁷ Paragraph 5.20, May 2015 BCMR Consultation.

³⁵⁸ See Section 5, Volume I.

Figure 6.2: Ofcom forecast of TI local ends (installed base and annual growth rate)



Source: Ofcom analysis

Figure 6.3: Ofcom forecast of TI local ends (installed base by bandwidth)



Source: Ofcom forecast

We have adopted an efficiency assumption of 4.5% for operating costs of TI services

June and November 2015 LLCC Consultations

6.150 In the June 2015 LLCC Consultation we proposed an efficiency assumption of 4% to 7%, with a central estimate of 5% per annum for TI services. In our November 2015 LLCC Consultation we proposed changing the efficiency assumption range to 2% to 6% in light of new analysis of BT's TSO³⁵⁹ management accounting data which we suggested might have a large impact on our analysis of the TI efficiency assumptions.

Stakeholder comments

6.151 As set out in Section 5, a number of stakeholders provided substantial responses to our proposed efficiency assumptions, including our revised proposals set out in the November 2015 LLCC Consultation. We set out the responses in detail in Annex 29.

Our conclusions

6.152 Having taken account of stakeholder responses and more recent data, we have adopted an efficiency target of 4.5% per annum for TI services for operating costs.³⁶⁰ We make no assumption about efficiency on capex for TI services as there is no capital expenditure for TI services in the 2016 LLCC Model. A detailed discussion of our methodology and assumptions is provided in Annex 29.

We have adopted base year elasticities derived from BT's LRIC model

6.153 Section 5 sets out our consideration of stakeholder comments and reasoning for our decision to estimate our base year AVEs and CVEs using Ofcom-calculated LRIC to FAC ratios. We have decided to apply the same approach to the components in the TI basket. A more detailed discussion of our methodology and estimated elasticities is provided in Annex 32.

TI cost modelling changes

6.154 In response to the June 2015 and November 2015 consultations, BT provided substantial comments on our modelling of TI basket costs. As set out below, BT's overriding concern was that in practice it would not be possible for it to achieve the volume-driven cost reductions modelled by Ofcom. Having carefully considered these arguments, we have made a number of modelling changes that have the effect of moderating the forecast cost reductions:

- we have forecast the asset costs for TI services by disaggregating component costs into asset types;
- we have adopted a dynamic elasticities approach; and

³⁵⁹ BT Technology, Services and Operations is an internal service unit responsible for delivering and operating BT's networks, platforms and IT systems.

³⁶⁰ We make no assumption about efficiency on capex for TI services as there is no capital expenditure for TI services in the 2016 LLCC Model.

- we have revised our forecasting approach for transmission and accommodation costs so costs reduce less steeply as volumes decline.

6.155 Below, we set out our reasons for implementing these modelling changes.

We have forecast the asset costs for TI services by disaggregating component costs into asset types

November 2015 LLCC Consultation

6.156 In the November 2015 LLCC Consultation, we proposed to forecast BT's TI capital costs by splitting the TI components into their constituent asset types. We explained that this more complex and detailed approach was a departure from our typical top-down approach to forecasting BT's costs, but that we considered it was warranted in light of the apparent risk to forecast accuracy associated with averaging errors for TI services. We did not consider the risks in relation to TI operating costs to be as significant and therefore proposed to adopt our typical modelling approach (i.e. forecasting costs at the component level) for these costs.

Stakeholders' comments

6.157 BT was the only respondent.³⁶¹ It argued that "*Ofcom proposes for the TI basket only, to make an adjustment to the modelling of capital costs to reflect the potential averaging errors that could arise from a change in the TI asset mix over the control period. BT agrees with this approach for TI services. This is a better way to model TI capital costs given the diverse mix of assets and the substantial reduction in TI volumes over time.*"³⁶²

Our conclusions

6.158 We have concluded that it is appropriate given the circumstances of this control to forecast TI capital costs by forecasting separately each asset type for each component. We have, however, retained our typical forecasting approach for TI operating costs (i.e. we forecast them at the component level). This approach is consistent with that proposed in the November 2015 LLCC Consultation.

6.159 Ofcom's typical top-down approach to forecasting costs for BT's charge controlled services is to forecast costs at the component level. Where components reflect a mix of inputs that respond differently to volume changes (i.e. have different underlying elasticities), and where volumes are expected to change over time, forecasting at the component level can give rise to averaging errors. These errors arise because as volumes change the mix of the various costs will change reflecting the various underlying input elasticities. However, this mix change would not be reflected in the single weighted average component elasticity.³⁶³

³⁶¹ Vodafone responded to our proposed changes to the TI modelling but its comments related to our assessment of whether such an approach would also be appropriate for Ethernet services. We deal with these comments in Volume II, Section 5.

³⁶² BT response to the November 2015 LLCC Consultation, paragraph 52.

³⁶³ As demonstrated by the example set out in paragraphs 5.53 to 5.57 of the November 2015 LLCC Consultation.

- 6.160 Where volumes are declining significantly, the importance of the relatively inelastic inputs for the component will grow, implying costs will reduce less than would be implied by the weighted average component elasticity measured at the start of the control period. As such, forecasting at the component level could lead to a cost forecast that is lower than if the mix of inputs into the component is reflected in the cost forecasting.
- 6.161 Increasing the level of detail at which the cost forecasts are derived increases the level of complexity of the forecasting process which may reduce transparency for stakeholders. Furthermore, by applying our typical forecasting approach consistently across controls, we might expect some of the potential forecast inaccuracies to cancel each other out over time. Departing from the typical approach may therefore disrupt this process of inaccuracies being balanced out. The benefits of potentially increased forecast accuracy (which may in some cases be spurious), therefore need to be weighed up against such costs associated with more complex modelling.
- 6.162 We consider that the circumstances surrounding the TI basket in this control period imply that the benefits associated with improved forecasting accuracy outweigh the potential costs of adopting a more granular forecasting approach. In particular, we consider that there are a number of factors that imply the risks to forecasting accuracy are particularly significant in this case, as we set out in the November 2015 LLCC Consultation:
- TI services consume a broad range of assets and there is considerable variation in the responsiveness of these different assets to changes in volumes (i.e. the underlying volume elasticities vary considerably);³⁶⁴
 - individual TI components appear to often be associated with a range of different asset types that can have highly divergent underlying volume elasticities; and
 - the forecast decline in TI volumes is particularly significant.
- 6.163 Therefore, we consider it appropriate to depart from our typical (component level) modelling approach in respect of forecasting TI capital costs and have modelled TI costs by disaggregating the capital costs for each of the TI components into their various constituent asset types.
- 6.164 We have only increased the modelling complexity for the TI capital costs and not TI operating costs, consistent with our November 2015 LLCC Consultation proposals. We consider the risks to forecasting accuracy for TI operating costs from forecasting at the component level to be considerably less than for capital costs because there appears to be relatively little variation in the elasticities of the key operating cost sectors compared to asset types. As we demonstrated in Tables 5.7 and 5.8 of the November 2015 LLCC Consultation, the AVEs for the various individual asset types of relevance for the eight largest TI components in 2013/14 ranged from [X] for Duct to [X] for Transmission, but the pay CVEs only ranged from [X] to [X] and the non-pay CVEs only ranged from [X] to [X] for the important cost sectors.

³⁶⁴ As demonstrated by Table 5.8 of the November 2015 LLCC Consultation.

We have adopted a dynamic elasticities approach

November 2015 LLCC Consultation

6.165 In the November 2015 LLCC Consultation, for the TI basket we proposed to adopt dynamic CVEs and AVEs that adapt to the changing mix of incremental and fixed and common costs over the control period. We considered that this approach would be more consistent with our conceptual top-down modelling approach which assumes that the level of fixed and common costs recovered from charge control services in the base year will remain constant (save for inflation and efficiency improvements) over the control period.

Stakeholders' comments

6.166 Three stakeholders commented on our proposed approach to elasticities that adapt to the mix of common and incremental costs over the control period. Two stakeholders, BT and Virgin Media were supportive of our proposed approach:

- BT set out that it agrees with Ofcom's modelling approach and that the approach "is important as it explicitly recognises fixed common cost will amount to a varying proportion of total costs as volumes change, contrary to the variable cost (i.e. total cost less fixed common cost) which is dependent on volume changes and the operation of the AVEs".³⁶⁵
- Virgin Media set out that "due to the extent of volume changes in [sic] during the control period, particularly related to the TI basket, we agree with the use of dynamic AVEs...".³⁶⁶

6.167 Vodafone said that while it accepts that using dynamic AVEs can be a more sensible approach to services that are expected to experience significant volume changes within a control period, it believes the framework itself needs to be reconsidered to better reflect prices that would be achieved within a competitive market. In this regard, Vodafone set out that:

*"Given where TISBO is in the product lifecycle, applying CVEs and AVEs does not reflect the long run level of costs, but simply reflect [sic] changes in the utilisation of the network as demand falls. Ofcom should instead set its cost forecasts based on the base year costs, and the efficiency and inflation elements."*³⁶⁷

Our conclusions

6.168 Under Ofcom's top-down modelling approach, we start with BT's existing allocation of costs to those services (i.e. BT's CCA FAC data) for the base year of the control. Using BT's CCA FAC data as the starting point for considering cost recovery does not guarantee that all of BT's common costs are recoverable, but it does mean that a share of common costs is taken into account when setting regulated charges. A share of the common costs will also be left for BT to recover in unregulated markets.

³⁶⁵ BT response to November 2015 LLCC Consultation, paragraphs 46-47.

³⁶⁶ Virgin Media response to November 2015 LLCC Consultation, p.2.

³⁶⁷ Vodafone response to November 2015 LLCC Consultation, p.13.

- 6.169 The fixed and common costs that are recovered from the charge control services in the base year are then assumed to remain constant (save for inflation and efficiency improvements) over the control period, regardless of volume changes. If applied consistently across markets and time, our treatment of fixed and common costs can be consistent with the 'fair bet' approach as they are taken into account in one or another of our charge controls, with no bias to under or over recovery of costs.
- 6.170 In practice, when forecasting costs we typically make the simplifying assumption that the elasticities (CVEs and AVEs) measured in the base year remain constant over the control period. In cases where volume changes are limited, this simplifying assumption is likely to be reasonable. However, where volume changes are significant, assuming that the elasticities are constant may be inconsistent with our assumption that fixed and common costs remain constant. This is because the underlying mix of incremental costs and fixed and common costs, which the elasticities reflect, will change as volumes change significantly. In light of this, we consider that an approach based on dynamic CVEs and AVEs that adapt to the changing mix of incremental and fixed and common costs over the control period may be appropriate where volumes changes are significant.
- 6.171 Stakeholders were broadly in agreement that the large volume movements forecast for TI services over the control period warranted an adjustment to the standard approach. We have therefore maintained our November 2015 Consultation position and have used dynamic CVEs and AVEs to forecast TI basket costs. We have taken into consideration Vodafone's broader concerns on the framework used to forecast TI costs in paragraphs 6.80 to 6.85. As set out in Volume II Section 5, we have adopted a consistent approach for the Ethernet basket, recognising that there are significant changes in volumes forecast (albeit to a lesser extent and in the opposite direction to TI services).

We have revised our forecasting approach for transmission and accommodation costs so costs reduce less steeply as volumes decline

June 2015 LLCC Consultation

- 6.172 In the June 2015 LLCC Consultation, we proposed to depart from the typical top-down modelling approach by changing how we value the assets we forecast BT would need to dispose of in response to volume declines (i.e. additional disposals).³⁶⁸ This change was necessitated by the particularly sharp volume reductions forecast for TI services over the 2016 LLCC control period. Recognising that the assumption that BT will respond to volume declines by disposing of new assets is not likely to be realistic, we proposed to value additional disposals on the basis of the average age of its assets. This approach results in the value of the capital employed in the controlled services declining at a slower rate when volumes decline as compared to Ofcom's typical modelling approach. We did not propose to make any other adjustments to our standard modelling approach to forecast TI basket costs.

Stakeholder comments

- 6.173 BT argued that Ofcom's asset disposals approach is unrealistic:

³⁶⁸ Disposing of assets can either be through selling on a secondary market or redeploying to alternative uses within the business.

*“What Ofcom is suggesting is that BT undergoes a continuous network rationalisation to minimise the network equipment deployed, without considering the practicality or the cost of such an approach. In reality this would require significant network planning effort to implement, would cause service disruption to customers, and would involve the cost of reconfiguring the network and rearranging circuits.”*³⁶⁹

- 6.174 BT expressed specific concerns about the modelling of transmission and accommodation costs where it considers it highly unlikely that it will be economic for such assets to be separated from the network and sold (as assumed by Ofcom).³⁷⁰ BT argued that the LRIC approach is unrealistic where BT has a complex network designed to deliver the aggregate service volumes in prior periods and where it is complex, challenging and costly to reconfigure the network as volumes decline. Hence in practice, reductions in transmission equipment (and associated accommodation) lag behind volume changes resulting in “sticky downwards” costs.³⁷¹
- 6.175 To support its views, BT submitted analysis that compared Ofcom’s June 2015 LLCC Consultation forecast of 2014/15 TI basket costs with the 2014/15 outturns reported in the RFS. BT argued that this analysis indicates that Ofcom’s modelling approach results in TI costs being under-forecast and hence is unrealistic.³⁷² In addition, in its response to the November 2015 LLCC Consultation, BT provided information showing that SDH equipment volumes have remained flat during the last four years despite the decrease in TI service volumes. BT also provided information on the share of SDH network costs allocated to TI, voice and broadband services, arguing that the scope for redeployment is limited by the fact that the other services using the SDH network (voice and broadband) are also in decline.³⁷³
- 6.176 BT proposed the use of an AVE of 0.13 for transmission assets on the basis of its plans to reduce the number of SDH network structures by around 2.5% per annum up to 2018/19 and an assumed decline in TI service volumes of around 20% per annum. BT argued that accommodation costs cannot be reduced by as much as transmission equipment as floor space can only be cleared and made available for re-use when a whole suite of equipment becomes unused. On this basis, BT suggested that 0.13 (as calculated for SDH equipment) should be considered as an upper limit for the CVE used for accommodation costs.³⁷⁴
- 6.177 In relation to the modelling of duct and fibre costs, BT stated that Ofcom’s asset disposals approach may be more relevant.³⁷⁵ However, BT also thought that the approach may be over-optimistic as it may not be possible to re-use these assets in all cases. BT suggested that the duct and fibre “asset disposal” factor is moderated by a factor of one-half to take this into account.³⁷⁶

³⁶⁹ BT response to June 2015 LLCC Consultation, paragraph 33.

³⁷⁰ BT response to November 2015 LLCC Consultation, paragraph 49.

³⁷¹ BT response to November 2015 LLCC Consultation, paragraphs 102-103.

³⁷² BT submission supporting the data provided to Ofcom in meetings held on 5 October 2015, received on 23 October 2015.

³⁷³ BT response to November 2015 LLCC Consultation, paragraphs 104-109.

³⁷⁴ BT response to November 2015 LLCC Consultation, paragraphs 110-111.

³⁷⁵ BT response to November 2015 LLCC Consultation, paragraph 50.

³⁷⁶ BT response to November 2015 LLCC Consultation, paragraphs 113-115.

Our conclusions

- 6.178 An important consideration when we set charge controls is to ensure that our charge control design and forecasts are consistent with giving BT an opportunity to recover its efficiently incurred costs. We recognise that in certain circumstances, such as when volumes are in sharp decline, there can be the risk that our standard modelling approach does not generate forecasts that are consistent with giving BT this opportunity. In such circumstances, departures from the standard approach may be warranted.
- 6.179 In the June 2015 LLCC Consultation, we identified such a set of circumstances for TI basket services, where we have forecast a significant decline in volumes over the control period. In light of this, we proposed departing from the standard modelling approach in relation to how we value additional disposals. Recognising that the assumption that BT will respond to volume declines by disposing of new assets is not likely to be realistic, we proposed to value additional disposals on the basis of the average age of its assets. The proposed approach to additional disposals results in the value of the capital employed in the controlled services declining at a slower rate when volumes decline as compared to Ofcom's typical modelling approach.
- 6.180 In addition, as detailed elsewhere in this section we make a number of additional changes that further moderate the extent to which TI basket costs are forecast to decline throughout the control period (for example, dynamic elasticities, modelling at the level of asset types). To illustrate, Table 6.4 below shows the NRC costs reported in the 2014/15 RFS, alongside our forecasts of NRC costs in 2014/15 in the June 2015 LLCC Consultation and the November 2015 Consultation.

Table 6.4: Comparison of Ofcom forecasts of 2014/15 NRC with historical NRC reported in 2014/15 RFS for the four largest asset types (£m)

	2014/15 RFS Outturn	2014/15 Ofcom forecast: Jun 2015	2014/15 Ofcom forecast: Nov 2015
Cable	[X]	[X]	[X]
Duct	[X]	[X]	[X]
Transmission	[X]	[X]	[X]
Land & Buildings	[X]	[X]	[X]

- 6.181 Table 6.4 shows that the modelling approach in the June 2015 LLCC Consultation significantly underforecast TI costs as reported in the 2014/15 RFS. By contrast, the modelling changes we proposed in the November 2015 LLCC Consultation³⁷⁷ result in a forecast of 2014/15 Net Replacement Costs (NRC) that is higher than the forecast in the June 2015 LLCC Consultation and closer to the outturn NRC reported in the 2014/15 RFS. As set out in the November 2015 LLCC Consultation, in our charge control modelling we do not seek to forecast the outcome of BT's RFS. For any particular year, there may be a number of reasons that are unrelated to the accuracy of the modelling why our modelled forecasts of costs differ from the costs reported in the RFS.³⁷⁸ Nevertheless, we consider that the directional impact on the

³⁷⁷ The modelling changes proposed in the November 2015 LLCC Consultation include the use of dynamic elasticities and modelling at the level of asset type.

³⁷⁸ For example, some costs are volatile from year to year (e.g. net current assets), while BT could change the accounting approaches it uses or the data sources it relies upon across time.

NRC of the main asset types as shown in Table 6.4 indicates that the modelling changes we proposed in the November 2015 Consultation result in a more accurate cost forecast and hence go some way to addressing BT's concerns.

6.182 However, having considered BT's submissions on the specific treatment of transmission and accommodation costs, we consider that additional adjustments are necessary to ensure that BT has the opportunity to recover its efficiently incurred costs over the control period. Below, we detail the evidence provided by BT and set out our reasons for further departing from our standard modelling approach for these costs.

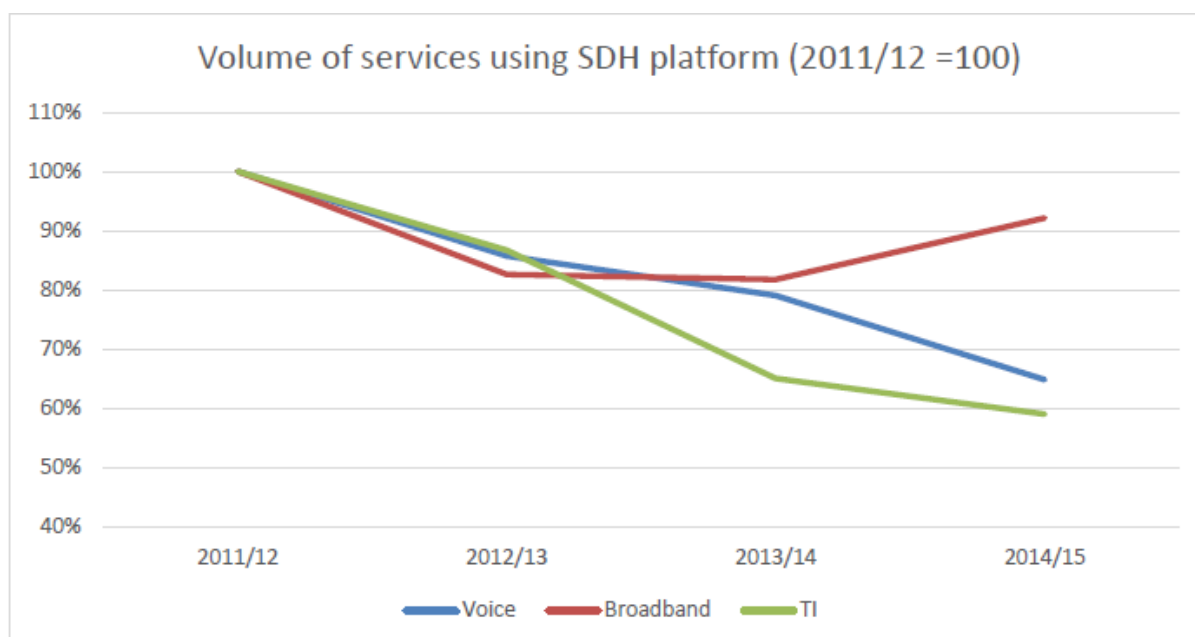
6.183 BT's argument is centred on its ability to respond to declines in TI service volumes by disposing of its transmission assets and associated accommodation assets and operating costs. We agree with BT that it is informative to consider this issue by looking at the trend in transmission assets over the last few years. Our understanding is that accommodation costs are mainly comprised of the rack space within exchanges that house transmission equipment. Hence, we consider that inferences about both transmission and accommodation costs can be made from the volume of transmission equipment being used by TI services. Table 6.5 below sets out the information BT supplied on SDH equipment count and power usage between 2011/12 and 2014/15.

Table 6.5: PPC volumes and SDH equipment volumes and associated power consumption (BT response to November 2015 Consultation, Table 9)

	2011/12	2012/13	2013/14	2014/15
TI volume (2Mbit local ends)	[X]	[X]	[X]	[X]
Equipment count (SDH muxes)	[X]	[X]	[X]	[X]
Power usage (GWH)	[X]	[X]	[X]	[X]

6.184 Table 6.5 shows that TI service volumes, measured in terms of 2Mbit/s local ends, decreased by approximately 40% over the four year period, whereas the number of SDH muxes in the network and amount of power usage remained relatively flat. We understand that the equipment count will also be driven by the voice and broadband services that also use the SDH network. As Figure 6.4 below shows, the volumes of voice and broadband services using the SDH network have also decreased over this period (albeit at different rates).

Figure 6.4: Relative volumes of voice, broadband and PPCs over the same period (BT response to November 2015 Consultation, Figure 3)



- 6.185 Taken together, this information indicates that BT did not reduce the scale of its transmission network between 2011/12 and 2014/15 in response to the decline in service volumes (across TI, voice and broadband services). Looking ahead to our forecasting period, we note that TI service volumes are projected to decrease at a similar rate.³⁷⁹ However, in contrast to the historical trend in transmission assets, the modelling approach we consulted on in November 2015 forecasts a significant reduction in the transmission assets used by TI services over the forecasting period.³⁸⁰ As such, there appears to be a disconnect between the level of SDH transmission cost reductions BT has achieved in the past, and the reductions our model forecasts it will achieve in the future.
- 6.186 In light of this, we have considered why our modelled forecasts might differ from actual outcomes for TI transmission and accommodation costs. In setting charge controls, our standard approach is to forecast how changes in volumes will affect BT's costs in the long run (i.e. a 'long-run approach'). Specifically, we forecast costs using AVEs and CVEs which are based on a LRIC relationship between costs and volumes. This approach deliberately abstracts from short term lumpiness in costs and makes an explicit assumption that network assets can be rationalised as volumes reduce. We recognise that in some instances this can act to BT's advantage (e.g. where BT's actual costs are lower than forecasts), while in others it can act to its disadvantage. However, generally speaking, if applied consistently across charge controls this approach can ensure that there is no bias to under or over recovery of BT's costs.
- 6.187 In the case of TI services, the use of the 'long-run approach' assumes that BT can quickly respond to volume declines by removing its transmission and accommodation

³⁷⁹ For example, PC rental local end fibre volumes are predicted to decrease by around [X] between 2015/16 and 2018/19.

³⁸⁰ For example, the November 2015 LLCC model forecast the NRC of transmission for the CH371: OR PC rentals 2Mbit/s distribution component, to reduce on average by [X] per annum until the end of the control.

assets as it moves from its current network specification to a smaller more efficient network specification. The AVE for transmission assets derived from the 2014/15 LRIC model of around [£<], coupled with a forecast decrease in TI volumes of more than [£<] over the forecasting period, implies a very significant reduction in the size of BT's SDH transmission network over the forecasting period.

6.188 While it may be possible for BT to rationalise its SDH network, by, for example, reconfiguring the circuits it provides (i.e. concentrating existing circuits on to underutilised muxes), this is likely to take a significant period of time and result in costs. In particular, such a network rationalisation programme:

- Would likely be a costly exercise as engineers would be required to reconfigure the routing of circuits within the SDH network. These costs may be particularly high if the network rationalisation is carried out on an ongoing basis.
- May involve service outages for customers as circuits are switched between muxes. Such outages may result in BT needing to give penalty payments to its customers.
- Is dependent on there being under-utilised assets where remaining demand is located. Demand for TI circuits is geographically dispersed so this may not be the case in every exchange where SDH muxes are located.
- May give rise to holding losses. Where freed up assets are not fully depreciated and do not have an alternative use, BT would incur holding losses.

6.189 In our view, if we were to adopt a cost forecast that assumes a large amount of additional disposals for transmission and accommodation assets (as assumed in our standard approach) it would be appropriate to include an allowance for the costs of transitioning to a smaller SDH network listed above.

6.190 However, it is likely to be difficult to estimate a suitable allowance due to uncertainty about the scale of the network reduction required, the timing of such a programme and the magnitude of the holding losses. As BT has set out, it has no plans to carry out such a programme (its current intention is to reduce the size of the SDH network by a maximum of 2.5% per year). Therefore, recognising the practical difficulties of implementing the standard approach with a transition cost allowance, we have decided to adopt an alternative approach that assumes that BT will largely retain its current SDH network over the forecasting period. Specifically, we have adopted an approach for TI transmission and accommodation assets that assumes that:

- BT will not make any additional disposals in response to volume reductions; and
- BT will dispose the assets that reach the end of their economic life and not replace them by investing in steady state capital expenditure.

6.191 We consider that this approach to modelling transmission and accommodation assets is a pragmatic way of ensuring that BT can recover its efficiently incurred costs, while it does not remove the incentive for BT to implement a cost rationalisation programme if it is efficient to do so. In addition, we note that the assumption that BT will not invest any steady state capital expenditure has the effect of increasing the average age of BT's transmission and accommodation assets, but do not consider this to be an unrealistic scenario in a declining market.

- 6.192 BT's operating costs for accommodation have relatively high LRIC to FAC ratios which implies that BT's TI accommodation costs are highly variable with volumes. This would be inconsistent with our revised treatment of transmission asset costs. We have therefore also concluded that it is appropriate to revise our treatment of BT's TI accommodation costs. We have assumed a less aggressive reduction in TI accommodation operating costs by adopting a lower CVE of 0.21 for accommodation costs. As detailed in Annex 32, this figure has been derived using BT's estimate of 0.13 for exchange-based transmission and accommodation costs and information we have gathered on the split between exchange, office space and electricity costs within the accommodation cost category.
- 6.193 In relation to BT's concerns on the modelling of fibre and duct asset costs, we do not consider that it is appropriate to make an adjustment to the standard approach. It is the specific nature of transmission and accommodation assets that makes it difficult for BT to redeploy them.³⁸¹ In contrast, as BT acknowledges, it is more likely that fibre and duct assets can be redeployed more readily. For example, where a customer upgrades from a TI circuit to an Ethernet circuit, it is likely that the duct that is used to provide the TI service will be used to provide the Ethernet service. In reaching this decision, we have noted that BT has not provided evidence to support its points on fibre and duct, while we consider that a moderating factor of one half would be an arbitrary adjustment.
- 6.194 Therefore, for all asset types except transmission and accommodation, we have decided to calculate additional disposals in the following way:
- If the requirement for productive assets declines over time, i.e. volumes are reducing year-on-year, then we assume that BT manages the declining asset demand in the first instance by not investing in steady state capex. This is consistent with our typical top-down approach.
 - However, where the decline in demand for assets is so large that the decline cannot be met through forgoing steady state capex, we assume that BT will make additional disposals of averagely aged assets. The average age of BT's assets is derived from NRC:GRC ratios.³⁸²
- 6.195 We consider that this approach, which values asset disposals using the average age of assets, strikes an appropriate balance between the potentially competing considerations an efficient firm would be faced with when deciding how to manage a reduction in its asset base in response to declining volumes.³⁸³

We have adopted pay inflation of 3.0% and non-pay inflation of 3.2%

- 6.196 Section 5 summarises our June 2015 LLCC Consultation proposals and our response to stakeholders comments on pay and non-pay inflation.

³⁸¹ For example, SDH Transmission equipment is largely specific to services using legacy TDM technology; while in general, accommodation will only become vacant if a rack can be removed in its entirety.

³⁸² Due to circularity considerations, in practice we use the prior year NRC:GRC ratio.

³⁸³ For example, considerations such as the presence of costs of disposing/redeploying assets might lead to a profit maximising firm to adopt an older asset base, while penalties associated with poor service may in some cases lead to the use of a younger portfolio of assets.

- 6.197 We have departed from our proposal to apply a single assumption for non-pay inflation of 2.6% to both Ethernet and TI services and have adopted different assumptions for each. A more detailed discussion of our methodology and assumptions is provided in Annex 32.
- 6.198 In summary, we have adopted the following input price inflation values in our 2016 LLCC Model:
- Pay inflation at 3.0%; and
 - Non pay inflation at 3.2% per annum for TI services.

We have adopted a pre-tax nominal cost of capital of 9.8%

- 6.199 We have decided to use a pre-tax nominal Other UK telecoms WACC of 9.8% for both Ethernet and TI services. A summary of our June 2015 LLCC Consultation proposals, stakeholders' comments and the reasons for this decision are explained in Section 5 and Annex 30.

Section 7

Balancing the use of glide-paths and starting charge adjustments

Introduction

7.1 In this section, we discuss our consideration of Stages 4 and 5 of our methodology³⁸⁴ for designing our charge control for Ethernet and TI services. In this section, we discuss our consideration of Stages 4 and 5 of our methodology³⁸⁵ for designing our charge control for Ethernet and TI services.

7.3 In particular we explain our decisions with regard to:

- **Stage 4 - considering the case for one-off adjustments to charges at the start of the charge control, i.e. a starting charge adjustment (SCA), including whether to:**
 - adopt SCAs based on concerns regarding distorted pricing signals; and
 - adopt SCAs on the basis that BT's charges are likely to be significantly above cost for reasons other than efficiency or volume growth.
- **Stage 5 - calculating the value of X for the basket(s) of services.**

Summary

7.4 Our general preference is to set charges using glide paths to bring charges into line with projected costs by the end of the control period, rather than imposing one-off changes to charges at the start of control period. This is consistent with our incentive regulation approach. However, as we find that returns for these services are high (persistently more than double BT's cost of capital), we have decided to make immediate adjustments, referred to as starting charge adjustments, for both Ethernet and TI services. We have adopted starting charge adjustments of -12% for Ethernet services and -9% for TI services within this control. These starting charge adjustments mean that the value of X will be -13.25% for Ethernet services and -3.5% for TI services.

Stage 4: Consider the case for one-off adjustments to charges at the start of the charge control

7.5 In Section 4, we set out the principles under which we would consider the case for one-off adjustments to charges at the start of the charge control. We now discuss the application of these principles in relation to the Ethernet and TI baskets. At the end of

³⁸⁴ As set out in paragraph 4.2 of Section 4, Volume II of this statement.

³⁸⁵ As set out in paragraph 4.2 of Section 4, Volume II of this statement.

this section we conclude on the values of X for the different baskets (Stage 5 of our methodology).

We have not found any distorted pricing signals that would lead us to make a SCA

June 2015 LLCC Consultation

- 7.6 In the June 2015 LLCC Consultation we did not propose to make SCAs for the reason of distorted pricing signals. We compared BT's aggregate service charges to their costs using 2016/17 forecast data. We proposed that if charges were significantly above DSAC (or possibly double FAC) or below DLRIC, we would consider a SCA. We did not find any charges that met this test and therefore did not propose SCAs due to distorted pricing signals.

Stakeholders' comments

- 7.7 Vodafone disagreed with Ofcom's proposal that the potential for distorted pricing signals be assessed on an aggregated basis. It believed that charges should be compared against cost benchmarks for each disaggregated component individually (connection, local end, distribution, main link, etc.). Vodafone referred to Ofcom's previous statements³⁸⁶, the CAT 2014 Judgment on Ethernet overcharging and Ofcom's 2012 Determination and Explanatory Statement in relation to the same matter, all of which, in Vodafone's view, supported the use of a disaggregated approach. Vodafone points out, with reference to the declining TI market, that the aggregated approach gave BT a clear opportunity to distort pricing signals significantly by pricing rentals high and connections low relative to DSAC (or double FAC), in the knowledge that the aggregated analysis would give a vastly overstated weighting to connections prices (actual connections being less than 4% of the connections volume implied by Ofcom's three-year aggregated approach).

Our conclusions

- 7.8 We consider that it is appropriate for us to assess the charges for services in aggregate, combining rental and connection prices. All customers for a service require both a connection and rental, and we consider that BT should have some flexibility in determining the balance of cost recovery between connections and rentals. We have not identified concerns in terms of strategic incentives or distortion of competition which would cause us to change this view. We note that our approach is consistent with the 2009 LLCC, in which we used an aggregated assessment in determining the level of SCAs.³⁸⁷ The CAT Judgment and Ethernet Determinations, as well as some parts of previous LLCCs related to cost orientation, which is a different exercise from considering SCAs, as set out in the Determinations. In particular, the assessment relating to cost orientation is driven by the relevant legal conditions which specifically refer to "each and every charge".
- 7.9 We have updated our analysis performed for the June 2015 LLCC Consultation³⁸⁸ and compared BT's charges for each Ethernet service and each TI service in

³⁸⁶ 2013 LLCC Statement, 2009 LLCC Statement

³⁸⁷ E.g. para 5.90 of the 2009 LLCC Statement

³⁸⁸ See Annex 6, paragraphs 6.18 through 6.24 of the June 2015 LLCC Consultation.

aggregate³⁸⁹, to our forecasts of DSAC and DLRIC in the first year of the next control (2016/17).^{390 391} Our analysis continues to show that no Ethernet services in our basket will be priced above DSAC in 2016/17 when considered in aggregate³⁹² and that no TI services in our basket will be priced above DSAC in 2016/17 when considered in aggregate.³⁹³

- 7.10 Our analysis also shows that some TI services are priced below DLRIC when considered in aggregate, notably 64Kbit/s PPCs and 2Mbit/s PPCs in the Central London Zone. We have decided not to make any starting charge adjustments to TI services that are priced below DLRIC. Prices that are below DLRIC could cause consumer harm by deterring efficient entry. However, we do not expect entry into the declining TI market, meaning that such concerns are unlikely to materialise.

We have decided to make SCAs for TI and Ethernet services on the basis that BT's charges are likely to be significantly above cost for reasons other than efficiency or volume growth

November 2015 LLCC Consultation

- 7.11 In the November 2015 LLCC Consultation we proposed to make SCAs on the basis that BT's charges are likely to be significantly above cost for reasons other than efficiency or volume growth. We made reference to the historical profitability of Ethernet and TI services as reported in BT's RFS over the recent years.³⁹⁴ We estimated that volume and efficiency outperformance of the 2013 LLCC accounted for only about a fifth of BT's 2014/15 profits in excess of WACC. We focused our assessment of the level of SCAs only on the portion of profits in excess of WACC that did not relate to volumes and efficiency outperformance.
- 7.12 In balancing the use of glide-paths and SCAs, we placed emphasis on our statutory duties and Community obligations and considered a broader set of criteria compared to the June 2015 LLCC Consultation, including:
- Benefits to customers and end-users from bringing charges quickly into alignment with costs;

³⁸⁹ For example, in the case of an EAD circuit we consider the total cost of purchasing the service over three years, including the connection, rental and main link charges. Whereas for example, in the case of a PPC 2Mbit/s circuit outside the CLZ we consider the total cost of purchasing the service over three years, including the connection, local end, link, distribution and regional trunk charges.

³⁹⁰ As set out in Volume II Section 4 of this statement, we consider DSAC and DLRIC more economically meaningful comparisons than double FAC, given that FAC is an accounting measure of costs rather than an economic measure.

³⁹¹ A more detailed explanation of our analysis is provided in Annex 26.

³⁹² There are some individual connection charges that are forecast to be above DSAC, namely EAD/EAD LA 100Mbit/s and 1Gbit/s and EBD 1Gbit/s connection charges. However, as discussed above, we do not consider individual services when deciding whether or not to make a starting charge adjustment.

³⁹³ There are some individual charges that are forecast to be above DSAC, namely PPC link charges for 64kbit/s and 2Mbit/s services and 2Mbit/s PPC local ends delivered using copper. However, as discussed above, we do not consider individual services when deciding whether or not to make a starting charge adjustment.

³⁹⁴ 2011/12 to 2014/15, using restated figures where available.

- Ensuring the regulated firm has an opportunity to recover its efficiently incurred costs;
- Supporting investment in competing infrastructure by other CPs;
- Avoiding discontinuities in charges over time; and
- Promoting efficient migration signals.

7.13 For each of the criteria we evaluated, whether it pointed to shifting the balance more in favour of using a glide path or a SCA, we applied our regulatory judgment in weighting each of the criteria. Having weighted the criteria, we then determined the combination of SCA and X we considered appropriate for Ethernet and TI services, respectively. We proposed making a 10% SCA for Ethernet services and a 5% SCA for TI services.

Stakeholders' comments

7.14 Below we set out stakeholders' comments on our SCAs proposals set out in the November 2015 LLCC Consultation, grouped by issue.

Profitability of TI services

7.15 BT claimed that in the case of TI services, the returns appear high because many of the assets have become fully-depreciated or near fully-depreciated, which tends to distort the reported level of profitability. It pointed to a number of reasons why reported returns may appear high for services where assets are approaching the end of life. It also pointed to the fact that the returns on mean capital employed (ROCE) of low bandwidth TI services (up to and including 8Mbit/s) were below the weighted average cost of capital up until 2009/10. BT suggested that on the basis of costs consistent with a hypothetical market entrant, returns would be considerably lower.

7.16 Vodafone noted that BT's profits from TI services have stood at £400m³⁹⁵ above its regulated cost of capital allowance since 2006. Frontier Economics (on behalf of Vodafone) argued that given the low value of TI assets and the historic excess returns on TI services, there is no need to maintain prices above costs to ensure BT's investors can earn adequate returns over the lifetime of TI assets. Frontier Economics pointed out that BT's over-recovery on TI services over the last decade (£400m) is far greater than the current mean capital employed (MCE) for TI specific assets (£178m in 2014/15)³⁹⁶, so BT's investors have likely fully recovered the remaining TI specific asset value before this charge control.

³⁹⁵ We note that the figures presented by BT suggest returns in excess of WACC over the same period in the region of £70m, rather than £400m. They also suggest the actual return was about £170m less than would be required to cover the cost of capital in 2004/05. See BT's response dated 15 December 2015 to the November 2015 LLCC Consultation, p 16, Table 5. We have multiplied the MCE and WACC presented by BT for each year and compared the result with the returns presented by BT in the same table.

³⁹⁶ We note that BT's total MCE for low bandwidth TISBO was £451m in 2014/15.

Other comments on BT's profitability

- 7.17 TalkTalk said that although outperformance could contribute to an excess in one year, over several years one would expect BT to under-perform in some years and over-perform in others.

Other life cycle effects of TI services

- 7.18 BT stated that, as a result of TI being a declining market at the retail level with a resulting decline in the level of competition, it is less likely that CPs will pass on one-off price reductions to their end user customers. Also, with the rapid decline of TI services, it claimed that it is implausible that one-off price cuts would lead to additional innovation and investment in these legacy services.
- 7.19 Vodafone argued that for TI services, at this stage of the life cycle, the key incentive effects of a classic CPI-X charge control are largely lost, as the focus shifts towards managing a service with reducing numbers. Vodafone noted that BT has no intention to develop existing TI products and will be focused on administering them. Also, no new investment in these products is planned. Frontier Economics suggested that in competitive markets where volumes are declining due to technological changes analogous to TI, companies set prices to maximise the future cash flows from existing sunk assets. These may be below 'average' unit costs. In competitive markets, it is not possible to recover the cost of sunk assets that were acquired to serve previous customers from the remaining customers. Frontier Economics concluded that the falling demand for TI services means that allocative efficiency should be given more weight.

Consumer pass-through of price reductions

- 7.20 Virgin Media noted that the importance of end-user customers purchasing point-to-point connectivity is not in itself supportive of a preference for SCAs compared to glide paths. Also, Virgin Media saw no justification for or evidence of SCAs being more likely to lead to end users receiving a greater pass-through of reductions in charges.

Consumer benefits relating to productive and dynamic efficiency

- 7.21 Virgin Media argued that Ofcom failed to present the benefits to consumers stemming from productive and dynamic efficiency gains that the glide path approach provides. Also, Virgin Media claimed that Ofcom did not provide any estimate of the productive and dynamic efficiency benefits that would be forgone as a result of imposing a SCA.

Investment in competing infrastructure

- 7.22 BT argued that Ofcom did not place enough weight on the damage SCAs will do to investment incentives for Ethernet services. First, lower prices make it less attractive for BT and OCPs to invest in those services. Second, BT and OCPs will find investment in Ethernet services less attractive as future prices are less certain due to Ofcom's approach to SCA. Also, BT suggested that Ofcom only considered competing infrastructure providers, but failed to consider BT's incentives to invest.

Discontinuity in charges over time

- 7.23 Virgin Media argued that BT's one-off voluntary price changes are not indicative of the anticipated impact of one-off changes mandated through the control. BT's changes were potentially made in response to competition, changes in demand, or a wide range of other factors; these commercial decisions are driven by market dynamics, while Ofcom's proposed SCA is an exogenous change, which may cause instability or unanticipated outcomes.
- 7.24 Virgin Media also suggested that the effect of BT's previous price cuts may not yet be fully realised due to the lag in re-contracting and time taken by upstream competitors to react to BT's price changes and further price changes may compound any market volatility currently in progress.
- 7.25 Also, Virgin Media suggested that Ofcom should take into account the potential for a cumulative effect of repeated discontinuities, which may lead to a disruption in competitive dynamics and market signals. Even if the probability of unanticipated market disruption is low, the scale of damage to upstream competitive conditions, investment incentives and end-users warrants preferring a glide path approach.
- 7.26 In support of SCAs, Frontier Economics (engaged by Vodafone) argued that it is not clear why a downward discontinuity in prices to an appropriate cost based level would result in significant inefficiencies in the TI market.

Efficient migration signals

- 7.27 BT claimed that Ofcom did not place enough weight on the damage a SCA on TI services will do to incentives to migrate. BT suggested that a one-off price reduction is likely to unnecessarily delay efficient migration. BT also pointed out that the SCA imposed on TI services drives the assessment of the impact of SCA on Ethernet services with respect to promoting efficient migration. BT also observed that, depending on future inflation and the value of X for TI services, there may be a price cut at the start of the control followed by price increases, which would not provide the right price signals to encourage migration.
- 7.28 Vodafone rejected the argument that keeping TI prices high will incentivise migration, as in the majority of cases customers will need to spend much more on alternative business grade products as a product void has opened for them. Similarly, Frontier Economics (on behalf of Vodafone) argued that Ofcom's assertion that higher prices of TI services will lead to more efficient migration is not supported by evidence. From a productive and allocative efficiency perspective, TI prices which better reflect the short-run marginal costs of TI services would be more appropriate. Frontier Economics also noted that some customers have large sunk investments associated with TI and the capability of Ethernet will far exceed their needs.
- 7.29 Frontier Economics (engaged by Vodafone) also argued that Ofcom does not provide a robust assessment of what an efficient rate of migration would be. Frontier Economics suggested that a quicker rate of migration may be better at the end of a product's life, where fixed costs could be avoided by migrating all remaining customers, but TI is not yet at this point. It also suggested that Ofcom should take account of the costs across the whole value chain, not just BT's, and the assessment should focus on forward looking expenditure (ignoring sunk costs).

- 7.30 Frontier Economics argued that Ofcom's reasoning is inconsistent, because if the efficient level of TI prices for migration was indeed above costs, then the charge control should set the forward looking prices at this level.

Weighting of the relevant considerations

- 7.31 BT agreed that against three of the five considerations there should be more emphasis on glide paths rather than SCAs for TI services. It suggested that Ofcom's proposal to make a SCA for TI services is based on giving a higher weight to the consideration of '*Benefit to customers and end users associated with bringing charges quickly into line with costs*' over the other three considerations, which BT argued is contrary to Ofcom's own analysis of the relevant considerations.
- 7.32 Similarly, BT agreed that against two of the five considerations, there should be more emphasis on glide paths rather than SCAs for Ethernet services. It suggested that Ofcom's proposal to make a SCA for Ethernet services is based on giving a higher weight to the considerations '*Benefit to customers and end users associated with bringing charges quickly into line with costs*' and '*Promoting efficient migration signals*', the latter being in part a result of the decision to implement a SCA for TI services.

Making an SCA to adjust for errors

- 7.33 BT maintained that, should Ofcom continue to propose SCAs in the final statement, the SCA reductions should be no more than 1.8% and 0.65% for Ethernet and TI services respectively, which represents adjustments for errors.
- 7.34 TalkTalk argued that where a price-cost difference arises from modelling or data errors, a SCA would not reduce productive efficiency incentives.

BT's compliance incentives

- 7.35 TalkTalk suggested there should be a 15% to 20% SCA for Ethernet, reflecting that BT has caused much of the excess by gaming the regulatory process, and that Ofcom should consider the effect of making SCA (or not) on BT's compliance incentives, i.e. not imposing a SCA provides BT with greater incentives to game regulation.
- 7.36 Sky argued that Ofcom should increase the level of one-off price reductions at the start of the next control in order to limit BT's incentive and ability to overstate its costs. Sky suggested that BT has a strong incentive to inflate its costs of regulated services because it gains from doing so with no downside risk. Sky noted that proving that BT's costs are wrong is difficult and time-consuming due to the information asymmetry between BT and Ofcom.³⁹⁷

Other comments from stakeholders

- 7.37 TalkTalk suggested that it is simplest to express the excess profits in terms of prices above cost rather than return above WACC, since the former is easier to understand.

³⁹⁷ Sky also suggested that BT's incentives and ability to overstate its costs will significantly increase with the merger of BT and EE, as the potential gain and scale of overstatement will increase, while the additional accounting complexity will provide additional opportunities to overstate costs and make it more difficult to identify such overstatement.

Our conclusions

- 7.38 In the paragraphs below, we address stakeholders' comments and set out our decisions on the SCAs for Ethernet and TI services.
- 7.39 The starting point for our assessment as to whether to impose an SCA is consideration of BT's profitability for these services. This profitability is reported in Figure 7.1 below.³⁹⁸

Figure 7.1: BT's rates of return on mean capital employed as per regulatory financial statements



Source: BT regulatory financial statements, Ofcom analysis; Subsequent restatements of prior years' financial information by BT are reflected; AISBO refers to Non-WECLA except for 2011/12, which is presented for the whole of the UK.

- 7.40 In each of the years of the current control BT's rates of return on the services of particular interest to the 2016 LLCC have been significantly in excess of its cost of capital (e.g. pre-tax nominal WACC of 11.0% for the 2009 LLCC and 9.9% for the 2013 LLCC).³⁹⁹ Although the 2013 LLCC has reduced BT's profitability for Ethernet services, in the final year of the current control BT's ROCE will still be more than double BT's cost of capital. For TI services, BT's ROCE has increased in each year of the 2013 LLCC. We consider that these high and persistent returns are

³⁹⁸ In response to TalkTalk's suggestion that it is simplest to express the excess profits in terms of prices above cost rather than return above WACC we accept there are merits in different forms of presenting excess returns. We have included a revenue-based presentation of the excess returns along with the WACC-based presentation where we consider it relevant.

³⁹⁹ See the 2009 LLCC Statement, p 69, Table 3.1 and the 2013 BCMR Statement, Annex 14, p 348, Figure A14.1.

exceptional, and mean that we should investigate further whether an SCA is warranted.⁴⁰⁰

- 7.41 We disagree with BT that the costs (and returns) of TI services should be considered on the basis of a hypothetical market entrant. As discussed in Volume II Section 6, for the purposes of this charge control we consider BT's profitability from the perspective of BT's actual costs and revenues over the control period. Given that the 2013 LLCC has been set on the basis of CCA FAC, it is appropriate to assess BT's returns over the control period on the same basis. We have historically used the CCA FAC approach to cost recovery for leased lines, which should lead to the correct recovery of the costs of an asset over its lifetime, although the pattern of cost recovery over the lifetime may differ from other approaches.

BT's charges for controlled services are likely to be significantly above cost for reasons other than efficiency or volume growth

- 7.42 Charges and costs can diverge over a control period for reasons other than volume and efficiency outperformance by the regulated firm. In Annex 5 to the June 2015 LLCC Consultation we set out our analysis of the extent to which BT's returns for TI and Ethernet services in 2013/14 exceeded our forecasts when setting the 2013 LLCC, and our understanding of the key factors contributing to that outperformance.
- 7.43 As we have explained in Annex 5 of the June 2015 LLCC Consultation, precisely decomposing the various factors that give rise to apparently high profitability for charge controlled services is complex, particularly in light of BT's complex financial reporting arrangements and the changes that BT makes each year to how it reports costs. As such there is a degree of uncertainty surrounding the precise quantification of the various apparent impacts.
- 7.44 Nonetheless, our analysis shows that, although outperformance in respect of efficiency and volumes was a factor in BT's relatively high rates of return, it does not explain the majority of the higher than expected returns. We estimate that for the business connectivity services covered by the 2013 LLCC only around a quarter for Ethernet and just above a third for TI of the difference between BT's 2013/14 returns and our forecast returns⁴⁰¹ relate to volume and efficiency outperformance.^{402 403} We

⁴⁰⁰ In response to TalkTalk, which considered one would expect under performance in some years and outperformance in others, we do not consider outperformance is a purely random factor. Although the charge control forecasting assumptions are set to make out- and underperformance equally likely, the CPI-X regulation model provides BT with strong incentives to seek unforeseen opportunities to outperform the forecast. Therefore, if the incentives are effective, we should observe more outperformance than underperformance.

⁴⁰¹ We forecast that BT's returns would be higher than its cost of capital in 2013/14 because of the use of a glide-path to close the gap between charges and costs that had arisen in the previous control period.

⁴⁰² In the period since the June 2015 LLCC Consultation was published outturn volumes for 2014/15 have become available. We have therefore updated the analysis presented in Annex 5 of the June 2015 LLCC Consultation to include 2014/15 actual volumes. We have assumed outturn efficiency improvements of 5.0%, which corresponds to our estimate of BT's efficiency improvement in recent years, as discussed in Annex 29. On this basis we continue to find that volume and efficiency outperformance explain a relatively small percentage of the higher than expected profitability for the 2013 LLCC charge controlled services. We estimate that for both TI and Ethernet, efficiency and volume outperformance explains only around a fifth of the returns in excess of our forecasts when we set the 2013 LLCC.

consider that at least some of BT's higher than expected returns are likely to have resulted from the way in which BT attributes costs.

7.45 Therefore, we consider that the threshold for considering a SCA is met given that:

- BT's return for the business connectivity services relevant to the charge control has been exceptionally and persistently high, substantially above its cost of capital for a number of years; and
- these high rates of return do not appear to be primarily due to outperformance by BT against the efficiency and volume assumptions used in setting the 2013 LLCC. Indeed, such outperformance appears to be a relatively small factor in explaining BT's high rates of return.

We consider that balancing the considerations relevant to our duties implies SCAs are appropriate in this case

7.46 Having found that BT's charges significantly exceed costs (and, in the absence of the charge control, are likely to continue to exceed costs in the next control period) and that this is not primarily as a consequence of volume and efficiency outperformance, a regulatory judgement is required to determine the appropriate balance between SCAs and glide-paths in this case. In Volume II Section 4 we explain that we consider this regulatory judgement involves balancing various considerations in light of our statutory duties and Community obligations.

7.47 In the paragraphs below we set out:

- the considerations we believe to be relevant in this case to our judgement – they are the considerations set out in the November 2015 LLCC Consultation, while including a separate consideration of consistency with our incentive regulation approach;
- our final assessment of the implications of those considerations for the TI and Ethernet baskets; and
- our judgements in relation to the appropriate level of SCAs in this case in light of our assessment of the various considerations.

Benefits to customers and end-users from bringing charges quickly into alignment with costs

7.48 The use of a pure glide-path approach in circumstances where charges significantly exceed costs results in customers paying significantly more for the charge controlled services over the control than is required to cover the controlled firm's efficient costs of providing the services. We estimate that, compared to an approach where charges were set to our forecast of efficient costs in each year of the control, a pure glide-path

⁴⁰³ In generating our estimates of efficiency outperformance in Annex 5 of the June 2015 LLCC Consultation we assumed that BT's outturn efficiency improvement had been 5% for both TI and Ethernet. BT's response to our June 2015 LLCC Consultation appeared to imply it considered that its recent efficiency performance in relation to business connectivity services was less than 5%. If this is the case it would imply that our profitability analysis may overstate the contribution of efficiency outperformance to the relatively high levels of profitability.

approach would mean that BT's customers would pay close to an extra £233m for Ethernet services and more than £82m more for TI services over the next control period. In the first year of the 2016 LLCC, assuming charges remain unchanged we estimate that about 39% of BT's total Ethernet revenues⁴⁰⁴ and 31% of total TI revenues⁴⁰⁵ will be in excess of costs (including a return on capital). These figures are high and suggest the potential for significant consumer benefit from using SCAs to bring charges into line more quickly.

- 7.49 We agree with Vodafone that allocative efficiency should be given relatively more weight for TI services. However, we do not consider that TI services at this stage of their life cycle should be priced below their long-term 'average' costs (e.g. FAC). Ofcom's approach to determining charges historically has not been based on product life cycle effects. Changing the approach now for TI services would be a departure from our consistently applied approach, which we do not consider would be appropriate as it could impact on BT's opportunity to recover its efficiently incurred costs.
- 7.50 BT's customers for business connectivity services are normally not the end-users of the services. Rather, typically they are alternative communications providers that purchase wholesale inputs from BT to support the retail services that they supply to end-users. In some cases the business connectivity services are used to provide the backhaul needed to provide broadband or mobile services. In other cases the services are used to supply point-to-point connectivity for end-users. This latter category is particularly relevant in terms of the potential benefits to end-users via price reductions, as BT's services are likely to represent a marginal cost for OCPs and, consequently, price changes made by BT are more likely to be passed onto the end-users by those OCPs.⁴⁰⁶ In other cases, enabling BT's customers to benefit from bringing BT's charges more quickly into alignment with cost is more likely to be consistent with supporting effective competition in downstream markets (particularly in relation to Ethernet services) than adopting a pure glide-path approach.⁴⁰⁷ For example, BT's customers buying leased lines for backhaul are more likely to upgrade earlier if the relevant services become cheaper, which will also benefit end-users.
- 7.51 On the basis of the above, we have decided to place significant weight on the benefits to customers and end-users from bringing charges into alignment with costs quicker. BT's customers will benefit directly by way of cost savings, while end users that are not BT's customers will benefit either from price reductions passed onto them by BT's customers (especially where BT's services are used to provide point-to-point connectivity to end-users) or as a result of promoting downstream competition (e.g. BT's backhaul customers being more likely to upgrade earlier).

⁴⁰⁴ Or close to an extra £290m return in excess of BT's costs.

⁴⁰⁵ Or close to an extra £70m return in excess of BT's costs.

⁴⁰⁶ We consider that Virgin Media may have misunderstood our point in the November 2015 LLCC Consultation, when it noted that the importance of end-user customers purchasing point-to-point connectivity is not in itself supportive of a preference for SCAs compared to glide paths. Our point is that BT's services used to supply point-to-point connectivity for end-users are more likely to represent a marginal cost for the CPs purchasing those services and therefore any price reductions are more likely to be passed through to end users. In the circumstances where we make SCAs, more of BT's profits are potentially subject to pass through than would be in case of a pure glide path approach.

⁴⁰⁷ Given that higher access charges can be associated with a reduction in competition in downstream markets.

Consistency with our incentive regulation approach

- 7.52 In making our regulatory judgment about the level of SCAs, we seek to avoid choices that would be similar to applying a rate of return regulation. As we have explained in paragraphs 4.88 to 4.92 above, our current regulatory model is based on incentive regulation, which, by creating the potential for the regulated firm to beat the control, does not seek to align charges with costs at all points in time. We consider that incentive regulation creates better incentives for investment and efficiency by the regulated firm than regulation which seeks to strictly align prices with costs at all points in time. The dynamic and productive efficiency benefits of incentive regulation (as opposed to rate of return regulation) may be difficult to quantify but we consider that they are likely to be significant and we are keen to ensure that they are preserved.
- 7.53 In response to Virgin Media we note that dynamic and productive efficiency benefits are at the heart of our approach, as manifested in our general preference for glide paths, our consideration of the extent to which volumes and efficiency outperformance contribute to BT's profitability, and the considerations we refer to in balancing a SCA with a glide path.
- 7.54 Although we consider that the exceptionally high and persistent profitability in this market means that a SCA is appropriate, we are clear that this is due to exceptional circumstances and does not mean a move towards a rate-of-return style regulation.
- 7.55 Consequently, where faced with a range of options for achieving price reductions by a combination of SCA and glide-path in the first year of the control, we consider it appropriate to avoid values that would be based on attempting to strictly align BT's revenues with costs (or with any specific mark-up on costs) in that particular year, or removing all expected returns beyond some specific thresholds.
- 7.56 In response to TalkTalk and Sky's comments regarding the role of a substantial SCA in reducing BT's incentives to game the regulatory process and inflate costs, we note that distinguishing the effects of potential 'gaming', which might cause a systematic over- or understatement of costs, from other sources of deviation from expected returns such as modelling simplifications, which are not expected to cause a systematic over- or understatement, is not always possible or reasonably practicable. Removing excess profits of the regulated entity by default, unless some 'merits' of those profits that can be proved, would result in a significant move towards a rate-of-return regulation, which we do not consider desirable due to the reasons cited above.

Ensuring the regulated firm has an opportunity to recover its efficiently incurred costs

- 7.57 As we set out in the June 2015 LLCC Consultation⁴⁰⁸ and the November 2015 LLCC Consultation⁴⁰⁹ we seek to ensure that the regulated firm has an opportunity to recover its efficiently incurred costs through the use of the 'fair bet' principle.⁴¹⁰ This approach is an important consideration for Ofcom because it supports dynamic efficiency improvements by creating a regulatory environment that is conducive to investment by the regulated firm.

⁴⁰⁸ For example see A11.3-A11.7.

⁴⁰⁹ See paragraph 6.53 of the November 2015 LLCC Consultation.

⁴¹⁰ Here we have also considered BT's views about the effect that our approach to SCAs as proposed in the June 2015 LLCC Consultation would have on investment incentives.

- 7.58 In the June 2015 LLCC Consultation we noted that some costs previously considered to be part of the business connectivity markets are now associated with other charge controlled markets. In particular, some costs are now associated with other charge controlled markets, but are not reflected in those other charge controls which expire on 31 March 2017.⁴¹¹ Although these costs are likely to be reflected when the next charge controls are set, there is likely to be at least a one-year gap between the start of this charge control and the start of the next control for those other markets. If these costs were removed from the BCMR markets through a SCA, but not included in the other charge controls until at least a year later, then BT may be denied the opportunity to fully recover its efficiently incurred costs. This would be contrary to one of our regulatory objectives.
- 7.59 To the extent that BT's excess returns might be related to such costs, we consider it appropriate, when adopting a combination of SCA and glide-path, to ensure that returns (i.e. profit) in excess of WACC relating to this are not removed in the first-year of the control. This means that BT is not denied the opportunity to recover its efficiently-incurred costs.
- 7.60 We have estimated the impact of BT's changes to its RFS that resulted in cost re-attribution from charge-controlled business connectivity services to other charge-controlled markets. We estimate this to be approximately £44m and £13m for Ethernet and TI services, respectively. Based on our forecast of BT's 2016/17 costs and revenues, this represents about 15% of BT's returns in excess of WACC for Ethernet services and about 19% for TI services.
- 7.61 Based on the above, we consider it appropriate to exclude the estimated impact of BT's cost re-attributions to other charge controlled markets from BT's 2016/17 forecast returns in excess of costs in determining the scope for a first-year control (i.e. the maximum combined impact of SCA and glide path in the first year of the control).

Supporting investment in competing infrastructure by other CPs

- 7.62 Although we find that BT has SMP for the provision of Ethernet services in the UK outside of the CLA and Hull, BT does nevertheless face some competition in this SMP market from competing infrastructure providers. The use of glide-paths during periods in which charges need to change significantly to come into alignment with costs can give BT's wholesale competitors longer to adapt to the changes in BT's charges and better plan their future investments accordingly. Therefore, greater emphasis on the use of glide-paths, particularly in relation to Ethernet, may be more consistent with supporting investment by wholesale competitors to BT.
- 7.63 However, having considered BT's comments, we do not believe that investment decisions would be significantly affected by a SCA. In our view investment decisions are based on a longer-term view of expected prices, such as those in the final year of the charge control. We note that the present need for a SCA is due to BT's returns being significantly in excess of those forecast in the 2013 LLCC.⁴¹² We also believe that the opportunity to earn returns in excess of the cost of capital is primarily

⁴¹¹ The 2014 FAMR Statement, Volume 2, Section 1, paragraph 1.4; the 2014 WBA Statement, Section 7, paragraph 7.3.

⁴¹² We note that the re-attribution of costs into other charge controlled markets might affect BT's opportunity to recover efficiently incurred costs, which we also reflect in the balance between SCAs and glide paths.

relevant where investments are made in new products associated with a higher riskiness, such as Ethernet products in the early phases of their life cycle. Ethernet is now an established technology and has been so for a number of years, while BT has consistently earned returns for these services in excess of its WACC.

- 7.64 In addition, BT seems to imply that investment incentives would generally be better in the absence of a charge control. We have set our charge control at a level which we consider promotes efficient investment, and replicates the outcome of a competitive market.
- 7.65 As we do not anticipate material investment by other CPs in TI services over the next control period,⁴¹³ this consideration is in any event of less relevance for the TI basket than the Ethernet basket. We note that BT and Vodafone seem to agree that any dynamic benefits (in terms of innovation and investment) are largely lost at this stage of the TI services life cycle. We however note that actions in regulating TI services can affect investment in other regulated markets if they affect regulatory certainty, e.g. by if the benefits of volumes and efficiency outperformance are removed by a SCA rather than a glide path in the TI market, CPs might perceive a risk of a similar approach being adopted in other regulated markets in the future. In addition, we note there are shared costs between TI and other services where efficiency improvements can be made (as set out in Annex 29). To the extent that there is still some potential for efficiency outperformance in the TI market, we consider that removing the benefits of such outperformance through a SCA would reduce the incentives for such efficiency improvements in the future.
- 7.66 On the basis of the above, we do not consider that making a SCA for Ethernet or TI services would have a significant impact on the investment in competing infrastructure by other CPs, provided that the level of SCA does not affect regulatory certainty, e.g. by taking away the benefits of volumes and efficiency outperformance.

Avoiding discontinuities in charges over time

- 7.67 The use of glide-paths can help to avoid discontinuities in charges over time, which in turn may lead to a more stable and predictable background against which investment and other decisions may be taken by both the regulated firm and its competitors. The use of glide-paths can therefore support improvements in dynamic efficiency.
- 7.68 However, where charges significantly exceed costs, and this is expected to remain the case by the end of the control period assuming charges remain unchanged, the use of a glide-path approach will itself involve large annual price changes. In such a case, the benefits associated with smoothing price reductions over time may not be as significant as they would be where charges are more closely aligned with cost. Adopting a pure glide-path for Ethernet services would lead to year-on-year price reductions of 17.0% over the next control period. Therefore substantial discontinuities in charges over the next control period cannot be avoided even by a pure glide-path approach.
- 7.69 We have also looked at the price reductions made by BT to its most relevant Ethernet products over the past years. Within its overall compliance target of RPI-11.5% for the Ethernet basket in the existing control, BT has made several price cuts to individual Ethernet services by far exceeding the basket percentage X (e.g. for 1Gbit/s bandwidth services), and not uncommonly in the range of 30%.

⁴¹³ For example see Volume II Section 5 of this statement.

Consequently, any combination of a SCA and X totalling no more than 30% would generate a first-year price reduction that does not depart from the range of BT's price cuts in recent years. At the same time, investment by OCPs is most relevant for the higher bandwidths (e.g. 1Gbit/s and above) and the newest product technologies (e.g. EAD) where price drops by BT have been most significant.

- 7.70 Therefore, the decision over the appropriate balance of SCAs and glide-paths for Ethernet services is not set against the context of a portfolio of broadly stable historic charges; rather significant annual changes in charges have been a relatively common feature for these services.
- 7.71 In relation to Virgin Media's comments, BT's price cuts are ultimately mandated by the charge control, which has historically been the binding constraint on BT's prices, implying that overall it drives BT's pricing behaviour. BT can be expected to allocate the price cuts to individual products based on the considerations mentioned by Virgin Media, as well as other considerations, in order to maximise the contribution towards its fixed costs and profits within the constraints imposed by regulation. In addition, we have no reason to believe that the effects of BT's previous price cuts have not been fully realised. By the time of this statement, eight months have elapsed since BT's last price cuts for Ethernet services on 1 August 2015, and one year since its last EAD price cuts on 1 April 2015. We have no reason to believe that this timeframe would be insufficient for the market to reflect these changes.⁴¹⁴
- 7.72 BT's charges for TI services have tended to be more stable over recent years, in large part reflecting the different values of X applied to TI basket services compared to Ethernet basket services. However, as we set out in Volume II Section 6 and Annex 32, volumes for TI basket services are forecast to decline significantly over the 2016 control period. We might expect such reductions in volumes to result in the gap between charges and costs to close to some degree over the control period absent any SCAs or glide-path,⁴¹⁵ due to the loss of some economies of scale leading to increases in unit costs.⁴¹⁶ In such circumstances it is possible that an aggressive use of SCAs to lower charges in the first year could result in price increases later in the control period (i.e. years 2 and 3). In our view such a profile of prices over time is unlikely to be consistent with an environment in which investment and other decisions can be well planned by BT and its competitors.
- 7.73 On this basis we conclude that under this consideration we place the same weight on SCAs and glide-paths for Ethernet services whereas for TI services, we consider that we need to ensure that a SCA does not result in an increase in nominal TI charges in later years.

Promoting efficient migration signals between TI and Ethernet services

- 7.74 During periods of rapid change (for example in relation to technological change) there may be benefits to society associated with promoting an efficient migration from legacy technologies and services to newer alternatives, such as migration from TI to Ethernet services in the present case. Charges can be used as a signal to support

⁴¹⁴ We note that BT has published price changes for a number of Ethernet services on 7 March 2016, expected to take effect on 1 April 2016. Due to the closeness to the publication of this Statement, we have not been able to reflect these new prices in our decision.

⁴¹⁵ Assuming charges remain unchanged.

⁴¹⁶ Although this could be offset to some extent by any efficiency savings achieved.

efficient migration in some cases. Therefore, the balance between the use of SCAs and a glide-path can be used to support efficient migration.

- 7.75 As noted elsewhere, demand for TI services is forecast to decline substantially over the next control period as end-users migrate to alternative services, including Ethernet services. As we set out in Volume II Section 6 TI prices are unlikely to be a material factor when customers consider migrating to other services, but nonetheless, it also appears unlikely that the price of TI services will have no effect on the rate of migration to other services.
- 7.76 There appear to be a number of potential impacts on migration incentives associated with the chosen balance between SCAs and glide-paths:
- For end-users and BT's alternative communication provider customers, who supply TI services to end users, we would in principle expect a greater emphasis on glide-paths for TI basket services and SCAs for Ethernet basket services to result in pricing signals consistent with encouraging customers to migrate from TI services to alternative services including Ethernet.
 - For BT the incentives to support migration from TI services to alternative services are likely to be affected differently. Adopting a glide-path for TI basket services will result in TI basket services being more profitable over the control period (relative to more emphasis on SCAs). Conversely, the use of a SCA for Ethernet basket services will reduce the relative profitability of these services for BT. Therefore, an approach that places greater emphasis on glide-paths for TI basket services and SCAs for Ethernet basket services could result in a reduction in BT's incentives to support migration from TI services to alternative services.
- 7.77 These considerations suggest that, although higher TI prices may be consistent with encouraging migration by end customers to Ethernet services, the high profitability of TI services that this implies for BT may give it an incentive to take fewer steps to facilitate such migration. There is uncertainty as to the relative weight of these impacts. In particular, we note that while imposing a SCA will lead to an immediate reduction in BT's profitability, the extent and speed with which changes in TI wholesale charges will be reflected in end user prices is uncertain. We therefore place lower weight on this consideration for the migration from TI to Ethernet services.

Conclusion on our considerations

- 7.78 In our view each of the considerations discussed above can, in broad terms, be related back to either productive or dynamic efficiency with the exception of the benefits to customers associated with bringing charges more quickly into alignment with costs, which is related to allocative efficiency. Productive and dynamic efficiency considerations generally support a greater emphasis on the use of glide-paths to close the forecast gap between charges and costs over the control period, whereas the allocative efficiency benefits to customers associated with bringing charges more quickly into alignment with costs imply that greater emphasis is put on the use of SCAs. Our judgement therefore needs to achieve a balance between the various productive and dynamic efficiency considerations, on one hand, versus, the allocative efficiency benefits to customers, on the other hand.
- 7.79 As we set out above, Ofcom has historically attached high weight to productive and dynamic efficiency considerations for wholesale leased lines, rather than trying to closely align charges to costs at every point in time. This is because productive and

dynamic improvements are likely to generate benefits to consumers over time. This broad principle underlies our general preference for glide-paths and we consider it appropriate in achieving the right balance between the considerations set out above. Therefore, in our regulatory judgement, the appropriate balance between the use of SCAs and glide-path should not ignore the benefits to customers from a quicker reduction in charges achieved through SCAs but should place weight on the productive and dynamic efficiency benefits associated with incentive regulation and glide-paths (from which customers are likely to benefit in the future).

7.80 In deciding on the level of SCA, we have balanced the following factors⁴¹⁷:

- **the significant potential benefits to customers from bringing charges closer to costs sooner.** We have estimated the returns in excess of WACC, other than due to efficiency and volumes outperformance, to amount to £210m for Ethernet services and £46m for TI services in the first year of the control, corresponding to 28% and 20% of the forecast revenues for Ethernet and TI services, respectively. Price reductions to BT's wholesale services will directly benefit BT's customers. End-users who are not BT's direct customers will benefit either through the price reductions being passed onto them (especially where BT's services are used to deliver point-to-point connectivity, thus BT's charges are likely to represent marginal cost for the other CPs supplying those services) or through the effects of downstream competition (e.g. other CPs buying BT's wholesale services for backhaul are likely to upgrade earlier if the relevant services become cheaper);
- **consistency with incentive regulation.** Where faced with a range of options for achieving price reductions by a combination of a SCA and X in the first year of the control, we consider it appropriate to avoid values that would be based on strictly aligning charges with costs (or any specific mark-up on costs) in that particular year or, similarly, removing all expected returns beyond some specific thresholds. Such values risk suggesting a move towards rate-of-return regulation which would have negative incentive properties, and risk damaging confidence in the regulatory system;
- **allowing BT the opportunity to recover its efficiently incurred costs.** We note that part of the returns in excess of WACC is due to BT's cost re-attributions to other charge controlled markets which will not be reflected in those markets' regulated charges for at least the first year of our control. We consider that such reallocations should be excluded from a potential SCA;
- **error margin.** We recognise there is an inherent margin of error in estimating the impact of the above factors on BT's profitability, which justifies not setting the SCA at the top of the potential range;
- **supporting investment in competing infrastructure by other CPs.** We consider that where significant price changes are necessary to bring BT's charges into line with costs, more emphasis on glide paths may help competing infrastructure providers better adapt to BT's price changes and plan their investment. For Ethernet services, we consider it appropriate to avoid a price

⁴¹⁷ In response to TalkTalk we accept there is some merit in considering the correction of errors in determining the scope for SCAs, although in the present case, we have found this consideration to be of a relatively minor importance compared to our other considerations. We note however that the value of SCAs we have decided to impose is sufficient to remove the effect of errors we have identified.

path where most of the reduction necessary to align charges with costs over the control period would be achieved by SCA, rather than glide path. This consideration is less relevant for TI services where future material investment is not expected;

- **avoiding discontinuities in charges over time.** The declining volumes of TI services mean that their unit costs are expected to rise over the control period, which means that a large SCA might lead to nominal price increases due to the level of basket X and inflation. We consider it appropriate to avoid such a price path, setting a SCA for TI services low enough to ensure the resulting basket X would be sufficiently negative to offset the expected inflation. We note that for Ethernet services, even a pure glide path approach would produce substantial price reductions beyond those of the current control, and thus applying a SCA does not add a significant pricing discontinuity; and
- **promoting efficient migration signals.** We consider that pricing has relatively little importance for the migration between TI and Ethernet services. However, we consider it appropriate that the Ethernet prices keep decreasing faster relative to the TI prices, consistently with the trend set by the current charge control.

7.81 Based on the above considerations, we have decided on the level of SCAs for the Ethernet and TI baskets, as described in the following paragraphs.

We consider the appropriate value of the SCA for the Ethernet basket is -12%

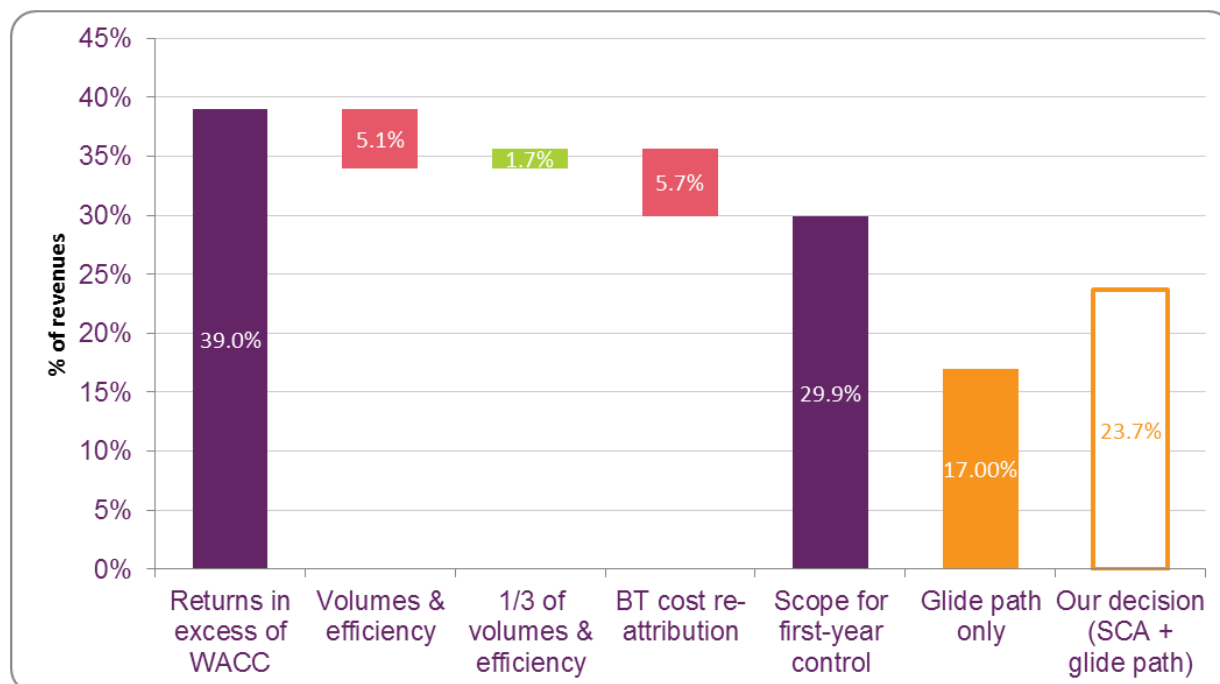
- 7.82 We have analysed the potential impact of a SCA and the resulting value of X on closing the profitability gap for Ethernet services in the first year of the control. We forecast that, without a charge control, BT's returns in excess of WACC would constitute 39% of total revenues. In the absence of an SCA, only about 43% of this excess profit (comprising 17.0% of revenues) would be removed in the first year of the control, through a pure glide path approach. We therefore need to consider how much additional revenues we consider appropriate to remove through an SCA in light of our considerations above.
- 7.83 We consider this in two stages. First, we consider whether any of the returns in excess of WACC should definitely not be removed through an SCA. This helps derive the maximum potential scope of any SCA. Second, we then consider how close the SCA should be to the identified maximum potential scope.
- 7.84 In light of our considerations above, we have identified two sources of returns in excess of WACC which fall into the category of not suitable for a SCA: first, excess profit that has arisen due to BT's outperforming the previous LLCC, whether through exceeding our efficiency target or achieving higher volumes than we had forecast.⁴¹⁸ We consider that returns higher than BT's WACC from this source should not be subject to an SCA, but instead should be reduced gradually through a glide path.

⁴¹⁸ We have estimated the impact of volumes and efficiency outperformance BT's 2014/15 returns using our 2013 LLCC model, as described in Annex 26. We have then calculated the proportion of BT's 2014/15 returns in excess of our 2013 LLCC forecast that can be explained by the estimated impact of volumes and efficiency outperformance. We have assumed the same proportion of the forecast 2016/17 returns in excess of WACC will be due to volumes and efficiency outperformance of the 2013 LLCC and, on that basis, calculated the value of those returns.

This means that no more than one-third of returns from this source should be removed by SCAs or the X in the first year.⁴¹⁹ This is outlined in Figure 7.2 below.

- 7.85 The second source of returns in excess of WACC is associated with changes in BT's cost allocations which reflect costs that are no longer allocated to BCMR services, but to other charge controlled services.⁴²⁰ As these allocations are not reflected in the charge control for those other markets, if these costs are removed in the first year of this control then BT is denied the opportunity to recover these costs for the first year of the control.⁴²¹

Figure 7.2: Summary of analysis of the first year impact of SCA and X for Ethernet services



Source: Ofcom analysis of BT data

- 7.86 Based on the above analysis, no more than a 29.9% reduction of the first year's revenue should be achieved by the combination of SCA and X. This corresponds to

⁴¹⁹ Under a glide-path only approach, if all returns in excess of WACC were due to BT's efficiency and volumes outperformance, approximately one-third of those returns would be removed in the first year by way of a glide path.

⁴²⁰ We have estimated the impact of cost re-allocations by analysing each adjustment that was made to the charge controlled BCMR markets in BT's various Reconciliation Reports for 2012/13, 2013/14 and 2014/15 and in the CAR model. The analysis involved identifying which markets the adjustment could potentially have related to. For example, if the adjustment was to move costs out of a charge controlled BCMR market, we identified the markets where the adjustment was positive and calculated the proportion of those adjustments that were made to non BCMR charge controlled markets. We have then applied this proportion to the amount of costs moved out of the charge controlled BCMR market to produce our estimate. A number of caveats need to be recognised. First, the estimate does not take account of inflation, efficiency and volume movements. Second, the individual adjustments are all net of various intra market reallocations, both positive and negative. Third, NGA moved from residual to WLA in 2014/15. Therefore, it has not been possible to reallocate that market in 2013/14 and 2012/13.

⁴²¹ In the specific circumstances of the cost reallocations to other charge controlled markets, the consideration applied to the SCA would similarly apply to the first-year impact of the basket X.

the profit gap attributable to factors other than volumes and efficiency or BT's cost re-attributions to other charge controlled markets, plus one third of the volumes and efficiency outperformance (which would normally be subject to glide path in year one). This leads to a maximum SCA of -22% with a resulting X of -9.75%⁴²² (reflecting the effects of rounding). This combination of SCA and X would reduce the profit gap by approximately 75% in the first year of the control. In contrast, a glide-path only approach would lead to a basket X of -17.0% and a reduction in the first year profit gap of 43%. This leaves a judgment to be made between making reductions to first year prices of between 17.0% (glide-path only) and 29.9% (maximum reduction by the combination of SCA and X). We make this judgment by deciding on the level of the SCA (subject to the above limit). The corresponding basket X is calculated so that charges are brought into line with costs in the final year of the control.

7.87 While we place significant weight on the consumer benefit of a SCA for Ethernet services, we consider it appropriate not to set the SCA at the top of the above range, given our considerations above and summarised below:

- We consider that setting a SCA at the maximum of the above range would signal a move towards a rate of return model, adjusted only to ring-fence the profits that are due to specified factors, which we seek to avoid. We consider that this could set a damaging precedent which may undermine confidence in our incentive regulation approach.
- We have taken account of the margin of error inherent in attributing profitability to any one source (see above the description of our approach to estimating the impact of volumes and efficiency outperformance and cost re-allocations).

7.88 Reflecting this balance of emphasis, we have decided to make a -12% SCA⁴²³ for Ethernet services. We note that a -12% SCA for Ethernet services results in a basket X of -13.25%, producing a combined first-year revenue impact of -23.7%.⁴²⁴ This ensures that the incentive effects of the glide path and BT's opportunity to recover its efficiently incurred costs remain intact, as the majority of the profit gap – sufficiently above the estimated effects of BT's cost re-attributions to other regulated markets in previous years and the estimated effect of volumes and efficiency outperformance – will be closed by a glide path over the control period.⁴²⁵

We consider the appropriate value of the SCA for the TI basket is -9%

7.89 For TI services, we forecast that, in the absence of the charge control, BT would earn returns in excess of its WACC of £69m, of which £26m is explained by cost reallocations to other charge controlled markets and volume and efficiency

⁴²² The first-year price reduction due to the basket X, if combined with a SCA, is less than the percentage X because the X is applied to prices (and revenues) only after they have been reduced by the application of SCA.

⁴²³ I.e. to require BT to reduce its average charges for the Ethernet basket by 12% on the first day of the 2016 control (i.e. 01 May 2016).

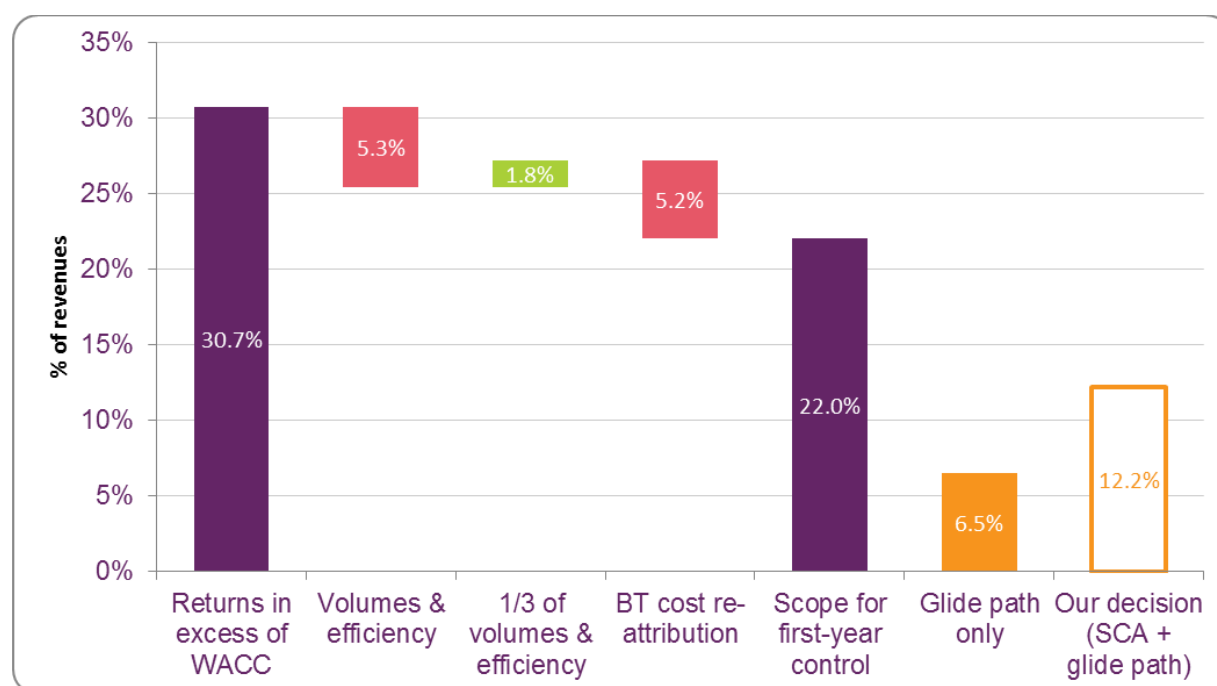
⁴²⁴ A £177m reduction, corresponding to 60% of the first year's profits in excess of WACC

⁴²⁵ We note that the revenue impact of the SCA is greater than the error corrections and cost re-attributions identified by the 2016 CAR totalling £51.5m.

outperformance. This gives a potential maximum scope for a reduction of £50m⁴²⁶ in year of the control.

- 7.90 The decline in TI volumes means that we forecast the gap between BT's ROCE and its WACC would narrow significantly over the control if nominal prices were unchanged. This means that a very high SCA could be followed by nominal price increases as TI unit costs rise. For example, reducing charges to costs plus the estimated effect of the cost reallocations to other charge controlled markets and two-thirds of BT's volumes and efficiency outperformance in the first year of the control would mean a SCA of -24% followed by a glide path of CPI +2.50% necessary to bring charges into line with the (increased) costs in the final year of the control. We consider that such discontinuities would be confusing and disruptive for end customers and are to be avoided. We therefore consider that the value of any SCA should not be so large that nominal prices increases are needed in later years.
- 7.91 The level of CPI inflation over the duration of our control is uncertain. Given the expected average inflation of 1.7% over the control period, we consider a -3.5% basket X is appropriate to ensure nominal price increases are unlikely.⁴²⁷ This implies a maximum SCA of -9%. Based on our analysis, a combination of SCA and basket X for TI services within this range would close up to 40% of the forecast returns in excess of WACC in the first year of the control. This is less than the proportion of returns in excess of WACC we estimate is unrelated to volumes and efficiency outperformance and BT's cost reallocations to other charge controlled markets (66%). Hence, we consider that this SCA and basket X will not undermine BT's opportunity to recover its efficiently incurred costs. This is illustrated on Figure 7.3.

Figure 7.3: Summary of analysis of the first year impact of SCA and X for TI services



⁴²⁶ This includes one-third of the estimated impact of volumes and efficiency outperformance, which would normally be subject to a glide path in the first year of the control.

⁴²⁷ In the November 2015 Bank of England Inflation Report, 3.5% is at the high end of Bank of England's central range, i.e. inflation is only expected to exceed this level with 20% probability.

<http://www.bankofengland.co.uk/publications/Documents/inflationreport/2015/nov.pdf>

Source: Ofcom analysis of BT data

- 7.92 A -9% SCA for TI services corresponds to a revenue impact of approximately £20m (or 29%) of BT's returns in excess of its cost of capital in the first year of the 2016 LLCC. This value of SCA, together with the resulting X of 3.5%, makes it likely that a steep one-off price reduction followed by nominal price increases in the subsequent years will be avoided. Together with the values of SCA and X for Ethernet services, these values ensure that the relative charges for Ethernet services versus TI services will decline over the 2016 LLCC, which we consider is consistent with efficient migration signals.

We will implement the Ethernet and TI SCAs on 1 May 2016

- 7.93 The SCAs for the Ethernet basket and the TI basket, as well as the relevant sub-baskets will be made on the first day of the charge control period. We have provided BT with flexibility to implement these starting charge adjustments, subject to the sub-baskets and sub-caps discussed in Volume II Sections 5 and 6 of this statement, meaning that it does not need to reduce the price of each individual Ethernet service by 12% and each individual TI service by 9%. Instead, it can focus price reductions on particular services, so long as the weighted reduction is equal to 12% for Ethernet and 9% for TI services. This is consistent with our decision to impose broad baskets. There are some Ethernet services, however, that will be reduced by 12% at the start of the control. We discuss these in our decisions for sub-baskets and sub-caps in Section 5.
- 7.94 However, in order to ensure consistency between our sub-baskets and the starting charge adjustment, we also propose that 2Mbit/s RBS, NetStream and SiteConnect services should be reduced by at least 9% at the start of the control period. Without this constraint, BT may implement the starting charge adjustment in a way that benefits PPC customers rather than RBS customers.⁴²⁸ Similarly, our proposal for a CPI-CPI sub-cap on all charges will also apply to the starting charge adjustment such that, when implementing the latter, BT will not be able to increase any charge in nominal terms.
- 7.95 As set out in Section 9, in assessing compliance with the SCA, the same revenue weights will apply that are used to comply with the basket X in the first year of the control.

Stage 5: Calculate the value of X for the basket(s) of services

- 7.96 Having set out our decisions for Stages 1 to 3 of our methodology for the Ethernet and TI baskets in Sections 5 and 6 respectively and in relation to Stage 4 in the above paragraphs, below we set out our decisions on the values of X for the Ethernet and TI baskets.

June and November 2015 LLCC Consultation

- 7.97 In the June 2015 LLCC Consultation we proposed a base case value of X for the Ethernet basket of CPI-13.75%, with a range of CPI-9.75% to CPI-17.75% and a

⁴²⁸ We consider that this risk is still relevant despite the recent decision by the CMA to approve the merger between BT and EE. We have explained the reasons for this in Volume II Section 6.

base case value of X for the TI basket of CPI-12.25%, with a range of CPI+-6.25% to CPI-14.25%.

- 7.98 In the November 2015 LLCC Consultation, given the issues raised in the consultation, we revised the base case value of X for the Ethernet basket of CPI-12.50%, with a range of CPI-6.50% to CPI-14.50% and a base case value of X for the TI basket of CPI-3.50%, with a range of CPI+2.50% to CPI-5.50%.

Stakeholders' comments

- 7.99 Only BT commented directly on the base case values of X and ranges in response to the November 2015 LLCC Consultation. BT did not agree with Ofcom's revised X values for either the Ethernet⁴²⁹ or the TI⁴³⁰ baskets as it considered them too low.⁴³¹

Our conclusions

- 7.100 We note BT's comment on the values and all other comments from stakeholders in response to our proposals set out in the June and November 2015 LLCC Consultation. As a result of these comments, additional evidence and our further analysis, we have revised a number of our assumptions and approaches as discussed in Volume II of this statement. On the basis of the inputs and assumptions set out in this statement, we have forecast the costs of services in the Ethernet and TI basket for each year of the charge control. We have forecast revenues in the absence of a charge control using 2015/16 prices and volume forecasts for the charge control period. We have calculated the X values so as to bring forecast revenues in line with forecast costs by the final year of the charge control (2018/19).⁴³² Based on the reasoning outlined in this Statement, we have set the value of X for the Ethernet and TI baskets to be -13.25% and -3.50% respectively. These values are within the ranges we published in our November 2015 LLCC Consultation.

⁴²⁹ It believed that the base case X should be -9.1% with a SCA of 1.8%.

⁴³⁰ It believed that the X should allow price increases of CPI + 2.5%.

⁴³¹ BT's reasoning for believing them too low is set out throughout Volume I of this statement.

⁴³² When calculating revenues and costs in 2018/19, we do so in real terms using 2015/16 prices.

Section 8

Controls for Accommodation, Excess Construction and Time Related Charges

Introduction

- 8.1 In order to use the regulated wholesale services that BT provides in the leased lines markets, CPs require certain ancillary services such as accommodation products or, on occasion, construction work or services outside Openreach's terms of service. Accommodation services such as space and power in BT's local exchanges are necessary ancillary services. Similarly, ECCs are necessary to allow access network extensions that are specific to an individual customer. TRCs are services such as faults repair, providing or rearranging services where the work is not covered within Openreach's terms of service. In Section 8, 10 and 12, Volume I, we have decided that it is appropriate to apply a price control to these services.
- 8.2 In this section, we summarise the consultation proposals and responses received and then set out our charge control decisions for Accommodation products, ECCs, and TRCs.⁴³³

Summary of our key decisions

- 8.3 We have decided to treat the Ethernet and TI accommodation products that overlap with LLU Co-Mingling products the same as the LLU Co-Mingling products. The June 2014 FAMR Statement's charge control for the Co-Mingling (New Provides and Rentals) basket continue to apply regardless of whether they are used by CPs for leased line products or for LLU. For Access Locate, a service that falls outside of the regulation above, we impose a price cap of CPI-0%.
- 8.4 BT provides both Ethernet and TI ECCs in two ways, either through its own staff (Direct ECCs) or through contractors (Contractor ECCs). We consider that some Direct ECCs are out of line with the underlying costs of provision. Therefore, we have decided to impose glide path controls on the charges as set out in Table 8.1.⁴³⁴

⁴³³ For the avoidance of doubt, where we discuss these terms, we refer to ECCs and TRCs specific to leased line services.

⁴³⁴ These numbers have been updated since the June 2015 LLCC Consultation to reflect the most recent data received from BT

Table 8.1: Direct ECCs controls

Charge	Control
Blown fibre	CPI-18.75%
Cable (fibre or copper)	CPI+17.25%
Blown fibre tubing in duct	CPI+8.75%
Internal cabling	CPI+11.75%
Survey fee/Planning charge	CPI-3.25%

Source: Ofcom forecasts

- 8.5 We have decided to impose a basis of charges obligation on BT for Contractor ECCs. This requires BT to ensure that the price of any ECCs that are provided through contractors are based on the charge paid to the contractor by BT, plus BT's relevant incremental costs, plus an appropriate mark-up for common costs.
- 8.6 Since May 2014, BT includes an additional £548 balancing charge as part of the EAD connection charge.⁴³⁵ This means that EAD customers face a higher average connection fee, in return for being exempted from ECCs⁴³⁶ up to £2,800. We have decided that BT should be given flexibility to continue to charge in this way and we have allowed BT to change the balancing charge of £548, but not the threshold charge which exempts the first £2,800 of new provisions of EAD services.
- 8.7 Finally, we have decided that the costs of providing Ethernet TRCs are broadly in line with current charges. So, we have decided to not make a starting charge adjustment at this time but Ethernet TRCs will be controlled by applying a -0.15% index to current prices over the next charge control period.

Accommodation services

Background

- 8.8 Accommodation services such as space and power in BT's local exchanges are a necessary ancillary service.
- 8.9 Openreach currently provides two types of accommodation services: Co-mingling and Access Locate. Co-mingling is exclusively provided in support of LLU while Access Locate enables CPs to put site-specific communications equipment in BT's exchanges.
- 8.10 Access Locate and LLU Co-mingling services are currently charged at the same price.⁴³⁷ This is because a number of overlapping Ethernet and TI accommodation

⁴³⁵ The full list of EAD products affected by this direction is available at <http://stakeholders.ofcom.org.uk/binaries/consultations/excess-construction-charges/statement/excess-construction-charges-statement.pdf>

⁴³⁶ This includes both Direct ECCs and Contractor ECCs

⁴³⁷ Openreach, *Price List, Access Locate and Access Locate Plus*, <https://www.openreach.co.uk/orpg/home/products/pricing/loadProductPriceDetails.do?data=q%2B2vp>

products are currently treated the same as LLU Co-Mingling products and regulated by the charge control set in the June 2014 FAMR Statement. This states that the Co-Mingling (New Provides and Rentals) basket will continue to apply regardless of whether the accommodation products are used by CPs for leased line products or for LLU.⁴³⁸

June 2015 LLCC Consultation

- 8.11 In the June 2015 LLCC Consultation, we proposed to treat the Ethernet and TI accommodation products that overlap with LLU Co-Mingling products the same as the LLU Co-Mingling products. We proposed that the June 2014 FAMR Statement's charge control for the Co-Mingling (New Provides and Rentals) basket would apply to all accommodation products regardless of whether they are used by CPs for leased line products or for LLU. For Access Locate and Cablelink (the two services that fall outside of the June 2014 FAMR Statement's charge controls), we proposed a price cap of CPI-0%.

Stakeholders' comments

- 8.12 All four respondents who commented on our proposal (i.e. BT, [3], GTC and Vodafone) agreed with our proposed charge controls for accommodation services.
- 8.13 BT and GTC agreed that we should maintain a common charge control for accommodation services as defined in the June 2014 FAMR Statement. BT also considered that the charge control defined in the June 2014 FAMR Statement should continue to apply regardless of whether the accommodation products are used by CPs for leased line products or for LLU and that no additional price control on overlapping products should be introduced. Additionally, BT agreed with a CPI-0% price cap control for the Access Locate Administration Fee and for Cablelink. BT considered that the proposed controls enable BT to recover costs and make any necessary small adjustments reflecting an increase in costs to existing pricing for both the Access Locate Administration Fee and Cablelink.
- 8.14 Vodafone considered that alignment with the LLU charge control was sensible from an administrative perspective as accommodation is used to support services in both markets.

Our conclusions

Accommodation products that overlap with LLU Co-Mingling products

- 8.15 We have decided to adopt a similar approach as the March 2013 BCMR Statement, which sought to avoid the undesirable situation where overlapping products would be subject to two different charge controls. As such, we have not placed any additional price control on these overlapping products; instead, we have decided to require Openreach to price accommodation products used for leased lines the same as for

[fgQQ99SiimXeC7QjskLe4HVN3IVHU%2BmY7RLKoBZ6rNZujnCs99NbIKJZPD9hXYmijxH6wrCQm97GZMyQ%3D%3D](#) (Access Locate Price List).

⁴³⁸ Ofcom, *Fixed access market reviews: wholesale local access, wholesale fixed analogue exchange lines, ISDN2 and ISDN30 – Volume 2: LLU and WLR Charge Controls, Statement*, 26 June 2014, Volume II, Paragraphs 4.311-4.314

<http://stakeholders.ofcom.org.uk/telecoms/ga-scheme/specific-conditions-entitlement/market-power/fixed-access-market-reviews-2014/statement/>.

LLU Co-Mingling. We have received no evidence from stakeholders to suggest an alternative approach would be more appropriate.

Access Locate Administration Fee

- 8.16 The Access Locate Administration Fee is payable by LLU operators who want to convert their Revised agreement for Access Network Facilities (RANF) to Access Locate and is not regulated by the June 2014 FAMR Statement's charge controls.
- 8.17 The current Access Locate Administration Fee (£215) is the same as it was at the time of the March 2013 BCMR Statement.⁴³⁹ Given the stakeholder comments⁴⁴⁰ we continue to consider a CPI-0% cap is the most proportionate approach to allow cost recovery while preventing excessive pricing. We are therefore imposing a CPI-0% price cap on these services.

Dark Fibre

June 2015 LLCC Consultation

- 8.18 We proposed that the existing charging arrangements for (active) network extensions would provide the most suitable solution for the dark fibre service. Specifically, that accommodation costs, the proposed controls applied to active services and access arrangements for accommodation services should also apply to the dark fibre service.⁴⁴¹

Stakeholders' comments

- 8.19 Stakeholders who responded to the June 2015 LLCC Consultation did not raise any specific questions or produce any evidence concerning whether active and passive accommodation costs might differ.⁴⁴²

Our conclusions

- 8.20 We would not expect there to be a difference between accommodation services required by CPs who purchase active products and accommodation services required by CPs who purchase dark fibre. We would therefore expect the same services and prices to apply whether used alongside dark fibre or active products.
- 8.21 However, we do recognise that the dark fibre remedy has not yet been fully designed or implemented, and so there is a degree of uncertainty about what would be required. Therefore to the extent that negotiations around the dark fibre product design reveal any objectively justifiable differences between accommodation services for active products and dark fibre, we would expect these to be reflected in the charges on the basis of long run incremental cost differences.

⁴³⁹ The name of this charge is 'License conversion from RANF to Access Locate', see Access Locate Price List.

⁴⁴⁰ Following the receipt of BT's latest cost estimates, we have decided to include Cablelink in a sub-basket with interconnection services - see Section 5.

⁴⁴¹ Ofcom, *Business Connectivity Market Review: Leased lines charge controls and dark fibre pricing, Consultation*, 12 June 2015, P.144-145

<http://stakeholders.ofcom.org.uk/consultations/llcc-dark-fibre/>

⁴⁴² For a more in depth review of potential cost differences between actives and passive products please review Annex 33

Excess Construction Charges

Background

8.22 Openreach levies ECCs when construction work is required to deliver a new leased line connection. It covers activities such as site survey, installation of new duct, blown fibre, drilling through walls and provision of a footway box.

2013 LLCC

8.23 In the March 2013 BCMR Statement, we did not consider it appropriate to include ECCs in the main Ethernet or TI baskets for three reasons⁴⁴³:

- ECCs share very few common costs with Ethernet or TI services as they are mostly construction costs;
- the anticipated future trend of the costs is different to other Ethernet and TI services; and
- ECCs represent a low value compared to the overall Ethernet basket⁴⁴⁴, meaning that putting them in a combined basket would not effectively control their prices without an additional sub-cap.

8.24 BT continues to charge a unit price for each ECC.⁴⁴⁵ In the March 2013 BCMR Statement, the evidence we obtained indicated that, with the exception of surveys, all of BT's ECC activities were contracted out and that BT was earning a weighted average margin of around 30%.⁴⁴⁶ As these margins appeared to be based on a pass-through of BT's contractor costs plus a mark-up, we did not consider that there were sufficiently strong reasons to justify a glide path as there were unlikely to be any efficiency or innovation gains.⁴⁴⁷ We therefore brought charges into line with costs via starting charge adjustments on each ECC activity.

8.25 We also imposed a separate control of GBCI-0% on each and every ECC during the charge control period.

⁴⁴³ Ofcom, *Business Connectivity Market Review, Review of retail leased lines, wholesale symmetric broadband origination and wholesale trunk segments, Statement*, 28 March 2013, paragraph 22.65 <http://stakeholders.ofcom.org.uk/consultations/business-connectivity-mr/?a=0>

⁴⁴⁴ We compare ECC revenues to the overall Ethernet basket, as in practice, the overwhelming majority of ECCs and revenues are driven by demand for Ethernet services rather than TI. Additionally, Openreach provide TI ECCs on behalf of Wholesale.

⁴⁴⁵ Openreach, *Price List, Excess Construction Charges*, <http://www.openreach.co.uk/orpg/home/products/pricing/loadProductPriceDetails.do?data=pAWshrQ7XRSLb9S%2BW8IAk0G8vUtdrJtUevDC2QqJZ8IMnGHsqdC0vzO163bJmh34D91D7M0q8u%2FIISgtIFAKw%3D%3D> (ECC Price List).

⁴⁴⁶ Ofcom, *Business Connectivity Market Review, Review of retail leased lines, wholesale symmetric broadband origination and wholesale trunk segments, Statement*, 28 March 2013, Paragraphs 22.30-22.31 <http://stakeholders.ofcom.org.uk/consultations/business-connectivity-mr/?a=0>

⁴⁴⁷ Ofcom, *Business Connectivity Market Review, Review of retail leased lines, wholesale symmetric broadband origination and wholesale trunk segments, Statement*, 28 March 2013, Paragraphs 22.48-22.51 <http://stakeholders.ofcom.org.uk/consultations/business-connectivity-mr/?a=0>

May 2014 ECC Direction

- 8.26 In May 2014, we issued a direction that allowed Openreach to exempt new provisions of EAD services from the first £2,800 of ECCs (the threshold charge) and to make up the resulting loss of its revenue with a balancing charge of £548 (the balancing charge), which would be part of the standard connection charge for all other EAD new provisioning services.⁴⁴⁸ The rationale for this was that the change would significantly reduce the lead times for provisioning of most of the EAD orders which incur ECCs. We also carried out an analysis that showed the change would have no net impact on Openreach's revenues, i.e. the change was 'revenue-neutral'.

Approach to controlling ECCs

June 2015 LLCC Consultation

- 8.27 In June, we explained that Direct ECCs⁴⁴⁹ were out of line with the underlying costs of provision and therefore, we proposed to impose glide path controls on the charges in Table 8.2.

Table 8.2: Proposed Direct ECCs controls – June 2015 LLCC Consultation

Charge	Control
Blown fibre	CPI-21%
Cable (fibre or copper)	CPI+8.25%
Blown fibre tubing in duct	CPI+4.5%
Internal cabling	CPI+7%
Survey fee/Planning charge	CPI+5%

Source: Ofcom

- 8.28 We explained that Contractor ECCs⁴⁵⁰ were reflective of the costs of provision and did not therefore propose any starting charge adjustments; instead we proposed a safeguard cap of GBCI-0%.
- 8.29 We also proposed to continue to apply the approach set out in the May 2014 ECC Direction, modified to allow BT additional flexibility to change the balancing charge of £548, but not the threshold charge which exempts the first £2,800 of new provisions of EAD services. Our proposal sought to ensure cost recovery and revenue neutrality.

⁴⁴⁸ Ofcom, Excess Construction Charges for Openreach Ethernet Access Direct, <http://stakeholders.ofcom.org.uk/binaries/consultations/excess-construction-charges/statement/excess-construction-charges-statement.pdf>

⁴⁴⁹ Direct ECCs refer to activities that are carried out by BT (i.e. using internal direct labour and materials).

⁴⁵⁰ Contractor ECCs refer to activities that are carried out by a contractor that is external to BT.

Stakeholders' comments

- 8.30 Vodafone, [redacted], NATS and UKCTA supported price controls for ECCs.
- 8.31 UKCTA did not agree with our proposals for Direct ECCs. It argued that we proposed to allow significant increases in costs above CPI for some ECCs, without providing sufficient justification. It gave the example of blown fibre tubing in duct, which it argued is not an overly resource intensive task.
- 8.32 GTC stated that Ofcom should continue to monitor the provision of ECCs to ensure that prices are consistent with costs.
- 8.33 BT agreed with our proposals for charge controls for Direct ECCs. However, BT argued that its contractor costs are likely to continue to increase in line with market rates, that it is currently incurring an average loss of [redacted] in contractor costs per job based on ECCs,⁴⁵¹ and that our proposed price reductions in Direct ECCs will further increase BT's losses by reducing the average price per job by [redacted]. This would result in an average loss in total of [redacted].

Our conclusions

We have decided to impose glide path controls on Direct ECCs

- 8.34 Following comments received in response to our June 2015 LLCC Consultation, we requested further details from BT of its costs of providing ECCs, including Direct ECCs and Contractor ECCs.
- 8.35 As BT provides Direct ECCs using its own labour, we set the charge control for Direct ECCs on the basis of BT's costs of provision. This approach is consistent with our approach to the main Ethernet and TI baskets, in which we base the control on BT's costs of provision.
- 8.36 The unit cost estimates are based on four main cost types:
- direct labour costs – the costs associated with BT employees directly undertaking ECC activities. These were calculated based on actual salary and FTE data;⁴⁵²
 - direct overheads – these costs are those associated with vehicle lease, communications and tools used by the employees undertaking ECC activities. These were calculated based on actual spend and charges;⁴⁵³
 - stores – these are costs associated with key materials such as cable, fibre, poles, frames, covers etc. BT used actual unit store costs from Openreach Procurement to calculate these;⁴⁵⁴ and
 - other overheads - BT also included a [redacted] overhead which it claims converts the unit labour cost to a FAC estimate. BT calculated the overhead based on data for TRCs in the 2013/14 RFS. BT applied a similar overhead to the external

⁴⁵¹ BT response to June 2015 LLCC consultation, paragraph 308

⁴⁵² BT response to 15th s135 notice dated 28 April 2015, Question B2.

⁴⁵³ BT response to 15th s135 notice dated 28 April 2015, Question B2.

⁴⁵⁴ BT response to 15th s135 notice dated 28 April 2015, Question B3.

contractor costs to generate the total unit costs, but at a lower rate [§].⁴⁵⁵ In our June 2015 LLCC Consultation, we decided that overheads for both Direct and Contractor ECCs should be set at the lower rate of [§]. We understand that this is because the external overhead uplift excludes costs that BT does not incur when contractors carry out activities, such as fleet rental, computing and systems software.⁴⁵⁶

- 8.37 Based on the information provided by BT, its costs of providing Direct ECCs (excluding surveys) have increased since our June 2015 LLCC Consultation. This leads to higher (or in the case of blown fibre, less negative) values of X for Direct ECCs (excluding surveys). [§].
- 8.38 [§].⁴⁵⁷ This increase has been partly caused by [§], partly by [§], and partly by [§].⁴⁵⁸
- 8.39 In the June 2015 LLCC Consultation we considered that BT's estimates for the costs of stores appeared to be reasonable. We also considered that BT should apply the same (lower) mark-up⁴⁵⁹ for Direct Overheads⁴⁶⁰ as they applied to External Overheads [§]. BT's updated cost data shows very small changes to BT's stores costs for some Direct ECCs, and we consider that these updated figures are reasonable. In the updated data received from BT⁴⁶¹, it updated its level of overheads to a lower figure of [§]. We have therefore incorporated these updated figures into our models when determining the appropriate level for Direct ECC charges.
- 8.40 In the June 2015 LLCC Consultation we also considered whether to bring Direct ECCs in line with costs at the start of the period, i.e. via a starting charge adjustment, or at the end of the period, via a glide path. We believe that the latter is more appropriate, as it is consistent with the framework set out in Section 4. Given that Direct ECCs are mostly carried out by BT labour and incur internal overheads, a glide path will provide BT with incentives to improve efficiency over the control period.
- 8.41 In order to calculate the X for each internal activity, we have followed the same analytical approach as our Ethernet and TI basket models (set out in Annex 26):
- we take the current unit cost and split this by labour (pay opex), overheads (non-pay opex) and capital expenditure;

⁴⁵⁵ This is an update of the overhead rate BT estimated in the March 2013 BCMR Statement, which was [§].

⁴⁵⁶ BT response to 15th s135 notice dated 28 April 2015, Question B6.

⁴⁵⁷ We asked BT to demonstrate the reasons for the increase in the man-hour rate between the June 2015 LLCC Consultation and the updated data provided in response to our information requests.

⁴⁵⁸ BT response to 26th s135, received on 10th December 2015, and BT response to 31st s135, received on 24th December 2015 and BT's response to follow up questions received on 28th January 2016 with the answers confirmed in our 33rd s135.

⁴⁵⁹ This mark-up is calculated as a percentage of unit costs

⁴⁶⁰ Although ECCs share few common costs with other Ethernet and TI services, direct overheads are those costs associated with vehicle lease, communications and tools used by the employees undertaking ECC activities. We understand that BT used information on actual spend and charges to estimate these costs;

⁴⁶¹ BT response to 26th s135 notice dated 10 December 2015

- we use the Ethernet basket assumptions⁴⁶² for input prices changes⁴⁶³ and efficiency to forecast unit costs over the charge control period;
- we assume that BT's current prices will remain the same during the next charge control period; and
- we calculate the X based on forecast charges and costs in the final year of the control (both revenues and costs in the final year are expressed in real terms based on 2015/16 prices).

8.42 Our revised Direct ECC controls based on the updated data are show in Table 8.3 below.

Table 8.3: Direct ECCs controls

Charge	Control
Blown fibre	CPI-18.75% ⁴⁶⁴
Cable (fibre or copper)	CPI+17.25%
Blown fibre tubing in duct	CPI+8.75%
Internal cabling	CPI+11.75%
Survey fee/Planning charge	CPI-3.25%

Source: Ofcom forecasts

We have decided to impose a basis of charges obligation for Contractor ECCs

- 8.43 Following responses to the June 2015 LLCC Consultation, we requested evidence from BT regarding its current contractual arrangements for Contractor ECCs and any anticipated changes to these arrangements over the upcoming control period.
- 8.44 This information shows that contractor costs for the provision of ECCs are subject to review and potential changes over the period of the control. This uncertainty makes it difficult to accurately forecast the costs of these services over the charge control period.
- 8.45 Therefore, we consider that there is a significant risk of over- or under-recovery by BT if we were to attempt to set prices for Contractor ECCs for the control period, as we proposed in the June 2015 LLCC Consultation. Setting a charge control in these circumstances would likely carry an undue risk of regulatory failure. We consider that a basis of charges obligation is a more effective way to keep charges in line with costs over the control period.⁴⁶⁵

⁴⁶² The vast majority of leased line ECC revenues are generated from Ethernet services.

⁴⁶³ We apply changes in the price of pay to direct labour (3.0%), non-pay price changes to overheads (2.1%) and asset price changes to stores (0%).

⁴⁶⁴ With regards to UKCTA's comment, we note that this value of X on blown fibre will lead to a significant fall in blown fibre prices over the control period.

⁴⁶⁵ In our FAMR 2014 Statement, we adopted a similar approach in relation to electricity costs. <http://stakeholders.ofcom.org.uk/telecoms/ga-scheme/specific-conditions-entitlement/market-power/fixed-access-market-reviews-2014/statement/>

- 8.46 Under the 2013 LLCC, we regulated the prices of ECCs provided through contractors. These prices were calculated as the rates charged to BT by BT's contractors, to which was added the relevant costs that BT incurs in providing these ECCs (e.g. wayleaves), and an appropriate allocation of common costs. We consider that this remains an appropriate approach to calculate the price of contractor ECCs and the basis of charges obligation requires BT to set charges on this basis. As a starting point, we consider that BT should apply the same percentage mark-up to Contractor ECCs as is applied to Direct ECCs ([§<]). We would expect this to remain the case for the duration of the control unless BT had evidence to demonstrate that a different level of overheads would be more appropriate.
- 8.47 We have considered the impact of our approach on BT's incentives to contract efficiently given that it is able to pass-through any charges directly as opposed to being subject to a price cap. However, we consider that any impact will be limited, since BT Wholesale is a significant purchaser of Contractor ECCs. This means that any increases in the price of Contractor ECCs will impact the ability of BT Wholesale to compete with other downstream competitors who own their own infrastructure. On balance, we consider that any potential reduction in productive efficiency due to removing some of the incentives on BT to contract efficiently is likely to be outweighed by the increase in allocative efficiency due to prices being more closely aligned with costs.
- 8.48 If, during the charge control period, BT decides to use contractor staff to provide a type of ECC that would previously have been performed by internal staff, then that type of ECC will become subject to the basis of charges obligation. Conversely, where BT decides to use its own staff to provide a type of ECC previously provided by contractor staff, this charge would continue to be subject to the basis of charges obligation until the end of the control period.
- 8.49 We are not imposing a specific reporting requirement on BT; instead, we are requiring that BT would have to demonstrate that it is complying with the basis of charges obligation on request and retain appropriate data to do this.
- 8.50 In the June 2015 LLCC Consultation we proposed to use GBCI as our index for Contractor ECCs. BT disagreed with our proposals to use GBCI, raising various arguments in support. Given that we have decided to impose a basis of charges obligation on BT for Contractor ECCs, it is no longer necessary to use an index to control these charges.

We have decided to allow BT the flexibility to adjust its balancing charge while keeping the threshold charge fixed

- 8.51 As discussed above, the May 2014 ECC Direction allowed BT to impose a balancing charge of £548 on all EAD connections. This meant that all ECCs up to £2,800 (the threshold charge) were exempt, while the customer paid for any costs above this threshold.
- 8.52 Our analysis in the May 2014 ECC Direction showed that the balancing charge of £548 and the exception threshold of £2,800 were consistent with revenue neutrality, in that the revenues BT earned from ECCs were set to be the same under the new charging structure as under the old structure. Revenue neutrality is important to ensure BT has the opportunity to recover its efficiently-incurred costs.

- 8.53 For the purposes of complying with the 2013 LLCC, in the May 2014 ECC Direction we allowed BT to exclude the £548 charge from its published price list for EAD connections.⁴⁶⁶

June 2015 LLCC Consultation

- 8.54 In the May 2015 BCMR Consultation, we explained that since the new ECC charging arrangements had been in place there had been a reduction in the number of orders subject to Direct ECCs and the rate of cancellations and 'deemed consent' delays had fallen.⁴⁶⁷ We also noted that the majority of stakeholders had thus far been supportive of the new arrangements.⁴⁶⁸ We therefore took account of these charging arrangements in our proposals for ECCs.
- 8.55 In the June 2015 LLCC Consultation we considered that if the incidence or distribution of ECC charges changed from those observed in the May 2014 ECC Direction decision, BT might not maintain revenue neutrality.⁴⁶⁹ We therefore proposed that to mitigate against this risk BT should be afforded some flexibility to adjust the balancing charge. We did not consider that allowing BT to adjust the balancing charge and the threshold charge represented a reasonable balance between allocative efficiency and improving the provision of leased lines.

Stakeholders' comments

- 8.56 BT agreed with our proposal to allow it to retain the flexibility to withdraw the £2800 exemption at any time. It also agreed with our proposal to allow BT the flexibility to change the balancing charge of £548.⁴⁷⁰
- 8.57 BT disagreed with our proposal to fix the threshold charge at £2800 over the control period. BT argued that it would be more appropriate to have the flexibility to change the threshold charge in addition to the balancing charge on an annual basis as ECC costs or circuit demand change.⁴⁷¹

Our conclusions

- 8.58 In Section 10, Volume I, we have explained that since the new ECC charging arrangements have been in place there has been a reduction in the number of orders subject to Direct ECCs and the rate of cancellations and 'deemed consent' delays have fallen.⁴⁷² We also noted that the majority of stakeholders have thus far been

⁴⁶⁶ For example, although BT's current connection charge for an EAD 100Mbit/s circuit is £1,950, when calculating the percentage change and accrued revenue for compliance, BT uses a charge of £1,402.

⁴⁶⁷ Ofcom, May 2015 BCMR Consultation, Paragraphs 10.40-10.45

⁴⁶⁸ http://stakeholders.ofcom.org.uk/binaries/consultations/bcmr-2015/summary/BCMR_Sections.pdf

⁴⁶⁹ Ofcom, Excess Construction Charges for Openreach Ethernet Access Direct, Direction", 16 May 2014, Paragraph 1.8 <http://stakeholders.ofcom.org.uk/binaries/consultations/excess-construction-charges/statement/excess-construction-charges-statement.pdf>

⁴⁷⁰ For example, if the proportion of customers requiring an ECC increases (decreases) or if the average dig distance increases (decreases) then BT's costs will increase (decrease). If the balancing charge and the exception threshold remain fixed then BT's revenues will not increase (decrease) in line with costs, meaning that it is not revenue neutral and BT will under-recover (over-recover) its costs.

⁴⁷¹ BT response to the June 2015 LLCC consultation, paragraph 302

⁴⁷² BT response to the June 2015 LLCC consultation, paragraph 302

⁴⁷³ Paragraph 10.106, March 2016 BCMR Statement.

supportive of the new arrangements.⁴⁷³ We therefore have taken account of these charging arrangements in our decision for ECCs.

- 8.59 Our analysis in the May 2014 ECC Direction showed that the balancing charge of £548 and the exception threshold of £2,800 were consistent with revenue neutrality, in that the revenues BT earned from ECCs were set to be the same under the new charging structure as under the old structure. Revenue neutrality is important to ensure BT has the opportunity to recover its efficiently-incurred costs.
- 8.60 However, revenue neutrality might not be achieved going forward if the incidence and/or the distribution of ECCs changes from those observed when implementing the May 2014 ECC Direction.
- 8.61 Since our June 2015 LLCC Consultation, we undertook some further analysis to assess whether the distribution of ECCs below and above the threshold charge had changed over time. We also looked at whether significant price increases or decreases to LLCC ECCs would change the distribution of ECCs.
- 8.62 We have found that the distribution of ECCs had not changed significantly over time and that a large increase or decrease in the price of ECCs only had a small impact on the distribution of ECCs.
- 8.63 We continue to believe that it is appropriate to allow BT the flexibility to adjust the balancing charge to allow cost recovery and revenue neutrality. However, our analysis indicates that it is not necessary to provide BT with the flexibility to adjust both the balancing charge⁴⁷⁴ and the exemption threshold to achieve this aim. We also note that giving BT total flexibility over the exemption threshold could potentially have negative impacts on competition between infrastructure providers. In the May 2014 ECC Direction we set the current threshold, and therefore the implied balancing charge, on the basis that it represented a reasonable balance between allocative efficiency and improving the provision of leased lines, and we did not consider that it was likely to materially adversely affect competition.⁴⁷⁵ We continue to consider this to be the case.
- 8.64 We have therefore decided that BT should be given flexibility to change the balancing charge, but not the threshold charge throughout the control period, in order to ensure cost recovery and revenue neutrality, in the event of some changes in the distribution and incidence of ECCs. However, we have decided that the threshold charge shall remain fixed at £2,800.⁴⁷⁶
- 8.65 In order to ensure that BT uses the flexibility appropriately, BT is required to demonstrate as part of its charge control compliance that its balancing charge is set to ensure revenue neutrality. Many of the difficulties associated with complying with a

⁴⁷³ Paragraph 10.104, March 2016 BCMR Statement.

⁴⁷⁴ Please note that the balancing charge is published in Openreach's ECC Price List and therefore is visible to CPs who will use ECC services, <https://www.openreach.co.uk/orpg/home/products/pricing/loadProductPriceDetails.do?data=pAWshrQ7XRSLb9S%2BW8IAk0G8vUtdrIJTUevDC2QqJZ8IMnGHsqdC0vzO163bJmh34D91D7M0q8u%2FIISgtlFAKw%3D%3D> (ECC Price List)

⁴⁷⁵ Ofcom, Excess Construction Charges for Openreach Ethernet Access Direct, Direction", 16 May 2014, Paragraph 3.15 <http://stakeholders.ofcom.org.uk/binaries/consultations/excess-construction-charges/statement/excess-construction-charges-statement.pdf>

⁴⁷⁶ Unless BT decides to remove the balancing charge and exemption threshold and return to its previous policy of charging for ECCs as they are incurred.

basket control also apply to setting an appropriate balancing charge. For example, ensuring revenue neutrality in the current year requires BT to forecast the incidence and distribution of ECCs.

- 8.66 At the end of each financial year BT should determine what its ECC revenues would have been in the prior period in the absence of a balancing charge for EAD connections, i.e. if all ECCs were charged using the Openreach price list. BT should then divide the 'exempted' ECCs by the number of EAD connections in the prior period to arrive at the new balancing charge, which will be used for the following year. Further details of this calculation are provided in Section 16 and Annex 35.
- 8.67 BT has expressed concerns that using prior year prices would result in under recovery for the first year of the charge control, since the balancing charge formula is calculated on prior year revenues, and BT expects ECC prices to increase in the first year of the charge control period.⁴⁷⁷
- 8.68 We have decided that the balancing charge⁴⁷⁸ should be calculated using prior year weights due to the practical advantages of using prior-year weights rather than in-year weights.⁴⁷⁹ While it is true that in some circumstances, using prior year weights will lead to lower recovery than would be the case if we applied in-year weights, there are circumstances in which prior year weights will lead to a higher recovery than in-year weights. Given the different values of X for different types of Direct ECCs, the price of some products will increase over the charge control period while some will decrease. Therefore, it is not clear whether, on balance, the use of prior year weights rather than in year weights will lead to BT under-recovering in the first year of the charge control.

Dark Fibre

June 2015 LLCC Consultation

- 8.69 In the June 2015 LLCC consultation we noted our proposals for new infrastructure provisioning, including ECCs, which were explained in the May 2015 BCMR Consultation. Specifically, we proposed that the existing charging arrangements for (active) network extensions would provide the most suitable solution for the dark fibre service.
- 8.70 In particular we noted that where construction of new infrastructure is required which is not specific to an individual customer, for example to increase capacity or to repair broken duct, we considered that the arrangements should not differ between active and dark fibre access. With regard to customer specific ECCs, as the ECCs relate to

⁴⁷⁷ Email from Openreach (Bertrand Mazieres) to Ofcom (Adam Lacey), 1 February 2016.

⁴⁷⁸ For the purposes of complying with the 2013 LLCC, in the May 2014 ECC Direction we allowed BT to exclude the £548 charge from its published price list for EAD connections. For example, although BT's current connection charge for an EAD 100Mbit/s circuit is £1,950, when calculating the percentage change and accrued revenue for compliance, BT uses a charge of £1,402. Should BT continue to impose a balancing charge on EAD connections in order to exempt ECCs up to £2,800, we have decided to continue with this approach and, as such, have not included the £548 charge when calculating revenues in the 2016 LLCC Model (Including the ECCs would also require us to incorporate ECC costs in our model which, as discussed above, we do not currently have information for).

⁴⁷⁹ To find a more detailed discussion of our decision to use prior year weights in favour of current year weights, please see Section 9.

dark fibre costs only, we considered that the same ECCs should also apply to both active and dark fibre services.

- 8.71 On BT's balancing charge and exemption threshold for ECCs, we noted BT's arguments that the average balancing charge per order may be inappropriate for dark fibre provisioning as it could lead to gaming of average cost based pricing structure where a CP could choose between self-build and dark fibre.⁴⁸⁰ On this point, we did not think there is a substantial difference between the active and dark fibre remedies with respect to such arbitrage possibilities, given that competing CPs already face a similar trade-off between self-build and renting BT active circuits.
- 8.72 We therefore proposed that if BT wishes to provide the same exemption from a specified value of ECCs, that the same value for dark fibre should be used as for active circuits. However, we noted that the ECC exemption is at BT's discretion and that it is open to BT to withdraw the exemption at any time, or to limit which circuits the exemption applies to. If BT does withdraw the exemption, it would be required to reduce the connection charge by the applicable balancing charge.

Stakeholders' comments

- 8.73 BT agreed that specific charges for individual items billed when performing ECC work should be the same for dark fibre as for active circuits. Therefore, fibre work should be charged at the same rate for both active and passive work.
- 8.74 However, it disputed the application of the ECC exemption to dark fibre. In particular, BT considered there to be a risk that CPs would game the ECC exemption condition and find arbitrage opportunities between self-build and dark fibre (e.g. for high bandwidth circuits), and therefore using an averaged fixed fee could lead to significant losses for BT. Therefore, BT argued that if it were to offer the exemption rule for Dark Fibre, Ofcom should allow it to compute the threshold and balancing charges required for Dark Fibre, and at the very least validate that these are similar to those observed for active circuits, before enforcing that they should be the same.
- 8.75 BT also requested clarification from Ofcom on whether the consultation text⁴⁸¹ which stated that BT has the flexibility to withdraw the exemption, or to limit which circuits the exemption applies to, means that BT has the option to not include the ECC exemption for Dark Fibre while maintaining it for active products.⁴⁸² In particular, BT stated that as Dark Fibre inherently presents additional risk that the fibre strand will not be further reused (because a customer only needs a single Dark Fibre for a given route as further upgrades are made on the electronics), it would want to consider whether the exemption should remain in place for active products only.⁴⁸³

Our conclusions

- 8.76 We consider that the existing charging arrangements for (active) network extensions would provide the most suitable solution for the dark fibre service. In particular:

⁴⁸⁰ BT response to the November 2014 BCMR Passives Consultation, paragraph 7.26.

⁴⁸¹ Ofcom, *Business Connectivity Market Review: Leased lines charge controls and dark fibre pricing, Consultation*, 12 June 2015, paragraph 8.79

<http://stakeholders.ofcom.org.uk/consultations/lcc-dark-fibre/>

⁴⁸² BT response to June 2015 LLCC Consultation, paragraphs 287-291

⁴⁸³ BT response to June 2015 LLCC Consultation, paragraph 164

- where construction of new infrastructure is required which is not specific to an individual customer, for example to increase capacity or to repair broken duct, we consider that the arrangements should not differ between active and dark fibre access and so there should be no additional charge.
- where construction of new infrastructure is specific to an individual customer (i.e. customer specific ECCs), we consider that the same ECCs should also apply to both active and dark fibre services as the ECCs relate to dark fibre costs only.

8.77 To be clear, despite BT's suggestion to the contrary, we consider that the ECC arrangements for dark fibre should mirror those of the active services in order to reduce the risk of inefficient and distorted signals (as per our rationale for aligning dark fibre prices with those of the reference active products, as described in Annex 33). In particular, while BT claims there may be some benefits from the removal of the ECC exemption from dark fibre while maintaining it for active products, we consider there is a significant risk it may result in its own additional distortions of incentives.⁴⁸⁴ Further, although the exemption threshold is based on an average of costs incurred, the ECCs actually incurred for any active circuit cover the full cost of the passive infrastructure deployed (i.e. BT's cost recovery is not dependent upon additional active circuits being provided using that infrastructure). Therefore it is not clear why a customer that only needs a single dark fibre for a given route should lead to additional concerns about losses relative to the active services. As a result, in line with our June 2015 LLCC Consultation, we would not consider it appropriate for BT to seek to have no exemption for dark fibre when it retained one for the reference active products.

8.78 In addition, we consider that the level of the exemption should be the same for actives as dark fibre. BT currently exempts new EAD connections from the first £2,800 of ECCs, which are instead recovered by an increase in the connection charge for all new EAD connections by applying a balancing charge. We note BT's arguments that this approach may not be appropriate for dark fibre, however we do not think there is a substantial difference between the active and dark fibre remedies with respect to such gaming possibilities. This is because competing CPs already face a similar trade-off between self-build and using BT's active circuits (including for high bandwidth circuits). Further, given ECCs relate to passive infrastructure, it is not clear why BT would expect the appropriate level for the exemption threshold to differ significantly for dark fibre compared to active circuits (even if dark fibre was predominantly used for high bandwidth circuits). Indeed, ECCs seek to recover the costs of construction of new infrastructure specific to an individual customer, which this approach should achieve. We therefore consider that if BT provides an exemption from a specified value of ECCs for active circuits, that the same value for dark fibre should be used as for active circuits.

8.79 Finally, as explained above, we have decided to offer BT the flexibility to change its balancing charge. For the avoidance of doubt, the balancing charge should be the same for active and passive ECCs.

⁴⁸⁴ For example, it could lead CPs to buy an active circuit where additional infrastructure build is required (in order to take advantage of the ECC exemption), but subsequently migrate it to dark fibre (subject to the cost of doing so).

Time related charges

Background

- 8.80 TRCs are levied for services such as fault repair and providing or rearranging services where the work is not covered within BT's terms of service.⁴⁸⁵ They are provided across different markets, including business connectivity and fixed access markets. They are generally charged on a per visit basis, i.e. the Standard Chargeable Visit rate, which includes travel and the first hour of the job, plus any additional hours, i.e. the Additional Hour charge, with the charges varying depending on when the work takes place (e.g. within or outside normal business hours).
- 8.81 TRCs revenue related to business connectivity markets was [X] in 2014/15; (of which [X] related to alternative interface symmetric broadband origination (AISBO)/multiple interface symmetric broadband origination (MISBO) and [X] related to TISBO). Total TRCs revenue amounted to [X], and so that the proportion accounted for by leased line services was around [X] (meaning the vast majority of TRCs relate to the fixed access markets).⁴⁸⁶ TRCs revenues accounted for a very small proportion of Ethernet and TI revenues in 2014/15 [X].⁴⁸⁷

June 2015 LLCC Consultation

- 8.82 For the June 2015 LLCC Consultation, we proposed a starting charge adjustment on Ethernet TRCs to bring them down to the charges set for WLR and LLU: a 28% reduction to hourly Ethernet TRCs and a 12.3% reduction to the visit charge. We also proposed that they should be indexed by +0.2% per year for the three years of the proposed control, which was consistent with our decision in the June 2014 FAMR Statement.⁴⁸⁸

Stakeholders' comments

- 8.83 BT considered that Ethernet TRCs have higher costs than FAMR TRCs and should not therefore be aligned with FAMR TRCs. BT considered there are two reasons why Ethernet TRCs have higher costs. Firstly, the average grade of engineer used for Ethernet TRCs is higher than FAMR TRCs. Secondly, there are larger overheads for Ethernet repair TRCs than FAMR TRCs. BT also explained that Ethernet TRCs

⁴⁸⁵ Openreach, *Price list, Time Related Charges (Including Shifts)*, <https://www.openreach.co.uk/orpg/home/products/pricing/loadProductPriceDetails.do?data=hcaYjIWe gP2u2KS8FTdcOBScuIM1Opem5f8dVePnh8UIMnGHsqdC0vzO163bJmh34D91D7M0q8u%2F%0All SqtIFAKw%3D%3D> (TRC Price List).

⁴⁸⁶ BT response to 8th s135 notice dated 16 January 2015, questions A1-A3

⁴⁸⁷ This percentage was calculated using the total revenues for business connectivity markets from the *Current Cost Financial Statements 2015* (p.25)

<http://www.btplc.com/Thegroup/RegulatoryandPublicaffairs/Financialstatements/2015/CurrentCostFinancialStatements31July2015.pdf>

⁴⁸⁸ Ofcom, *Fixed access market reviews: wholesale local access, wholesale fixed analogue exchange lines, ISDN2 and ISDN30 – Volume 2: LLU and WLR Charge Controls, Statement*, 26 June 2014, Volume I, Paragraph 1.52

<http://stakeholders.ofcom.org.uk/telecoms/ga-scheme/specific-conditions-entitlement/market-power/fixed-access-market-reviews-2014/statement/>

are more complex than FAMR TRCs, requiring the analyst team to typically spend [3<] assessing the TRC before the engineer or engineers are despatched.⁴⁸⁹

- 8.84 Vodafone welcomed our proposal of a starting charge adjustment on Ethernet TRCs to bring them into line with FAMR TRCs.

Our conclusions

Background

- 8.85 In the March 2013 BCMR Statement, we noted that Openreach applied the same prices regardless of whether TRCs were carried out for WLR, LLU or Ethernet services and they were also subject to a cost orientation obligation. We, therefore, decided that further regulation was disproportionate as pricing was already constrained. However, we did note that if Openreach were to discriminate between types of product user to distort competition, we would consider more direct intervention.⁴⁹⁰
- 8.86 We considered further our approach to regulating TRCs in the June 2014 FAMR Statement, and concluded that in light of the evidence available, BT was earning revenues in excess of costs for FAMR TRCs, leading to consumer harm. As a result we imposed a charge control on FAMR TRCs, whereby we introduced a one-off 28% reduction to hourly TRC charges and a 12.3% reduction to visit charges, in order to bring them into line with 2014/15 cost estimates. This involved a two-stage process:
- first, we sought to identify the appropriate reduction required to bring TRC charges more into line with costs. This was based on an analysis of TRC engineering rates, using Openreach management accounts and other information received from BT, uplifted by an estimate of overhead costs, which resulted in a 12.3% reduction to all TRC rates; and
 - second, we made an additional reduction to the hourly charge rate to take into account the fact engineers work fewer minutes than BT bills for due to the rounding in BT's billing approach (i.e. it bills in increments of one hour irrespective of the job duration). This was based on an analysis of a sample of TRC jobs, where we compared the actual job duration with the TRCs billed, in order to bring revenues into line with costs. This resulted in an additional reduction of 18% to all hourly charges, i.e. the hourly element of the Standard Chargeable Visit and the Additional Hour charges.
- 8.87 We then indexed these charges by +0.2% per year to reflect future cost changes based on wage inflation and an efficiency assumption.⁴⁹¹

⁴⁸⁹ BT response to the June 2015 LLCC consultation, paragraph 329

⁴⁹⁰ Ofcom, *Business Connectivity Market Review, Review of retail leased lines, wholesale symmetric broadband origination and wholesale trunk segments, Statement*, 28 March 2013, Paragraphs 20.81-20.83 <http://stakeholders.ofcom.org.uk/consultations/business-connectivity-mr/?a=0>

⁴⁹¹ Ofcom, *Fixed access market reviews: wholesale local access, wholesale fixed analogue exchange lines, ISDN2 and ISDN30 – Volume 2: LLU and WLR Charge Controls, Statement*, 26 June 2014, Volume I, Section 18
<http://stakeholders.ofcom.org.uk/telecoms/ga-scheme/specific-conditions-entitlement/market-power/fixed-access-market-reviews-2014/statement/>

- 8.88 While BT subsequently reduced the price of TRCs for WLR, LLU and GEA to comply with this charge control, it did not reduce prices for Ethernet TRCs. Given BT's historical approach of pricing TRCs at the same level irrespective of the wholesale service they were provided for, we have considered whether it is appropriate to apply similar adjustments to those made in the June 2014 FAMR Statement to Ethernet TRCs.

An adjustment to correct for rounding is not necessary

- 8.89 Since our June 2015 LLCC Consultation, we requested data from BT on the breakdown of TRCs by market and type. In direct contrast to FAMR TRCs, we found that the majority of Ethernet TRCs are for provisioning ([§<]) with a small percentage for repair ([§<]).⁴⁹² The difference in revenues is even more marked with the vast majority of Ethernet TRC revenue coming from provisioning [§<] and a small percentage from repair [§<].⁴⁹³
- 8.90 We also requested data from BT on the duration of Ethernet TRCs. BT provided us with one month's data for Ethernet provisioning TRCs.⁴⁹⁴ The data showed, amongst other things, the individual job number, the total time spent on site and the total TRC time recorded by the engineer for billing purposes. Ethernet provisioning TRCs take a significant amount of time to complete ([§<]), and on average multiple hours are charged against each individual TRC job ([§<]). Therefore, the majority of TRCs that are billed for are for multiple whole hours with only the last hour of the job potentially less than an hour. This is in contrast to FAMR TRCs where the vast majority of jobs were billed only for a single hour (which was included in the Standard Chargeable Visit charge). Therefore, we consider that it is unlikely that BT's billing approach (i.e. it bills in increments of one hour irrespective of the job duration) will result in a significant divergence between revenues and cost in relation to Ethernet TRCs.
- 8.91 BT only provided us with a very small sample of Ethernet repair TRC data that included job duration. However, as set out above, Ethernet repair TRCs are a small percentage of total Ethernet TRCs. Additionally, as explained in Section 8, Volume I, we consider that the vast majority [§<]% of Ethernet repair TRCs (i.e. right when tested and customer kit TRCs) fall outside the scope of the network access requirement and therefore should not be subject to any price controls.⁴⁹⁵ Therefore, although we have been unable to analyse the average length of Ethernet repair TRCs, we consider that overall, across both provisioning and repair TRCs, BT's hourly billing approach is unlikely to result in a significant over-recovery of costs in relation to Ethernet TRCs.
- 8.92 On this basis, we have decided not to apply an adjustment to correct for any rounding to Ethernet TRCs for this control.

BT uses a higher grade of engineer and incurs different overheads for Ethernet TRCs

- 8.93 BT has provided information which shows the grade and costs of engineers that it uses to undertake FAMR TRCs and Ethernet TRCs. The evidence shows that a higher grade of engineer is used to undertake Ethernet TRCs than FAMR TRCs.

⁴⁹² BT's response to the 26th s135 notice dated 17 November 2015, question A5

⁴⁹³ This information was provided by BT in response to the 11th s135.

⁴⁹⁴ BT's response to the 11th s135 notice dated 1 April 2014, questions A1 and A2

⁴⁹⁵ See Table 8.2, in Section 8, Volume I

This is consistent with our understanding that Ethernet TRCs are significantly more complex than FAMR TRCs.

- 8.94 BT provided a breakdown of the cost difference between the engineers it uses for FAMR TRCs and Ethernet TRCs. The data shows a significant difference in the pay ([<]%) and some difference in the non-pay costs ([<]%) between engineers that undertake FAMR TRCs and Ethernet TRCs.⁴⁹⁶ Having reviewed the information, as well as BT's explanation for some of the differences, we consider the percentage difference in pay to be credible. We also consider the percentage difference in non-pay costs, which is smaller, to be reasonable.
- 8.95 BT has also supplied a detailed breakdown of overheads for the engineers it uses for FAMR TRCs, although in response to our request for data BT said it was unable to provide detailed overheads for Ethernet TRCs. This was because Ethernet repair and provision TRCs are not reported separately in the regulatory reporting system. BT also stated that Ethernet TRCs use a different operating system to FAMR TRCs, which does not allow BT to extract the same granularity of data.
- 8.96 Given the lack of detailed overheads for Ethernet TRCs, we therefore have sought to calculate our own estimate. To do this, we have started with the FAMR TRC overheads and then applied adjustments (both uplifts and reductions) which we consider appropriate, in order to produce a reasonable proxy for Ethernet TRC overheads.⁴⁹⁷
- 8.97 Based on our analysis of pay, non-pay costs and Ethernet TRC overheads, we believe that Ethernet TRCs costs are broadly in line with their current charges. Therefore, we have decided not to apply a starting charge adjustment for this charge control period.

We have decided to apply a -0.15% index per year to Ethernet TRC charges

- 8.98 While we no longer consider a starting charge adjustment to be appropriate, we remain of the view that Ethernet TRCs should be subject to a charge control in this review period.
- 8.99 In the June 2015 LLCC Consultation we proposed that forecasting detailed TRC costs over the charge control was not proportionate, in line with our decision in the June 2014 FAMR Statement. We have decided that this continues to be the case. Therefore, instead, we have decided to subject the TRCs charges to a controlling percentage using a more straightforward method to calculate the index. Specifically, TRCs include labour and non-labour costs. We expect labour costs to increase over time in line with general wage inflation and non-labour costs to be potentially subject to an efficiency factor. Therefore, we have calculated the index by using a weighted average of the relative proportion of labour and non-labour costs to which we applied

⁴⁹⁶ BT's response to the 26th s135 notice dated 10 December 2015, question A7ab

⁴⁹⁷ Specifically, the process of calculating a reasonable proxy for Ethernet TRC overheads involved: i) uplifting pay related overheads on the basis of the percentage difference in salary between FAMR and Ethernet TRCs; ii) removing overheads we thought inappropriate or not relevant for Ethernet TRCs; iii) accepting those overheads we thought reasonable; and iv) deflating overheads attributed using pay plus return on assets to reflect the base year adjustment we have made to corporate overheads (AG112) which has the effect of reducing the amount of corporate overheads attributed to regulatory markets from 59% to 37% [see Annex 28].

our inflation estimate and efficiency factor respectively. This is the same approach as we used for FAMR TRCs.⁴⁹⁸

- 8.100 We note that approximately ([§<]) of our estimate of Ethernet TRC costs are labour based, while ([§<]) are not and so could be subject to an efficiency factor. In line with our assumptions for Ethernet services we have decided to apply 3% pay inflation⁴⁹⁹ and a 5% efficiency factor.⁵⁰⁰
- 8.101 This approach results in an index of -0.15% per year for the period of the charge control.

Dark Fibre

June 2015 LLCC Consultation

- 8.102 We proposed that the existing charging arrangements for (active) network extensions would provide the most suitable solution for the dark fibre service. Specifically, that for TRCs, the proposed controls applied to active services should also apply for the dark fibre service.⁵⁰¹

Stakeholders' comments

- 8.103 Stakeholders who responded to the June 2015 LLCC Consultation did not raise any specific questions or produce any evidence concerning whether active and passive TRC costs might differ.⁵⁰²

Our Conclusions

- 8.104 TRCs are, in effect, an hourly rate for engineering. As such, we would only expect there to be differences between BT's dark fibre and active TRCs to the extent there were differences in the underlying engineering costs e.g. the grade of technicians who undertake the work. Our understanding is that TRCs for dark fibre services are likely to relate to similar fibre activities to TRCs for Ethernet products. As such we consider there is unlikely to be a material difference between the costs incurred for dark fibre TRCs relative to active TRCs. Therefore, BT should set the same charges for regulated TRCs for dark fibre, as for active products.

⁴⁹⁸ To find a detailed rationale explaining why we chose to use this approach please see paragraphs 18.181-18.188 from Volume 1 of our June 2014 FAMR Statement

⁴⁹⁹ The pay inflation rate has come from our best view of pay inflation. See Annex 32 for an explanation of our best view of pay inflation.

⁵⁰⁰ Our efficiency factor is a proxy created by using our efficiency target for Ethernet opex. See Annex 29 for an explanation of our Ethernet efficiency rate.

⁵⁰¹ Ofcom, June 2015 LLCC Consultation, p.144-145

⁵⁰² For a more indepth review of potential cost differences between actives and passive products please review Annex 33.

Section 9

Implementation of the new charge controls and compliance

Introduction

- 9.1 The text of the SMP conditions that set out the new charge controls summarised in Volume I, Section 15 is contained in the statutory notification published at Annex 35 to this statement.
- 9.2 The purpose of this section is to explain how some of the key charge control decisions set out in Volume I, Section 15 are implemented in the SMP conditions in Annex 35. Our controls for Ethernet and TI baskets are set out in Volume II, Sections 5 and 6 and our controls for TRCs, ECCs and Accommodation services are set out in Volume II, Section 8. The legal tests that we have considered when implementing these decisions are set out below.
- 9.3 This section also outlines how we have decided to ensure compliance with the charge control.

Overview of the controls

- 9.4 We have imposed a series of restrictions on the BT's charges in the control period. First, for TI and Ethernet services we have imposed reductions in BT's charges on 1 May 2016 (i.e. starting charge adjustments). Second, for the period from 2 May 2016 to 31 March 2019, we will control BT's TI, Ethernet, TRCs, ECCs and Accommodation services through a series of price caps. Our starting charge adjustments and charge controls give BT the flexibility over how the reductions are implemented, rather than setting specific levels for each charge. However, we place some restrictions on BT's flexibility in implementing the starting charge changes and the charge controls through a series of sub-baskets and sub-caps. These various controls on BT's charges are implemented through formulae within the SMP conditions.

Baskets and services covered by the conditions

- 9.5 The structure of the SMP conditions broadly follows each of the baskets that we have imposed:
- SMP condition 10A covers Ethernet services at bandwidths up to and including 1Gbit/s falling within the wholesale markets for CISBO in the London Periphery and the Rest of UK excluding the Hull area in which we have found, in Volume I, Section 4, that BT has SMP (Ethernet Services Basket). The Ethernet Services Basket includes:
 - sub-basket controls for 1Gbit/s EAD and EADLA, Main Link and Interconnection;

- a combined rental and connection sub-basket for each EAD and EBD service;⁵⁰³ and
 - a sub-cap on all charges;
 - SMP condition 10D covers relevant products/services falling within the wholesale market for low bandwidth TISBO in the UK excluding the Hull Area, at bandwidths up to and including 8Mbit/s in which we have found, in Volume I, Section 5, that BT has SMP (TI basket).⁵⁰⁴ The TI basket includes:
 - a sub-basket on 2Mbit/s RBS, NetStream 16 Longline and SiteConnect; and
 - a sub-cap on Interconnection services; and
 - a separate sub-cap on all charges (excluding Interconnection services);
 - SMP condition 10E covers Accommodation services relating to all the relevant wholesale markets in which we have found that BT has SMP (Accommodation services basket).
 - SMP condition 10F covers relevant ECCs relating to Ethernet services, Very High CISBO Services, Dark Fibre Access and TI Services in the relevant wholesale markets in which we have found that BT has SMP:
 - we divide the products and services into Direct and Contractor ECCs to reflect the different controls imposed on each category;
 - we set out the nature of the basis of charges obligation that we are imposing on BT with respect to Contractor ECCs; and
 - we have also added a condition to continue to give effect to the May 2014 ECC Direction; and
 - SMP condition 10G covers relevant TRCs relating to Ethernet services, Very High CISBO Services and Dark Fibre Access in the relevant wholesale markets in which we have decided to find that BT has SMP.
- 9.6 The controls are summarised below, with the values for the caps as set out in Volume II, Sections 5-8.
- 9.7 Annex 35 lists the groups of specific products and/or services that are subject to each respective control. We have defined the specific services by reference to BT's price lists in the annexes to each of the SMP conditions. We have included a higher level description of services than in the March 2013 BCMR Statement. We consider this is sufficiently clear to identify the services within the charge control. BT

⁵⁰³ This Total Cost of Ownership (TCO) constraint excludes services where connections are withdrawn from new supply (e.g. BNS or ONBS) or that have very few connections (e.g. WES, WEES and BES).

⁵⁰⁴ Excluding ECCs and TRCs.

supported the higher level description and considered that it was sufficiently clear to identify the services within the charge control.⁵⁰⁵

The charge control formulae

- 9.8 The SMP conditions will have the following effects that relate to (i) the starting charge adjustments and (ii) the charge controls:
- i) **starting charge adjustments:** **First**, the conditions will set starting charge adjustments for 1 May 2016 for the services specified. This is done by means of the Controlling Starting Charge Percentage formulae. **Second**, the conditions will ensure that average charges for services subject to starting charge adjustments are no higher than required by the Controlling Starting Charge Percentages, as specified. This is done by means of the Percentage Starting Charge Change Formulae; and
 - ii) **charge controls:** **First**, the conditions will set charge controls from 2 May 2016 until 31 March 2019 for the services specified. This is done by means of the Controlling Percentage formulae. **Second**, the conditions will ensure that average charges for services subject to charge controls are no higher than required by the Controlling Percentages, as specified. This is done by means of the Percentage Change formulae. The percentage change for the First Relevant Year will be based on the price on 31 March 2016, and the price for the other years will be based on the weighted average Prior Year price.
- 9.9 We have used as a basis the formulae adopted in recent market reviews⁵⁰⁶ to ensure consistency. The SMP conditions and formulae are set out in full in Annex 35. Table 9.1 below outlines the specific parts of the conditions where the starting charge adjustment formulae relevant to each of the baskets and services are set out. Table 9.2 below outlines the specific parts of the conditions where the charge control formulae relevant to each of the baskets and services are set out.

Table 9.1: Starting charge adjustment formulae applied to baskets and services

	Controlling Starting Charge Percentage	Percentage Starting Charge Change
Ethernet basket	Condition 10A.2	Condition 10A.3
TI basket	Condition 10D.2	Condition 10D.3

Source: Ofcom, Annex 35

⁵⁰⁵ BT's non-confidential response to June 2015 LLCC Consultation, paragraph 386, p.75.

⁵⁰⁶ Ofcom, *Review of the fixed narrowband services markets: Statement on the proposed markets, market power determinations and remedies*, 26 September 2013, http://stakeholders.ofcom.org.uk/binaries/consultations/nmr-2013/statement/Final_Statement.pdf (September 2013 Narrowband Statement); June 2014 WBA Statement; and June 2014 FAMR Statement.

Table 9.2: Charge control formulae applied to baskets and services

	Controlling Percentage	Percentage Change
Ethernet basket	Condition 10A.8	Condition 10A.7
EAD 1Gbit/s Sub-basket	Condition 10A.8	Condition 10A.7
Main Link Sub-basket	Condition 10A.8	Condition 10A.7
Interconnect Sub-basket	Condition 10A.8	Condition 10A.7
Ethernet Rental Sub-basket	Condition 10A.12	Condition 10A.15
Ethernet Sub-cap	Condition 10A.13	Condition 10A.15
Exempt Ethernet Ancillary Services Safeguard Cap	Condition 10A.14	Condition 10A.15
Basket with Very High CISBO Safeguard Cap	Condition 10B.1	Condition 10B.2
TI basket	Condition 10D.8	Condition 10D.7
TI Mobile Services Sub-basket	Condition 10D.8	Condition 10D.7
TI Interconnection sub-cap	Condition 10D.12	Condition 10D.15
TI sub-cap (excluding Interconnection)	Condition 10D.13	Condition 10D.15
Exempt TI Ancillary Services Safeguard Cap	Condition 10D.14	Condition 10D.15
Accommodation services	Condition 10E.1	Condition 10E.2
Direct ECCs	Condition 10F.3	Condition 10F.2
TRCs	Condition 10G.4	Condition 10G.3

Source: Ofcom, Annex 35

- 9.10 For both the Starting Charge Percentage and Controlling Percentage formulae used in the first relevant year, we have used the CPI for the 12 months prior to 30 September 2015. As this will be six months prior to the start of the charge control, we consider that this should provide BT with sufficient time to implement price changes within the appropriate notification periods. This approach is consistent with the approach adopted in the March 2013 BCMR Statement.⁵⁰⁷ For all subsequent relevant years, we also have decided that the value of CPI for the 12 months prior to the 30 September immediately before the beginning of the relevant year should be used for the purposes of assessing compliance with the charge control.

Ensuring compliance

⁵⁰⁷ Paragraph 24.57, March 2013 BCMR Statement.

- 9.11 In this sub-section, we examine various issues in ensuring compliance with the charge controls including the timing of charge changes; basket weights; accrued revenue; notification periods for price reductions in the first month; our approach to discounts; carrying over provisions; and the exclusion of ancillary charges with annual revenue below £1m from both the Ethernet and TI baskets. Stakeholder comments in response to the June and November 2015 LLCC Consultations made in relation to our decisions on these issues are addressed elsewhere within Volume II of this Statement and therefore are not reproduced here.

BT is able to change charges at any time, but the formula takes into account the timing of those changes

- 9.12 We have designed the charge control formula so that it takes into account the timing of any changes BT makes. BT can change charges for services at any time during a particular year. However, the charge control formula explicitly takes into account *when* changes to charges occur. If BT were to introduce a charge reduction on the last day of a particular Relevant Year, it would be better off, in revenue terms, relative to making the same charge reduction on the first day of the formula year.⁵⁰⁸ However, our compliance formula adjusts for this. If BT were to delay a reduction, relative to making any charge adjustments on the anniversary of the control coming into force in each subsequent year, it would need to reduce charges by a larger amount later in the Relevant Year to achieve compliance with the basket control. Therefore, the compliance formulae outlined above and used within the SMP conditions take the timing of charge changes into account.⁵⁰⁹

We have used prior period revenues to weight price changes

- 9.13 The controls on BT's charges will limit the weighted average change in BT's charges to a maximum of CPI-X. Under the basket approach, it is necessary to calculate the weights apportioned to the services within the basket to assess BT's compliance with the controls. Regulators who have applied this form of control have generally used one of two main methods of calculating these weights – 'prior period revenue weights' or 'current period revenue weights'.
- 9.14 Under the prior period weighting approach, basket weights are set equal to the proportions of basket revenues accruing to the relevant services in the period prior to the one in which the price change occurs. Under the current period weighting

⁵⁰⁸ For example, assume that BT changes its charges for two services, say by 10%, on the first day of the Formula Year and keeps them at that level for the whole year. Other things being equal, then these charge reductions should result in its revenues declining by 10% (relative to the prior year). However, if BT delayed a reduction in the charges by six months and introduced the reduction in the second part of the year, then BT would be better off in revenue terms as it would have a six month period where charges were unchanged and only a six month period where charges were 10% lower. Other things being equal, this would result in BT's overall revenues being 5% lower relative to the prior year.

⁵⁰⁹ The formula calculates the percentage reduction for that service as a weighted average of the changes in charges (relative to the starting charge for the Formula Year). The weights applied would be based on the duration of the Formula Year a particular charge was applicable. For example, a charge that applied for half a year (182 days) would have a 50% weight (182/364). So, if the basket requirement were to decrease charges by, say, 10% and BT kept charges unchanged for six months, then it would need to decrease charges by 20% in the final part of the year to achieve the required reduction in charges for that Formula Year. In this instance, the calculated charge reduction would be: 50% x (0% price change) + 50% x (20% price change) = 10%.

approach, the weights are set equal to the proportion of current period basket revenues accounted for by each service as a proportion of total current period revenues.

- 9.15 During periods of stable volumes, these two approaches are broadly similar. However, where volumes, and volume mix in particular, are not stable, as in the case of leased lines, they can involve different advantages and disadvantages.
- 9.16 The current period approach can give rise to practical compliance difficulties for the regulated firm. Under this approach the firm needs to base its price changes for the current period on forecast volumes for that period, as the volumes are a key driver of the weights. Producing accurate forecasts can be difficult, giving rise to compliance risks and the need for mechanisms to address non-compliance, for example retrospective adjustment for errors in forecasting.
- 9.17 Another potential disadvantage with current period weights is that average revenue can be affected by a change in the product mix within the basket. For example, average revenue will fall if the quantity sold of a lower priced product within the basket increases relative to the quantity sold of a higher priced product, even if the prices of both products are unchanged. This is sometimes referred to as the 'apples and pears problem'.⁵¹⁰ In some markets, e.g. gas or electricity markets, in which average revenue controls have been used, output can be expressed in a convenient common unit, which avoids this problem, but this is much less likely to be true in telecoms markets.
- 9.18 Under the prior period approach, the weights to be used in the compliance assessment would be known in advance of setting regulated charges. This means that the regulated firm can set charges with a higher degree of certainty as to whether or not those charges will comply with the control. It is also potentially more transparent for stakeholders. Ofcom typically adopts the prior period approach largely as a result of these practical advantages.
- 9.19 However, although it is less practical, the current period approach can result in average changes in charges for the control year that more tightly control the firm's revenues than the prior period approach. In their response to our 2015 June LLCC Consultation, GTC argued that, where prior weights are used, BT has an incentive to maximise revenues by cutting the prices of services with declining volumes.⁵¹¹ GTC proposed that Ofcom should take into account this upward bias when setting the charge control by determining a higher X factor than would be the case if a current weighted index was used.
- 9.20 We have not amended our values of X as GTC proposed. We are not aware of evidence that BT has systematically tried to game compliance by cutting prices only on declining volumes.⁵¹² In practice, BT will likely consider a number of factors when deciding how it can maximise profitability while complying with the control, including encouraging upgrades to higher bandwidth circuits, encouraging migration from legacy circuits and the degree of competition.

⁵¹⁰ So called because if apples and pears are sold at different prices, compliance with a control on the average revenue from fruit will be affected by changes in the relative quantities of apples and pears sold.

⁵¹¹ GTC's non-confidential response to June 2015 LLCC Consultation, p.13.

⁵¹² In addition, we have not observed this trend for Ethernet services in the previous control period.

- 9.21 Additionally, adjusting the values of X for this purpose would be a significantly complex and time-consuming task involving the forecasting of detailed fluctuations of demand and prices within the control period, which is likely to involve a large margin for error.
- 9.22 Given the practical issues involved in using current period weights, we have decided to use the prior period weighting approach. However, over the course of the charge control period, customers are predicted to continue migrating from legacy to new services. The use of prior period weights in the model could therefore mean that legacy services are given a higher weight, in terms of compliance, than if we used current-period weights. Although prior period weights do not cause problems if each charge is reduced by the same amount, they can raise issues if BT wishes to reduce some charges by less than others. For example, if BT wishes to make all price reductions on EAD services and none on legacy Ethernet services to encourage migration, prior period weights would mean that the price reduction required would be greater than if in-period weights were used.
- 9.23 In its response to June 2015 LLCC Consultation, BT preferred September prior year volumes to be used rather than December.⁵¹³ BT considered that using September volumes would align better with the RFS, would represent the mid-point of each year of the charge control and would avoid BT having to re-run the Core Transmission Costing System (CTCS) in January for the sole purpose of getting the circuit volumes, which would consume additional resource and put at risk notification of price changes for 1 April.
- 9.24 For us, the most important consideration is that TI volumes are generally declining. Unlike Ethernet there is less transition between services within the TI basket, where all services are in decline, than between services within the Ethernet basket, where some legacy services are in decline whereas others are growing in volumes. When considering this alongside BT's compliance and practical points we consider that September volumes are an appropriate basis for TI services. We note that our decision is consistent with the approach we adopted in the March 2013 BCMR Statement.⁵¹⁴
- 9.25 We believe using September (TI) and December (Ethernet) volume weights strikes an appropriate balance in terms of reducing the time lag for prior period weights, ensuring that BT knows what price changes it needs to make in order to comply with the control prior to the beginning of each charge control year and ensuring compliance reporting is not disproportionate.
- 9.26 Therefore, for each year of the control, compliance for Ethernet will be based on volumes at 31 December in the case of rentals or the 12 months up to 31 December in the case of non-rental products in the year prior to the start of the control (e.g. 31 December 2015 for the control year starting 1 May 2016).⁵¹⁵ These volumes will be multiplied by the average price during the following periods:

⁵¹³ BT's non-confidential response to June 2015 LLCC Consultation, paragraph 486.

⁵¹⁴ Paragraphs 18.154-18.157, March 2013 BCMR Statement.

⁵¹⁵ For starting charge changes on 1 May 2016, we have decided that the weights also be based on volumes at 31 December 2015 in the case of rentals or the 12 months up to 31 December 2015 in the case of non-rental products. Therefore the same weights will apply across the first year of the charge control.

- for the first year of the control: the 12 months between 1st April 2015 and 31st March 2016;
- for the second year of the control: the 11 months between 1st May 2016 and 31st March 2017; and
- for the third year of the control, the 12 months between 1st April 2017 and 31st March 2018.

9.27 For compliance in the TI basket, compliance will be based on volumes at 30 September in the case of rentals or the 12 months up to 31 December in the case of non-rental products in the year prior to the start of the control (e.g. 30 September 2015 for the control year starting 1 May 2016).⁵¹⁶ These volumes will be multiplied by the average price during the following periods:

- For the first year of the control: the 12 months between 1st April 2015 and 31st March 2016;
- For the second year of the control: the 11 months between 1st May 2016 and 31st March 2017; and
- For the third year of the control, the 12 months between 1st April 2017 and 31st March 2018.

Accrued revenue

9.28 We have decided that BT must 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 with the charge control as described in more detail within the 'General Provisions and interpretation' section of each of the SMP conditions. As set out in Annex 27, Charge Control compliance will be based on 'Accrued Revenue' rather than 'Prior year Revenue' published in the RFS. Because of timing differences between 'Accrued revenue' and 'Prior year Revenue' it will not be possible for BT to reconcile the compliance information to the RFS.

9.29 BT will provide us with a schedule 'Accrued revenue reconciliation' that for each service over £1m provides monthly time series of revenue covering both the 'Prior year revenue' and the 'accrued revenue' period in order to demonstrate to us that the 'Accrued revenue' is derived from the same source as the RFS Prior year revenue. BT must also show any adjustments it makes to either 'Accrued revenue' or 'Prior year revenue' to arrive at the annual totals and must provide adequate explanations as to the nature of the adjustment. The 'Accrued revenue' totals must reconcile to the totals within the compliance schedule and 'Prior year revenue' should reconcile to the RFS. While BT will be expected to publish a non-confidential version of the compliance schedule, it will not be required to publish a version of the 'accrued revenue reconciliation'.

⁵¹⁶ For starting charge changes on 1 May 2016, we have decided that the weights also be based on volumes at 31 December 2015 in the case of rentals or the 12 months up to 31 December 2015 in the case of non-rental products. Therefore the same weights will apply across the first year of the charge control.

Notification periods for price reductions in the first month

- 9.30 In SMP Condition 6, we have imposed requirements on BT relating to the notification period for changes to charges, specifically 28 days' notice for new services, 28 days' notice for price reductions and 90 days' notice for all other changes (including price increases).
- 9.31 For the avoidance of doubt, the SCAs require BT to make price reductions on the first day of the charge control, and therefore BT will not be required to give 28 days' notice under Condition 6.4(b) of the SMP conditions. This is because SMP Condition 6.3 applies where the change is directed or determined by Ofcom.
- 9.32 In addition, we have decided to waive the requirement on BT to give 28 days' notice of price reductions for the first month of the charge control period. This will allow BT to reduce the prices in the first month to comply with the glide-path requirements. The 90 day period required for price increases remains unchanged as other requirements set out in Condition 6.
- 9.33 We do not consider that granting consent to the waiver of this requirement for a one month period at the start of the charge control will have a significant impact on a market for any of the services, facilities, apparatus or directories in relation to which we have functions under Chapter I of the Act.⁵¹⁷ We have therefore decided not to carry out a domestic consultation. We consider that:
- granting consent would be objectively justifiable as we anticipate the price reductions would be of direct benefit to BT's customers and would encourage downstream competition;
 - the notice period requirement provides transparency to CPs that reductions are applied in a non-discriminatory and a consistent timing basis. There is a risk that waiving this notice period requirement could result in less transparency. However, we note that the EOI and no-undue discrimination obligations which we have imposed ensure that BT does not unfairly favour to a material extent an activity carried on by it so as to place at a competitive disadvantage persons competing with it. We also note that we have limited any potential for this reduced transparency by restricting the period that the notification requirement would not apply to one month;
 - granting consent in this case would be proportionate in order to ensure that the price reductions are passed on to customers at the earliest appropriate opportunity;
 - consent would also be transparent, in that it is clear that the intention is to ensure that these price reductions are passed on at the earliest appropriate opportunity; and
 - finally, we also consider that granting of this waiver would be consistent with our obligations under sections 3, 4 and 4A of the Act, in that it would further the interests of consumers and encourage downstream competition by enabling BT to introduce price reductions at the earliest possible stage and therefore result in benefits to customers.

⁵¹⁷ As set out in section 49A(1)(b) of the Act.

- 9.34 We also consider that granting consent is not of EU significance as it would very unlikely affect trade between Member States. We have not therefore included the consent in this draft statement and will issue it in our final statement following the EU consultation.

Discounts

- 9.35 As discussed in Annex 34, we have decided that for the purposes of meeting BT's charge control obligations:
- volume discounts will not count towards compliance;
 - geographic discounts will not count towards compliance;
 - time-limited discounts will count towards compliance. However, the CPI-CPI sub-cap on each and every charge will not apply to increases in charges as a result of time-limited discounts being removed; i.e. compliance with the sub-cap is based on the pre-discounted prices;
 - three year and five year term products (subject to our TCO constraint) will count towards compliance. No other forms of term product will count towards compliance; and
 - discounts will not be included in our starting charges.

BT is allowed to carry over differences in the average charge for a basket to the next charge control year

- 9.36 For the charge control baskets, we have allowed BT to carry over any price reductions it makes in excess of the requirements of the charge control for that year. That is, if BT's average charge for these baskets at the end of the Relevant Year is lower than required by the associated CPI-X constraint, it is able to carry over the difference into the next charge control year. This means that the benchmark for assessing BT's compliance with the control in the following year is the level of charges BT was required to achieve, rather than the level it actually achieved.
- 9.37 Conversely, if BT's average charge is higher than the required level, it would have to take the excess into account in the following year. This mechanism addresses the impact of fluctuations in the factors included in the charge control formula resulting in a difference between forecast and actual compliance with the control. We have allowed for carry-overs for each and every basket, including sub-baskets, as set out in the conditions.⁵¹⁸
- 9.38 The use of a mechanism to correct for prices higher than those assumed by the charge control formula does not imply that BT is permitted to set prices which are above those assumed by the charge control. In this regard, we note that the SMP conditions would require BT to repay the affected CPs any excess revenue it earns should its average charge be higher than the required level in a particular year. However,

⁵¹⁸ In its non-confidential response to the June 2015 LLCC Consultation, BT sought clarification that carry overs were allowed in each basket where price reductions are larger than expected (paragraphs 340-342).

- 9.39 In its response to the June 2015 LLCC Consultation, BT argued that it would not be reasonably possible and/or practicable for BT to repay the affected CPs any excess revenue BT earns. BT argued that it would be impossible to determine which CPs have been subject to excess charges, and that where Excess occurs, the costs of identifying which CPs to repay and processing these payments would likely far exceed the small amounts of Excess. BT added that draft SMP condition 5A.9 already provides a suitable approach for corrective actions in the case of Excess.⁵¹⁹
- 9.40 We disagree with BT that that it would not be reasonably possible and/or practicable for BT to repay the affected CPs any excess revenue. We note that BT has flexibility to set prices within the constraints set out in this statement, and therefore we do not consider Condition 10A.10 as impractical, since BT will be able to identify a set of prices that would have complied. We rejected similar arguments raised by BT in FAMR and WBA. Furthermore, we do not consider that 10A.9 provides sufficient protection as, while it corrects the price path for the subsequent year, it does not address any overcharging that has taken place in the current year. We have therefore decided to require BT to repay any excess, as proposed in our June Consultation.

Ancillary charges with annual revenue below £1m are excluded from both the Ethernet and TI baskets but a safeguard cap will apply

- 9.41 In the June 2015 LLCC Consultation, we decided that it would not be appropriate to impose separate sub-baskets on Ethernet and TI Ancillary Services (charges related to the provision of core Ethernet and TI services, excluding ECCs, TRCs and Accommodation), as we did not have any reason to have greater concerns about these charges compared to others in the basket. We did, however, include them within our sub-cap on other charges within their respective baskets.
- 9.42 In response to the June 2015 LLCC Consultation, BT submitted that we should not require them to include ancillary charges such as upgrade, migration, cancellation shift or service features charges in the calculation of accrued revenues. BT argued that these charges “*constitute a very small fraction of Openreach revenues, and add disproportionate complexity and burden to Openreach’s compliance while not generating any benefits to customers*”.⁵²⁰ It suggested that the proposed safeguard cap would be sufficient.
- 9.43 We have assessed the impact of excluding these ancillary charges from the baskets. We found that, in the case of both Ethernet and TI, due to the very small proportion of the basket revenue that is made up by these charges; excluding them from the basket has very little impact on the size of the overall basket and therefore the size of the reductions that we are requiring BT to make over the control period. Additionally, given the significant number of separate ancillary charges, we recognise that including these charges in their respective baskets does add complexity to monitoring and compliance. We also note that these ancillary charges were not included in our forecasting model.
- 9.44 However, as we noted in our June 2015 LLCC Consultation, leaving these charges without any safeguard is unlikely to act as an effective control.

⁵¹⁹ BT main response to the June 2015 LLCC Consultation, paragraphs 342-348

⁵²⁰ BT’s non-confidential response to June 2015 LLCC Consultation, paragraph 146, p.33.

- 9.45 We have decided to exclude any ancillary charges with annual revenue below £1m from both the Ethernet and TI Baskets.⁵²¹ These charges will be subject to a safeguard cap, set at the level of CPI-CPI. We consider that this provides sufficient protection to BT's customers while minimising the complexity of compliance for BT.

We include provisions concerning 'material changes' to charge controlled services

- 9.46 As part of our charge control conditions, we have included general provisions related to material changes that could impact on the effectiveness of the charge control. We would give regulatory effect to such changes by giving a direction under these conditions, following any consultation under the relevant procedures under the Act.
- 9.47 These provisions, which are included in each of the SMP conditions, cover any material changes, other than to a charge, including to:
- a material change to any product or service, which can include the introduction of a new product or service wholly or substantially in substitution for that existing product or service;
 - the date on which BT's financial year ends; and
 - the basis of the Consumer Price Index (where appropriate).

Flexibility to deal with changes in the services offered by BT

- 9.48 As discussed above, we have decided to set controls by reference to a particular set of products currently offered by BT. However, BT may wish to amend or remove services, or to bring in a replacement service within the duration of the charge controls. We have explained our approach to services falling within the scope of the control, including to defining the specific services by reference to BT's price lists. Those lists only include BT's services that we expect to exist when the charge control commences.
- 9.49 Telecoms markets are subject to ongoing product development and innovation. We therefore anticipate that BT could develop a product or service that wholly or substantially replaces the product or service referred to in the annexes to each SMP condition. To reflect that consideration, we have included a provision in the SMP conditions that ensures in its effect that, if BT were to introduce a single new service that wholly or substantially replaces an existing service using, for example, a new, more efficient technology, the single replacement service would fall within the scope of the charge control. For example, a single new service that falls within the scope of the relevant Ethernet or TI basket caps should remain subject to that same overall basket cap for the duration of the charge control period, irrespective of the underlying technology that BT uses to provide that service.
- 9.50 To clarify, the prior year weight associated with the replaced product is transferred to the new product when that new product wholly or substantially replaces an existing product. Completely new products should not be covered by the charge control and if

⁵²¹ Based on prior year weights.

a product is withdrawn with no replacement then the prior year weight should be set to zero.⁵²²

- 9.51 Furthermore, subject to Ofcom's prior agreement (such agreement to be given in writing or by way of direction as Ofcom considers appropriate), where BT introduces multiple services that replace a previous existing service, the new services will remain subject to the same overall basket (and, where relevant, sub-basket) control for the duration of the charge control period. In such a circumstance, either the TCO constraint (for EAD and EBD services) or the CPI-CPI sub-cap (for any other services) will apply to each individual service. The reasoning for the inclusion of this decision is set out in Volume II, Section 5.

Legal tests

- 9.52 We consider that each of the price controls on wholesale leased lines services would satisfy the legal tests set out in the Act and would be in accordance with our legal duties.
- 9.53 We explained in Volume I, why we considered that, in principle, our decision to impose price controls (including both the charge controls and the safeguard cap) would satisfy the relevant legal tests. However, we consider this in more detail below in light of the specific decisions set out in this Volume II.
- 9.54 In particular, we set out below why we consider that:
- each of the price controls would be authorised pursuant to section 87(9) of the Act, and would satisfy the tests in section 88 of the Act and the criteria in section 47(2) of the Act;
 - in formulating each of the price controls, we have complied with our relevant statutory duties, particularly those under sections 3 and 4 of the Act; and
 - in formulating each of the price controls, we have taken utmost account of the EC Leased Lines Pricing Recommendation and BEREC Common Position.

Legal tests relating to all of the price controls excluding the very high CISBO safeguard cap

- 9.55 Section 87(1) of the Act provides that, where Ofcom has made a determination that a person (in this case BT) has SMP in an identified services market (in this case three CISBO and TISBO wholesale markets⁵²³), Ofcom shall set such SMP conditions authorised by that section as Ofcom considers appropriate to apply to that dominant provider in respect of the relevant network or relevant facilities and apply those conditions to that person.

⁵²² This is in response to a request for clarification in BT's non-confidential response to June 2015 LLCC Consultation, paragraphs 388-90, p.76.

⁵²³ In Volume I, Sections 4 and 5, we identify the following markets where BT has SMP: 1) the wholesale market for CISBO services in the London Periphery (LP); 2) the wholesale market for CISBO services in the RoUK excluding Hull; and 3) the wholesale market for low bandwidth TISBO services (up to and including 8Mbit/s) in the UK excluding the Hull area

- 9.56 Section 87(9) of the Act authorises the setting of SMP conditions to impose on the dominant provider:
- such price controls as Ofcom may direct in relation to matters connected with the provision of network access to the relevant network, or with the availability of the relevant facilities;
 - such rules as Ofcom may make in relation to those matters about the recovery of costs and cost orientation;
 - such rules as they may make for those purposes about the use of cost accounting systems; and
 - obligations to adjust prices in accordance with such directions given by Ofcom as they may consider appropriate.
- 9.57 Section 88 of the Act states that Ofcom should not set an SMP condition falling within section 87(9) except where it appears from the market analysis that there is a relevant risk of adverse effects arising from price distortion and it also appears that the setting of the condition is appropriate for the purposes of:
- promoting efficiency;
 - promoting sustainable competition; and
 - conferring the greatest possible benefits on the end-users of the public electronic communications services.
- 9.58 In setting price controls, section 88 also requires that we must take account of the extent of the investment in the matters to which the condition relates of the person to whom the condition is to apply.
- 9.59 For the purpose of explaining why we consider the legal tests to be met, we have set out our position on all of the price controls for wholesale leased lines services (excluding the very high CISBO safeguard cap⁵²⁴) together below. We have also identified, where appropriate, certain specific points that we consider to be particularly relevant to individual aspects of the proposed price controls, or to the price control for particular services.
- 9.60 We discuss the legal tests for our decisions in relation to BT's Regulatory Financial Reporting in Volume I, Section 16.

We have considered the tests under sections 87 and 88 of the Act

- 9.61 We consider that the SMP Conditions satisfy the tests set out in section 88 of the Act. Our reasoning is set out in detail in the relevant parts of this statement relating to the different price controls, in particular Volume II, Sections 5 and 6 in relation to the controls for Ethernet and TI services, and Volume II, Section 8 in relation to the controls for Accommodation, Excess Construction Charges and Time Related Charges. Therefore the specific points set out below should be read in conjunction with the more detailed analysis in those sections.

⁵²⁴ This is considered in Volume I, Section 8 and is covered by SMP Condition 10B.

- 9.62 As set out in Volume I, Sections 4 and 5 we consider that, in the absence of appropriate *ex ante* regulation, there is a relevant risk of adverse effects arising from BT fixing and maintaining some or all of its prices for the specific services we have decided to include in the price controls in the relevant CISBO and TISBO wholesale markets at an excessively high level.

Promoting efficiency

- 9.63 We consider that each of the price controls is appropriate for the purpose of promoting efficiency.
- 9.64 As explained in Volume II, Section 4, in setting the price controls (in the form of a glide path with a CPI-X) BT is encouraged to achieve greater productive efficiency in providing wholesale services. This is achieved by allowing BT to keep any super-normal profits that it earns within the defined period by reducing its costs over and above the efficiency gains we have assumed in setting the charge control.
- 9.65 We also consider that our price controls promote efficiency because, amongst other things:
- by ensuring BT cannot price excessively and by bringing charges more into line with forecast costs, each of the price controls would increase allocative efficiency;⁵²⁵
 - each of the price controls would allow BT to earn a reasonable rate of return (the cost of capital) if it is efficient;
 - we provide BT with the flexibility to change its prices to meet the necessary demand conditions by recovering common costs in the most efficient manner across the groups of services (subject to any relevant sub-caps); and
 - by setting broad Ethernet and TI baskets, we encourage efficient migration from the legacy services within these baskets.

Promoting sustainable competition and conferring the greatest possible benefits on end-users

- 9.66 We also consider that each of the price controls are appropriate to promote sustainable competition and to confer the greatest possible benefits on end-users of public electronic communications services.
- 9.67 In particular, each of the price controls would prevent excessive pricing and, by applying at the wholesale level, would promote sustainable retail competition which we consider is likely to confer the greatest benefits on end-users of public electronic communications services. We have identified the appropriate services to be subject to price controls. The price controls aim to bring BT's charges for these services in line with BT's costs of provision by the end of the control period, and also enable other operators to compete using these services on this basis. Competition will ensure benefits for end-users in terms of choice, price, quality of service and value for money.

⁵²⁵ When prices better reflect the underlying costs of production, allocative efficiency is enhanced. Meeting demand at cost-reflective prices will result in resources being allocated to the goods or services that consumers value most.

- 9.68 Further, the efficiency savings that we refer to in the sub-section above, should, in the longer term, be passed onto consumers through reductions in prices, either as a result of competition or through subsequent price controls.
- 9.69 Some of our price controls apply to baskets, therefore we have decided to implement appropriate safeguards to ensure that BT does not use the pricing flexibility offered to it in a way that would harm competition (see Volume II, Sections 5-6).

Investment

- 9.70 When deciding the price controls we have also taken into account the need to ensure BT has the incentives to invest and innovate where it is efficient to do so.
- 9.71 In particular, amongst other things:
- in modelling BT's costs for the price controls on wholesale leased lines services and in considering how these will change over time, we have included BT's efficiently incurred costs and built in a reasonable return on investment (see Volume II, Sections 5, 6 and 8);
 - we have decided to use forms of price controls (based on incentive regulation rather than rate of return regulation) which encourage and reward productive efficiency (see Volume II, Section 3);
 - we have decided to adopt the anchor pricing approach for the TI basket controls and the MEA approach for the Ethernet basket controls, which allows BT the ability to recover its costs and provides incentives to invest in innovative and more efficient NGA technology (see Volume II, Sections 5 and 6);
 - we have decided to base our cost forecasts on BT's costs of providing wholesale leased lines services rather than those of another operator, which encourages investment by other operators where it is efficient, i.e. when other operators are able to operate at the same or lower cost than BT (see Volume II, Section 5); and
 - we have considered the level of investment within our starting charge adjustment analysis and have based our model on incentive regulation, which creates better incentives for investment and efficiency by the regulated firm than regulation which seeks to strictly align prices with costs at all points in time. We consider that investment decisions are based on a longer-term view of expected prices, such as those in the final year of the charge control. We have set our charge control at a level which we consider promotes efficient investment, and replicates the outcome of a competitive market (see Volume II, Section 7).
- 9.72 We consider that each of the price controls strikes a good balance between ensuring BT's charge are not excessive and ensuring appropriate incentives for investment and innovation.

We have considered the tests under section 47 of the Act

- 9.73 Any SMP condition must also satisfy the tests set out in section 47 of the Act, namely that it must be:
- objectively justifiable in relation to the networks, services or facilities to which it relates;

- not such as to discriminate unduly against particular persons or a particular description of persons;
- proportionate as to what it is intended to achieve; and
- in relation to what it is intended to achieve, transparent.

9.74 We consider these tests are satisfied for the price controls. We set out below some of the specific reasons for considering that each of the tests in section 47 is satisfied. However, this should be read in conjunction with our more detailed analysis set out (in particular) in Volume II, Sections 5-8.

The SMP condition is objectively justifiable

9.75 As set out above, in the absence of any price control, BT could set excessive charges that would have an adverse impact on both the ability of companies to compete in the downstream provision of services and on consumer choice and value for money. Our price controls have been designed to address this risk while allowing BT the ability to recover its costs, including a reasonable return on investment. Additionally, we have reviewed each service within the markets so that we have introduced an appropriate level of control for individual services where appropriate.

9.76 As a result of our analysis set out in this document we consider the SMP condition is objectively justifiable.

The SMP condition does not discriminate unduly

9.77 We are satisfied that each of the price controls does not discriminate unduly against particular persons or a particular person, because any CP (including BT itself) is able to access the services at the charge levels set by the price controls.

9.78 We consider that the price controls do not discriminate unduly against BT as the controls seek to address BT's market position, including its incentive and ability to set excessive charges for services falling within the scope of the price controls.

The SMP condition is proportionate

9.79 We are satisfied that the price controls are proportionate because they would apply to an appropriate set of charges within those markets where we have identified BT as having SMP. The price controls are focused on ensuring that there are reasonable prices for those access services, which are important to competitive downstream markets.

9.80 The price controls allow for BT to make a reasonable return on investment and provide BT with the incentives to invest and develop its network. Moreover, the maximum charges that BT are allowed to set over the period of the charge controls have been formulated using information on BT's costs and a consideration of how these costs will change over time.

9.81 We therefore consider that each of the price controls for wholesale leased lines services are proportionate in that they do not, in our view, impose controls on the prices that BT charge that go beyond what is required to achieve the aim of addressing BT's ability and incentive to charge excessive prices for these services.

The SMP condition is transparent

- 9.82 We consider that each of the price control SMP conditions is transparent in relation to what it is intended to achieve. The aims and effect of each of the price controls are set out in this statement. The text of the SMP conditions has been published with this statement. We have also set out the likely impact of the price controls on charges for the duration of the control.

We have considered sections 3 and 4 of the Act

- 9.83 We consider that each of the price controls are consistent with our duties under sections 3 and 4 of the Act for the reasons set out in this section, and in this statement as a whole.
- 9.84 We consider that each of the price controls will, in particular, further the interests of citizens and of consumers in relevant markets by the promotion of competition in line with section 3 of the Act.⁵²⁶ In particular, each of the price controls seeks to ensure the availability of electronic communications services, priced at an appropriate level, throughout the UK. In determining each of these price controls, we have had regard to the desirability of promoting competition in relevant markets, the desirability of encouraging investment and innovation in relevant markets and the desirability of encouraging the availability and use of high speed data transfer services throughout the UK.
- 9.85 We have taken into account further objectives, including ensuring that services are available at charges that are reasonably related to the efficient costs of supply (preferably as a result of effective competition) and investment and innovation (namely, the objective of promoting efficient investment in the development of new and innovative services by BT and other CPs).
- 9.86 In line with section 4 of the Act, we consider that each of the price controls will, in particular, promote competition in relation to the provision of electronic communications networks and will encourage the provision of network access for the purpose of securing efficiency and sustainable competition in downstream markets for electronic communications networks and services, resulting in the maximum benefit for retail consumers.
- 9.87 Finally, in performing our duty to further the interests of consumers, we have also had regard in the price controls, in particular, to the interests of those consumers in respect of choice, price, quality of service and value for money.

We have taken into account the EC Leased Lines Pricing Recommendation

- 9.88 The Leased Lines Pricing Recommendation relates to pricing aspects of wholesale leased lines part circuits and includes recommended EC Price Ceilings for leased line part circuits to *"inform and guide a national regulatory authority ("NRA") as to how to apply the best current practices in leased lines provision when devising regulatory remedies for leased line markets that are not effectively competitive in their territory"*.⁵²⁷

⁵²⁶ While our market analysis has shown the relevant wholesale TISBO market is declining, we consider it appropriate and desirable to continue to further the interests of citizens in relation to communication matters and the interests of consumers in the downstream retail markets by promoting competition in the relevant wholesale TISBO market.

⁵²⁷ Explanatory Memorandum to the Leased Lines Pricing Recommendation, page 6.

- 9.89 We have taken utmost account of the Leased Lines Pricing Recommendation when developing our price controls. The EC Price Ceilings are based on prices for leased lines part circuits from Member States in June 2004. Since then, however, both prices and costs have changed.
- 9.90 Therefore, we consider that the RFS data (as adjusted by Ofcom) is more relevant in setting prices for the next charge control period and that, given the changes in market conditions, the use of the EC Price Ceilings could result in prices that diverge from the efficient cost of provision. By using up-to-date cost accounting data from BT's RFS and other relevant inputs and assumptions, we consider that we have ensured that prices are at an efficient level.

We have taken into account the BEREC Common Position

- 9.91 In formulating our price controls discussed above, we have also taken utmost account of the BEREC Common Position including BP30, BP31 and BP32 which appear to us to be particularly relevant in this context.⁵²⁸ We consider that our decisions are consistent with the best practice set out in the BEREC Common Position.

⁵²⁸ BEREC Common Position on best practice in remedies imposed as a consequence of a position of significant market power in the relevant markets for wholesale leased lines, BoR (12) 126.