Wholesale Local Access Market Review – Volume 2

Consultation on proposed charge control designs and implementation

Redacted [✂] for publication

Consultation

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Contents

Section 1

Introduction

Scope

1.1 In this consultation we set out our proposals for the Wholesale Local Access (WLA) market as part of our WLA market review.

1.2 Volume 1 sets out our market analysis, approach to remedies, detailed proposals for the access products BT will be required to provide and our approach to price regulation of these services, including proposals to set charge controls for Local Loop Unbundling (LLU) and Virtual Unbundled Local Access (VULA) services.

1.3 This volume, Volume 2, sets out our proposed approach, derivation, level and implementation of the proposed LLU and VULA charge controls.

1.4 In this section we set out:

- a summary of our proposals;
- the strategic context of our proposals; and
- a description of the contents of the sections in this volume of the document.

Summary of proposals

1.5 For each of the services subject to a charge control we set out a central estimate and a range for the proposed prices. In our final decision, in our Statement to be published in early 2018, we will set out a single value for each price.

1.6 Our approach to setting the control for Metallic Pathway Facility (MPF) is broadly to have stable prices compared to today, with underlying costs estimated on a similar basis to that used in previous market reviews. These prices reflect our analysis that shows the underlying costs of LLU are falling, offset by a substantial increase in business rates.

1.7 Generic Ethernet Access (GEA) services are not currently subject to a charge control. Our analysis suggests these prices are significantly higher than cost and therefore a cost based charge control will significantly reduce wholesale prices for GEA.

1.8 Our key proposals are that:

- the standard annual rental charge for MPF[1] changes from £85.29 in 2016/17 to £81.98 in 2020/21;
- the annual rental charge for GEA 40/10[2] reduces from £88.80 in 2016/17 to £52.77 in 2020/21;

[1] Service Maintenance Level 1 – price applicable January to March 2017.
[2] Up to 40 Mbit/s downstream and up to 10 Mbit/s upstream.

- the new charge controls for LLU and GEA services will commence on 1 April 2018 and cover the period to 31 March 2021 (the Market Review Period); and

- prices in 2019/20 and 2020/21 will be at cost based levels. Prices for 2018/19 will be set using a glidepath which has the effect of setting prices 2/3rd of the way along the glidepath between the 2016/17 prices and 2019/20 prices.

1.9 The new charge controls that we propose for BT's copper and fibre services are set out in Tables 1.1 and 1.2. below. A detailed description of each service and basket is provided in Section 3. The base case is presented below; full ranges based on low and high cost cases are presented with the base case in Section 4.

Table 1.1: Proposed LLU charge controls (base case)

Basket/service	Charges at 31 March 2017 (£)	Form of control	Charge control for 2018/2019	Charge control for 2019/20	Charge control for 2020/21
MPF Rental (annual)	85.29	CPI-X(3)	£83.50	CPI-3.5%	CPI-2.4%
MPF Single Migration	30.26	CPI-X	£23.89	CPI-13.6%	CPI-5.2%
MPF Bulk Migration	20.97	CPI-X	£14.92	CPI-18.1%	CPI-4.7%
MPF New Provides basket	various	CPI-X	CPI-27.5%	CPI-15.9%	CPI-5.3%
MPF Soft Cease	Zero	n/a	Zero	Zero	Zero
SMPF Soft Cease	Zero	n/a	Zero	Zero	Zero
Hard Ceases basket	various	CPI-X	CPI-27.6%	CPI-15.9%	CPI-4.7%
SFI[4]	various	CPI-X	various	CPI-8.7%	CPI-1.4%
TRCs[5]	various	CPI-X	various	CPI-8.7%	CPI-1.4%
Other MPF ancillaries basket	various	CPI-X	CPI-55.9%	CPI-34.2%	CPI-6.0%
LLU tie cables basket	various	CPI-X	CPI-2.0%	CPI-2.2%	CPI-3.6%
LLU Co-mingling New Provides and Rentals services basket	various	CPI-X	CPI+54.6%	CPI+22.9%	CPI-5.3%

Source: Output from the control module.

[3] Consumer Price Index minus X (CPI-X).
[4] Special Faults Investigation (SFI).
[5] Time-Related Charges (TRCs).

Table 1.2: Proposed VULA charge controls (base case)

Basket/service	Charges at 31 March 2017 (£)	Form of control	Charge control for 2018/2019	Charge control for 2019/20	Charge control for 2020/21
GEA (FTTC[6]) 40/10 Rental (annual)	88.80	CPI-X	£66.28	CPI-16.1%	CPI-9.4%
FVA[7] with GEA (FTTP) 40/10 Rental (monthly)	16.04	Aligned with GEA (FTTC) 40/10 Rental + MPF Rental			
GEA (FTTP) 40/10 Transition	7.40	Aligned with GEA (FTTC) 40/10 Rental			
PCP[8] Only Install	49.00	CPI-X	£43.47	CPI-8.3%	CPI+1.3%
Start of Stopped line	32.52	CPI-X	£6.47	CPI-57.9%	CPI+1.1%
FVA with GEA (FTTP) 40/10 Connection	117	£117	£117	£117	£117
GEA (FTTP[9]) 40/10 Transition Connection	92	£92	£92	£92	£92
CP[10] to CP Migrations	11.00	CPI-X	£4.50	CPI-38.5%	CPI+1.1%
GEA (FTTC and FTTP) ceases	5.37	n/a	Zero	Zero	Zero
1 Gbit/s Cablelink	2,000	£2,000	£2,000	£2,000	£2,000
10 Gbit/s Cablelink	10,000	£10,000	£10,000	£10,000	£10,000
VLAN[11] Moves	15	£15	£15	£15	£15
GEA Bandwidth modify – to 40/10	11.25	CPI-X	£8.02	CPI-18.0%	CPI-2.8%
GEA Cancel/Amend/Modify	various	Aligned with MPF equivalents			
Superfast Visit Assure	130	£130	£130	£130	£130
Fibre Broadband Boost	159	£159	£159	£159	£159

Source: Output from the control module.

[6] Fibre To The Cabinet (FTTC).
[7] Fibre Voice Access (FVA).
[8] Primary Cross Connection Point (PCP).
[9] Fibre To The Premises (FTTP).
[10] Communications Provider, also known as telecoms provider.
[11] Virtual Local Area Network (VLAN).

Strategic context

VULA charge controls

1.10 In the 2014 FAMR Statement we did not impose a charge control on VULA prices in general, on the basis that if we did set prices the risk of deterring future investment and of failing to take adequate account of BT's Next Generation Access (NGA) network investment, was greater than the risk of reduced benefits to customers that may result from unconstrained VULA prices.

1.11 BT retained flexibility over the level of VULA prices during the duration of the current charge control which expires on 31 March 2017, with the following exceptions:

- we set a cost-based charge control of £11 for a migration of a GEA customer from one telecoms provider to another; and
- we required BT to maintain a minimum margin between VULA and BT's retail service using VULA, the specifics of which were the subject of a separate consultation and statement in 2015.[12]

Strategic Review of Digital Communications

1.12 In February 2016, we published our Initial Conclusions to the Strategic Review of Digital Communications, setting out a ten year vision for ensuring the quality and availability of communications services in the UK.[13] This envisaged the UK becoming a world leader in the availability and capability of its digital networks, with widespread competing networks delivering choice, innovation and affordable prices to homes and businesses. We set out in Section 2 how we take account of the objectives and principles set out in this strategic review.

1.13 In our July 2016 Progress Update: supporting investment in ultrafast broadband networks[14], we noted that the 2017 WLA Consultation would put forward our approach to regulated access and pricing of Openreach's superfast and ultrafast services, which is an important factor in the decision whether to invest in building competing ultrafast networks or to rent services from Openreach.[15]

Provisional SMP conclusions and proposed charge control remedies

1.14 In Section 3 of Volume 1 we set out our provisional conclusions that BT has SMP in, among others, the WLA market in the UK excluding the Hull Area. Sections 8 and 9

[12] More information about the VULA margin has been published on Ofcom's website: https://www.ofcom.org.uk/consultations-and-statements/category-3/vula-margin-guidance-supplementary.
[13] The Initial Conclusions to the Strategic Review of Digistal Communications has been published on Ofcom's website: https://www.ofcom.org.uk/phones-telecoms-and-internet/information-for-industry/policy/digital-comms-review/conclusions-strategic-review-digital-Communications.
[14] The July 2016 Progress Update: supporting investment in ultrafast broadband networks has been published on Ofcom's website: https://www.ofcom.org.uk/phones-telecoms-and-internet/information-for-industry/policy/digital-comms-review/duct-and-pole-access.
[15] Ofcom, 2016. *Progress update: supporting investment in ultrafast broadband networks.* https://www.ofcom.org.uk/__data/assets/pdf_file/0031/68791/july_2016_progress_update.pdf.

of Volume 1 set out in detail our proposals for price regulation of VULA and LLU and where charge controls are required.

1.15 This volume sets out our proposed approach to setting these new charge controls, their form, level and duration.

Structure of this Volume

1.16 The remainder of this volume is set out in the following structure:

- Section 2 – the economic and regulatory background to the setting of cost-based charges for LLU and VULA;
- Section 3 – charge control design, including basket structure;
- Section 4 – charge control cost modelling for the LLU and VULA charge controls;
- Section 5 – the levels of our proposed LLU and VULA charge controls, the implementation of the proposed charge controls and our assessment of the proposals against the applicable legal tests.

Disclosure of financial and volume forecast models

1.17 We have disclosed the following models alongside this consultation by publishing:

- a version of the top-down (MPF) cost model which includes non-confidential input data and formulae;
- a version of the volume forecast model which includes non-confidential input data and formulae;
- a version of the bottom-up cost model which includes non-confidential input data and formulae; and
- a version of the base year model which includes non-confidential input data and formulae.

1.18 These models, in non-confidential versions, are available here: https://www.ofcom.org.uk/__data/assets/file/0032/99644/Published-Consultation-Models.zip. Note that as a consequence of the redactions, the final outputs from the models are not consistent with the results shown in Volume 2 and the Annexes.

1.19 In developing our proposals on model disclosure, we have had regard to our obligations under the Communications Act 2003 (the "Act") and our Framework for Disclosure of Charge Control Models.[16]

[16] Ofcom. *Framework for disclosure of charge control models* http://stakeholders.ofcom.org.uk/binaries/consultations/784024/Charge_control.pdf.

Section 2

Economic principles for setting cost-based charges for LLU and VULA

Summary of our proposed principles

2.1 In this section, we explain our general approach to setting the charge controls for LLU and VULA services and outline our proposals on the following:

- **Form of controls**: we propose to impose charge controls, indexed by inflation, designed to align charges to forecast efficient costs.
- **Cost standard and allocations of common costs for MPF and GEA services**: we propose to forecast total aggregate Wholesale Local Access (WLA) and Wholesale Fixed Analogue Exchange Line (WFAEL)[17] costs based on current cost accounting for fully allocated costs (CCA FAC). We forecast LLU costs and GEA costs on the basis of long run incremental costs plus an allocation of common costs (LRIC+). We allocate common costs between LLU rentals and GEA rentals on an equi-proportionate mark-up (EPMU) basis. We then propose to allocate costs between services with different speeds of SFBB based on the current observed difference in prices: the so-called 'bandwidth gradient'.
- **Network model choice**: we propose to set charges based on the efficient on-going costs of providing MPF services over an ongoing copper network and GEA services over a fibre to the cabinet (FTTC) network.
- **Duration of the LLU and VULA charge controls:** we propose to set the charge control for a three-year period from 1 April 2018.
- **Speed of aligning charges with costs:** we propose to set a path of charges that aligns them to the costs of MPF and GEA services by 1 April 2019, one year after the start of the control.[18]

Approach to imposing the WLA charge controls

2.2 Our overall objective when setting charge controls, as prescribed by the Act, is to set such conditions as appear appropriate to us for the purpose of promoting efficiency, promoting sustainable competition and conferring the greatest possible benefit on the end-users of public electronic communication services.[19]

2.3 In Volume 1 (Sections 8 and 9), we set out our approach to price regulation in the WLA market that addresses the competition concerns resulting from BT's SMP in WLA and that fits with our overall strategy. A key focus of our strategy when charge controlling services in the WLA market is to give BT and its competitors incentives to invest in new networks while balancing the need to promote competition to the

[17] Although we are not setting a charge on services within the WFAEL market (i.e. WLR) these services have common assets with WLA services. We have therefore included WLR services in our charge control modelling in order to be able to determine appropriate common cost allocations.
[18] As discussed in Section 3, we also propose to charge control SMPF soft and hard ceases.
[19] Section 88 Communications Act 2003.

benefit of consumers. In particular, we want to incentivise operators to build new networks rather than rely on buying access from Openreach. In determining how to implement the pricing remedies identified in Volume 1 services we have outlined our objectives below.

2.4 As we set out in Volume 1, in developing our approach to pricing remedies we are seeking to promote competition by reference to four key objectives:

- **Preserving the investment incentives faced by competitors to BT,** incentivising BT's competitors to build their own networks where viable.
- **Preserving the investment incentives faced by BT,** by applying the 'fair bet' principle. This recognises that the investing firm needs to benefit from sufficient upside potential from any investment to offset the downside risk of failure.
- **Protecting customers against the risk of high prices**. Interventions to encourage investment in new infrastructure must take account of the risk that they could result in higher prices for consumers. However, the risk of short term price rises may be outweighed by the harm caused by a lack of investment altogether.
- **Protecting retail competition where necessary, based on access to BT's network.** Where we do not expect network competition to emerge and during the transitional period before it emerges, the prices charged for access to BT's network must allow rivals to compete.

2.5 Based on these considerations, as set out in Volume 1, we propose to impose charge control remedies on MPF services[20] and GEA services offered at 40/10 download/upload bandwidth, with pricing flexibility for other bandwidth variants of GEA.[21]

Form of the controls

We propose to apply indexed charge controls

2.6 We propose to apply inflation indexed charge controls for the MPF and GEA services in question, in which the price cap is annually updated for inflation minus an adjustment, we refer to this approach as CPI-X. [22] This form of control has a number of desirable properties, as discussed below, such that we consider it is the form of control that would be most consistent with our duties. A particular feature of this form of control is that it gives BT incentives to enhance its efficiency and make efficient investments. This is an important consideration for us and something we must consider under section 88 of the Act.

2.7 Cost based price cap regulation (rather than 'rate of return' regulation) 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. Price cap regulation

[20] We are also proposing to charge control some SMPF ancillary services (i.e. SMPF soft and hard ceases). See Section 3 for details.
[21] As discussed in Section 3, we are proposing to charge control some ancillary services that are provided with all GEA variants.
[22] The Consumer Price Index is our preferred measured of inflation for setting inflation minus/plus 'X' charge controls (see 2014 FAMR Statement section 3.110 onwards).

provides incentives to 'outperform' the control and improve efficiency over time. When the charge control is reset, customers can benefit in the longer term from these additional efficiency gains through lower prices.

2.8 Price cap regulation can also provide incentives for efficient investment. The level of the charge control is set to allow BT the expectation of earning a reasonable rate of return equivalent to its cost of capital if it is efficient. We have used this form of price cap regulation over multiple review periods which provides a consistent approach that encourages such investment.

2.9 We therefore believe that a price cap approach promotes efficient investment by both BT and other telecoms providers, and benefits consumers by encouraging cost savings which feed through to lower future prices. It is appropriate to continue using an indexed price cap approach. We propose to use a price cap approach to implement the WLA charge controls.

Cost standards and allocations of common costs for MPF and GEA services

Promoting efficiency and sustainable competition

2.10 When setting charge controls we aim to promote efficient investment by both BT and competitors to BT whilst allowing BT the opportunity to recover efficiently incurred costs. To this end, there are different aspects to economic efficiency that we will need to consider: allocative efficiency, productive efficiency (which are collectively referred to as static efficiency) and dynamic efficiency.

Allocative efficiency

2.11 Allocative efficiency involves allocating resources to produce the goods and services that consumers value the most. To achieve this charges should reflect the additional resources used to provide a service, that is, its incremental costs. If charges are set at the forward looking incremental cost, then purchasers who value the service at least as much as its incremental cost have the opportunity to purchase it.

2.12 Setting charges at incremental cost may then be consistent with achieving allocative efficiency. However, for a multiproduct firm with economies of scope, pricing all services at incremental cost would not be sustainable because the firm would not be able to recover its common costs. When common costs need to be recovered through charges, some (though not necessarily all) service prices need to be marked up above incremental cost. Including a mark-up will lead to some inefficiency and a pricing rule, such as Ramsey pricing[23], can be used to minimise this inefficiency. However, using a Ramsey pricing approach has practical difficulties due to the amount of information on the elasticity of demand that is required. Regulators therefore tend to use other methods to set prices in practice, for example by allocating common costs on the basis of FAC or LRIC+ (discussed further below).

Productive efficiency

2.13 When wholesale inputs are substitutes in the provision of a given downstream service the main function of relative prices is to signal to users which wholesale service they should use in order to minimise costs (for productive efficiency).

[23] Ramsey pricing allocates common costs on the basis of relative inverse demand elasticity (a measure of how responsive demand is to price).

Productive efficiency then points towards setting the price differential of substitute services so as to ensure that telecoms providers have an incentive to choose the wholesale service that minimises the total costs of providing downstream voice and broadband services. This points us towards setting the price differential of substitute service as LRIC and allocating common costs accordingly. We take this productive efficiency into account when determining the common costs allocation between MPF rentals and WLR rentals as discussed below.

Dynamic efficiency

2.14 Dynamic efficiency refers to the improvements in efficiency that occur over time as innovation, technological advances and new investments result in existing services having lower resource costs and in new goods and services being developed. Dynamic efficiency is promoted by a consistent and stable regulatory framework over time, which is more likely to be favourable to investment by both BT and other telecoms providers.

Balancing these aspects of economic efficiency

2.15 We consider these different forms of efficiency when developing our proposals for implementing the charge control. We propose to calculate costs in a way that allows the recovery of the incremental cost plus an allocation of common costs on a forward looking basis. By allowing the recovery of both incremental and common costs we do lose some allocative efficiency, but we preserve BT's incentives to invest. We also set prices that are at a level more likely to encourage other telecoms providers to invest, which is beneficial for dynamic efficiency. In considering the costs that BT is able to recover, we have also given weight to allowing the fair bet to be realised, as discussed later in this section.

2.16 When considering how we allocate common costs to maximise efficiency, we are really interested in creating a structure of prices that maximises efficiency. The allocation rules that we outline below are mechanisms to ensure that the costs we use to determine lead us to set efficient prices in the charge control.

2.17 Our two frequently used approaches for estimating forward looking costs in this way are to calculate the CCA FAC or the LRIC+. The FAC of a service is calculated as the sum of direct costs (costs that can be directly attributed to the service) and common or indirect costs that are allocated to the service based on specified accounting principles.[24] The LRIC+ of a service is calculated as the forward looking incremental cost of a service and includes an allocation of common cost (the '+'). We usually perform the common cost allocation on the basis of the relative LRICs of different services (i.e. the higher the relative LRIC the greater the allocation of common costs). We refer to this allocation as an EPMU allocation.

2.18 We noted in the 2012 LLU WLR Charge Control Statement that there may be little to differentiate between CCA FAC and LRIC+.[25] Both cost standards involve using accounting rules and assumptions for the recovery of common costs for different products. They both reflect forward looking costs rather than the actual prices at the

[24] There are a number of different approaches that can be taken to allocate these indirect costs (e.g. profit weighted NRC or total pay costs.)
[25] Ofcom, 2012. Charge control review for LLU and WLR services – Statement, Section 3, https://www.ofcom.org.uk/__data/assets/pdf_file/0024/53808/statementmarch12.pdf.

time the relevant assets were purchased, giving a better signal for efficient investment and entry than historic costs or prices.

2.19 In past LLU charge controls we have generally preferred to use CCA FAC. We believed it was a more transparent approach to establishing service costs. BT reports its CCA FAC for each regulated service as part of its Regulatory Financial Statements (RFS), meaning these costs are externally audited. In contrast, if we wished to use LRIC estimates, we have previously been largely reliant on BT's estimates of LRIC produced by its own LRIC model. We have been cautious when using output from this model because it is unaudited and not well understood by our stakeholders. A further drawback of BT's LRIC model is that it would not provide us with the level of common costs that we would wish to allocate across services.

2.20 As discussed in Section 4 and Annexes 12 and 13, for this review we have built our own bottom-up model that can calculate the LRIC of GEA-FTTC services. We therefore have the option for calculating LRIC independently of BT's LRIC model. However, to allocate common costs to SFBB services we are reliant on BT's CCA FAC data.

Proposal to use CCA FAC across the WLA Market

2.21 We propose to continue to use CCA FAC as the basis for forecasting the efficient total aggregate cost across the WLA market.[26] CCA FAC has been used to set LLU prices across a number of control periods and has been considered previously in the Competition Commission's Final Determination in the LLU and WLR Appeals.[27] It can also be reconciled to BT's RFS, which are published by BT and independently audited. BT CCA FAC data still provides us with the best source of cost data across all services across the market, which is important when we wish to allocate common costs.

2.22 While we consider CCA FAC to be relevant as a measure of cost in total, we do not necessarily consider this to be the appropriate standard for capping individual charges in all cases or for determining relative charges. For some services it may be appropriate to set prices at LRIC without a mark-up because in those circumstances the efficiency or competition advantages of LRIC outweigh the practical benefits of FAC. In other situations, it may be appropriate to set a control on the average price for a basket of a number of services on the basis of FAC, but to allow freedom for the prices of individual services within the basket to be above or below FAC. We discuss the cost standard and charge control structure that we use for each individual service in Section 3.

Proposal to use LRIC+ as the cost standard for MPF and GEA services

2.23 Although we are using CCA FAC to estimate aggregate costs across the total market, we are proposing to estimate the costs for MPF and GEA services on a LRIC+ basis. As discussed above, we are able to calculate the LRIC of SFBB services provided over an FTTC network from our bottom-up model. We are also able to obtain LRIC estimates for copper services from BT's LRIC model. By using a CCA FAC approach for the total market, we can have more confidence that we are

[26] By this we mean the total costs across the portfolio of services sold by BT within the WLA market, rather than the costs to be recovered from individual services.
[27] Competition Commission, 27 March 2013. *Final Determinations on cases 1193/3/3/12 and 1192/3/3/12.* https://assets.publishing.service.gov.uk/media/5332def6e5274a5660000001/Final_determinations__PDF__2.6_Mb_.pdf [accessed 14 March 2017].

not missing, or double counting costs and that costs are relatively transparent and audited.

2.24 We believe the appropriate mark-up, the '+' in LRIC+ should be set on an EPMU basis when allocating costs between service groups (i.e. between copper services and fibre services). We discuss this in more detail below, and set out our specific proposals for how we allocate common costs between different copper services and between different fibre services.

Recovery of common costs between MPF and GEA services[28]

2.25 An EPMU approach allocates costs common to MPF and GEA services in proportion to their respective service LRICs, resulting in a LRIC+ estimate for both sets of services. EPMU is a well-established approach to distributing common costs between services and is commonly used by Ofcom and other regulators in pricing determinations.[29] Although conceptually there may be other approaches that are better for promoting static efficiency, we are not able to implement these other approaches, such as Ramsey pricing, accurately and we believe an EPMU is an acceptable, practical alternative. We therefore propose to use EPMU to allocate common costs between copper and SFBB services.

2.26 We have considered whether, as part of our analysis under section 88 of the Act, any impact on infrastructure competition may mean it is more appropriate to allocate a larger share of common costs to copper or SFBB services in order to promote sustainable competition. At the extreme, all common costs could be allocated either solely to copper or solely to fibre.

2.27 We estimate that, in comparison to EPMU, allocating all common costs to fibre in 2020/21 would decrease the MPF price by around 35%, while increasing the GEA charge by around 85% with the net impact on MPF+GEA an increase of around 15%. In contrast, allocating all common costs to copper in 2020/21 would increase the MPF price by around 15% relative to EPMU. The GEA charge would decrease by around 35% with the net impact on MPF+GEA of a decrease of around 5%.

Table 2.1: Impact of alternative cost allocations

	Approximate impact in 2020/21 vs EPMU approach if 100% of common costs allocated to:	
	MPF	GEA
MPF impact	Increase: 15%	Decrease: 35%
GEA impact	Decrease: 35%	Increase: 85%
MPF+GEA impact	Decrease: 5%	Increase: 15%

Source: Ofcom analysis.

2.28 We would expect the impacts to be different in years other than 2020/21 because the weights of the respective GEA and MPF services would be different. Over time, as SFBB penetration increases, we would expect the net impact on MPF+GEA to

[28] We discuss our detailed proposals for how we allocate common costs between services in Annex 11. As discussed in this annex, we are not proposing to reallocate any common costs currently allocated to other markets into the WLA and WFAEL markets.

[29] For instance, EPMU was used to allocate some common costs when calculating LRIC+ estimates of the cost of mobile call termination. See A6.13 of the 2011 MCT Statement. https://www.ofcom.org.uk/__data/assets/pdf_file/0026/53981/mct_statement_annex_6-10.pdf.

decrease. We do not believe that allowing prices to fluctuate due to this transitory impact would promote competitive investment in the long term.

2.29 Allocating significantly more common costs to copper products, and away from SFBB products, could disincentivise new network build and impair the promotion of sustainable competition. This is because wholesale costs of buying inputs to SFBB (e.g. MPF+GEA) would decrease, as the common costs would be spread across a greater number of copper lines. This would push down retail prices of SFBB, decreasing the profitability of an alternative full fibre network that relies upon demand for higher bandwidth services.

2.30 In contrast, allocating more common costs to fibre might incentivise build. A significant increase in the retail SFBB prices could decrease static efficiency, which could mean slower migration to SFBB. We do not think this would be counterbalanced by an increase in take-up of SBB to any material extent. This is because the penetration of broadband is already very high – with almost 80% of adults with fixed broadband access[30] – and of those without broadband most are likely to be insensitive to price decreases. Among UK adults without internet access at home, half did not think they needed it, and 42% either did not want to own a computer or felt they were too old to use the internet.[31] This contrasts with evidence from BT (discussed in Volume 1 Section 3) which shows almost half of people are thinking of upgrading to SFBB, and may be put off by significant price increases. Very low SBB prices could therefore make it harder to attract customers to full fibre services and therefore hamper the promotion of sustainable competition.

2.31 Therefore, it is not clear that deviations from EPMU would significantly promote further investment. Significant differences in the amount of common costs allocated to MPF and GEA could also distort competition as different telecoms providers sell quite different proportions of SBB and SFBB. Increasing common cost allocations to fibre could also have negative consequences for static efficiency.

2.32 On balance, we consider it appropriate to continue to propose an allocation of costs common to MPF and GEA services based on an EPMU approach.

Recovery of common costs between copper services

2.33 We use the EPMU approach described above to allocate common costs between MPF and GEA services. Although we are not proposing to charge control WLR and SMPF[32] services, we will still need to decide on an approach to allocate common costs to these services in order to determine the level of common costs to allocate to MPF.

2.34 In the 2014 FAMR Statement, we recognised that MPF and WLR+SMPF are close wholesale substitutes into the same downstream retail services (i.e. voice and/or broadband). We considered that where wholesale services are close substitutes, price differentials should be equal to incremental cost differences so that purchasers are given incentives to use the service which minimises total costs. This means that we should allocate common costs so that the same absolute amount of common cost is recovered per line. We therefore set the price differential between (i) MPF and

[30] Ofcom, 2016. The Communications Market 2016: Internet and online content https://www.ofcom.org.uk/__data/assets/pdf_file/0023/26393/uk_internet.pdf.
[31] The Communications Market 2016: Internet and online content, figure 5.16.
[32] As discussed in Section 3, we are proposing to charge control the SMPF Hard Cease service.

WLR and (ii) between MPF and WLR+SMPF equal to the absolute difference in their incremental costs to maximise productive efficiency.

2.35 We are still of the view that MPF and WLR+SMPF are close substitute wholesale services. We therefore propose to continue allocating the common costs per (copper) line as in the 2014 FAMR Statement, with the same absolute amount of common cost allocated per line irrespective of whether the service is MPF or WLR.

Recovery of common costs between GEA rental services

2.36 Above we propose to use a LRIC+ cost standard for regulating GEA services. In this section, we consider what proportion of the common fibre cost to attribute to BT's 40/10 GEA rental service and what proportion of common costs to allocate to other GEA rental services.[33]

2.37 The network resources used to provide different GEA variants is near identical meaning the LRIC for these different services will be very similar. If we used an EPMU approach to allocate costs to these services, then different bandwidths would have near identical charges.

2.38 It is unlikely that pricing different bandwidths of GEA at the same level (i.e, using an EPMU approach) would promote allocative efficiency because it is unlikely that the elasticities of demand for the different GEA services at the retail level will be similar. In this case, we consider that we can produce a more efficient allocation of costs by relying on the current pricing structure of GEA services. None of BT's GEA rental services are currently subject to a charge control meaning we may expect that the pricing differential we observe between different services represents BT's view of the pricing structure that maximises its profit. We can infer from BT's pricing decisions what an efficient allocation of costs would be.

2.39 Current FTTC charge differentials are likely explained by differences in the retail customer's willingness to pay, rather than LRIC differentials, across the different speeds. We propose to spread the total cost allocated to FTTC rentals in line with the existing ratio of BT's charges for different speeds. The current price relativities are shown in Table 2.2 below.[34] This means that if BT were to maintain the existing ratio of prices relative to our control on FTTC 40/10, on the basis of our current volume forecasts, it would just break-even. We believe this is the best available approximation to how BT may actually price its higher speed services.

Table 2.2: Current price relativities of different GEA services

	18/2	40/2	40/10	55/10	80/20
Price relative to 40/10	54%	93%	100%	114%	134%

Source: Openreach's FTTC price list.[35]

[33] In addition to a 40/10 GEA service, Openreach also currently also offers services at 40/2, 55/10 and 80/20.
[34] We note that on 28 March 2017 Openreach published special offer prices for GEA-FTTC based on achievement of volume commitments and the relativities of the different GEA services special offer prices differs from the relativities of the standard prices. However, we regard the relativities of the standard prices to be a more relevant indication of efficient price relativities.
[35] Openreach. Fibre To The Cabinet – Price List: https://www.openreach.co.uk/orpg/home/products/pricing/loadProductPriceDetails.do?data=0RIviN9g

2.40 In principle, this could mean that some services would be priced below the LRIC output of our bottom-up model. However, we do not believe this should be a concern. The bottom-up model produces a LRIC estimate for the entire GEA-FTTC increment. If we were able to produce LRIC estimates for individual GEA-FTTC bandwidth services (i.e. the intra-GEA incremental cost by bandwidth), as most of the costs of GEA are common across all of the bandwidth services, we would expect these incremental costs to be considerably lower than the average LRIC for the entire GEA-FTTC increment. We would then have a significant amount of common costs that we would need to allocate to different bandwidth GEA services.

2.41 Rather than trying to identify the LRICs of the individual GEA-FTTC services and then reallocate the common costs, we believe it is appropriate for the purposes of this proposed charge control to base the cost difference between bandwidths on the observed prices. In Annex 11 we describe in more detail how we propose to implement this approach.

2.42 We also considered an alternative consisting of fixing current rental charge differences to the 40/10 service in absolute value. Given the data available (rental volumes and current charges, per speed), our estimates using charge differences in absolute value generate a lower charge control level for 40/10 than our estimates using the charge ratios. However, in practice, that difference in the 40/10 rental estimates is relatively small.[36] In our view, using the ratios (rather than the absolute differences) to determine the charge control level for the anchor offers the advantage of protecting BT from a risk of under-recovery of costs.[37]

2.43 As investment decisions being made now are affected by expectations of demand, competition and regulation long into the future, an important part of our approach is to provide, to the extent we can, a level of certainty about the future regulatory framework.

2.44 As we set out in Volume 1, where the prospect of network competition is likely to provide a sufficient constraint, we may not extend the scope of our charge controls beyond retaining cost-based charge controls on LLU and 40/10 VULA services. As higher bandwidth services become more important, the business case for competitive ultrafast investment is likely to strengthen, and with that the prospect of greater competition delivering innovation, quality and choice as well as lower prices for consumers.

2.45 If we were to continue with a similar approach to the allocation of common cost between GEA services in the future to that we propose for this review i.e. use observed prices and projected volumes to allocate common costs between GEA services, we would risk having the effect of including higher bandwidth services in our charge control, as any higher prices for higher bandwidth services would cause a lower allocation of costs to the charge controlled 40/10 service. Such an approach

WGKtCdDGaQ8IFObCjmFDJOVDZEidKC%2F1wh1Z6rNZujnCs99NbIKJZPD9hXYmiijxH6wrCQm97GZMyQ%3D%3D accessed 1 March 2017.

[36] We estimate that the difference for the 40/10 GEA service would be £0.27 per month in 2020/21.

[37] If we set the charge control for 40/10 using our estimates based on current absolute charge differences while in reality charges follow the current ratios, then BT would under-recover the costs allocated to fibre. The risk of under-recovery only in 2020/21 would be of c. £49.3m. However, if we set the charge control for 40/10 based on current ratios while in reality charges follow the current absolute differences, then BT would over-recover the costs allocated to fibre. The risk of over-recovery only in 2020/21 would be of c. £45.3m.

would also risk being gamed both by BT and access seekers as we would partly rely on their projected volumes in order to allocate common costs.

2.46 We cannot prejudge what actions we will take in the future, as any pricing decisions in future reviews will be made in the light of the circumstances and legal framework applicable at that time. However, in the interests of regulatory certainty and consistency, we think it is useful to set out our initial thinking on this issue, and in particular, how this might apply to the design of a charge control for VULA.

2.47 Our initial thinking is that in a future review it would be most appropriate to update the existing control for efficiency and scale effects relevant to fibre sales overall, but not to adjust the spot control to reflect future growth in margins and/or volumes of higher bandwidth products other than to reflect scale effects of demand across all VULA bandwidth services. Thus, under such an approach, we would not expect to reallocate cost away from the 40/10 service to take account of any increase in the relative price of the 80/20 service and/or any increase in the proportion of higher bandwidth services. Instead, barring a significant change in anticipated circumstances, under this approach we would expect to maintain the existing ratios of prices and existing bandwidth volumes used in the statement to this consultation.

2.48 We are proposing to take this approach, first, because any further updates to the spot control would be highly "gameable". It could, for example, give BT an incentive to change the price of its products prior to the statement or prior to the next review in order to affect the charge control. Other telecoms providers could manipulate sales volumes for similar reasons. Any observed relative prices are also likely to provide less insight into competitive prices in future reviews, as with only the 40/10 service subject to a charge control, any price differentials between 40/10 and other bandwidth services would not reflect a commercial outcome. Secondly, were we to include in future charge controls the effect of an increase in future ratios of prices or volume weightings of different bandwidth services it could have the effect of reducing the incentives for competitors to invest in their own networks, as doing so could result in any increased profits on higher bandwidth services being clawed back through lower prices for 40/10 in future reviews.

2.49 We therefore propose to set the GEA 40/10 regulated price in this charge control period to maintain the current bandwidth gradient based on Openreach's standard prices, and note our initial thinking that in future review it would not be appropriate to update the pricing gradient or volume forecasts for higher bandwidths.

Network model choice

2.50 We have a general preference for setting charges using the costs and asset values derived from the most efficient available technology that performs the same function as the current technology. This is often described as the modern equivalent asset (MEA) approach to pricing.[38]

2.51 When we are experiencing gradual technological change, we can capture its impact via the MEA approach. If a more radical technological change is occurring, using an MEA approach may present significant challenges. During a period of technological

[38] For a more detailed explanation of our approach to MEA pricing and when we consider it appropriate to move away from the MEA approach see Ofcom, *Leased Lines Charge Control. Proposals for a new charge control framework for certain leased lines services - Consultation*, 5 July 2012, paragraph 4.54, www.stakeholders.ofcom.org.uk/binaries/consultations/llcc-2012/summary/LLCC_2012.pdf.

change, we apply the principle that consumers of existing services are not made worse off by the adoption of new technology. We may therefore prefer to use an 'anchor pricing' approach.

2.52 The anchor pricing approach anchors the price (and quality) of existing services to the legacy technology, even if the services are provided over a new technology. This approach gives 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.

2.53 It could be argued that we should model the cost of voice and broadband services on the basis of an FTTP network. If an infrastructure operator deployed a network today, we would expect them to deploy an FTTP network. However, we would have some concerns with using an FTTP network as the basis for setting charges.

2.54 We believe that there would be considerable scope for error in using FTTP to determine the cost of services delivered over the existing copper/FTTC network. There is no scale national FTTP operator in the UK and we would therefore not have a real-world network on which to base our cost estimates. Additionally, we would need to reduce (or 'abate') the cost of the FTTP services to take account of the fact they were providing lower functionality[39] (either in the form of copper or SFBB services). We therefore believe that the proven technologies[40] provide a better basis on which to base our charge controls.

Network choice for modelling the cost of LLU services

2.55 We have used the anchor pricing approach to set a number of charge controls in the past, including the last three controls on LLU charges. In the 2014 FAMR Statement, we used this approach for copper services rather than modelling the MEA (which would be likely be an FTTP network with costs abated to the level to provide copper services).

2.56 For the reasons set out above, we propose to set charges for LLU services using an anchor pricing approach based on the cost of an ongoing copper access network. We also assume that this network has a steady state level of capital expenditure (capex). This means we allow Openreach sufficient capex each year in our modelling to replace assets as they become depreciated. We set out in Section 4 how we have modelled this network. We are using a top-down model based on BT's accounting data to calculate the cost of providing LLU services, with some adjustments made where appropriate in order to ensure consistency with our overall approach to modelling.

Adjustments to the top-down cost data

2.57 We aim to set prices for copper services that incentivise both efficient investment in new networks and efficient migration of consumers between legacy and new

[39] When using an MEA approach abatement occurs to reflect the fact that the modern technology is likely to have greater functionality than the legacy technology. The cost of this higher functionality should not be recovered from existing services that could be served by the legacy (lower functionality) technology.

[40] By proven technology, we mean an established technology that is currently offering the services that we are seeking to charge control.

networks, to promote sustainable competition and confer the greatest possible benefits on end-users (among other objectives).

2.58 Top-down accounting data provides us with a proxy for the economic cost of a network but it may not always accurately reflect the ongoing economic cost of running the network. If these costs are not accurately reflected, then the prices we set may not provide the right incentives for other telecoms providers to build their own networks (i.e. if the price of MPF+ GEA was artificially low because the accounting value of assets did not reflect their economic value). Likewise, we would not wish to set artificially high prices if the accounting costs were higher than the economic costs of running the network, as we would expect this to harm consumers through higher retail prices.

2.59 We have made two adjustments to the top-down cost data provided to us by BT so that our cost estimates better reflect the economic cost of providing MPF services. These are the ongoing network adjustments to BT's cost data and taking account of the scrap value of copper.[41]

Ongoing network adjustments

2.60 A potential drawback of using accounting depreciation (and straight line depreciation in particular) is that the accounting value of an asset can sometimes diverge from the economic value of the asset. This divergence could happen for several reasons including the accounting lives being different from actual assets' lives or services provided by an asset being unevenly split over its life.

2.61 If asset lives are different from accounting lives, then an asset will be depreciated too quickly or too slowly. In the extreme, this could leave us with an asset that is near fully depreciated but still has many years of useful life ahead of it. If we set charges based on the accounting value of the fully depreciated asset, we may be setting them at an inefficiently low level. For example, artificially low copper prices may delay consumer migration to SFBB and may impact on other telecoms providers' incentives to deploy their own networks.

2.62 Determining whether the accounting value of an asset is materially different from the economic value of the asset is not a simple task. In past charge controls (including the 2014 FAMR Statement) we used the concept of an ongoing network to proxy the economic value of the asset. As discussed in Annex 11, we have identified a small number of assets that require ongoing network adjustments.

Value of scrap copper

2.63 As discussed in Annex 18, we have assessed the value of the scrap copper that we believe may be realised when BT removes its copper access network. The depreciation of an asset should reflect the change in value of the asset over the time it is held by the firm. Often we will assume that we are depreciating an asset to a value of zero, which is the point at which it is disposed of. If an asset will have some residual value once the firm has finished using it, then the amount of depreciation incurred (and consequently the cost of using the asset) will reduce.

2.64 In the 2014 FAMR Statement we did not consider it appropriate to capture the impact of value of copper scrap. We were concerned that including the copper scrap

[41] We make other adjustments to BT's accounting data as described in Annex 11, but these are not linked to our general modelling approach.

recovery value would be inconsistent with using the anchor pricing approach because we were modelling a network that was ongoing and so would not have its copper removed. We also considered that it was highly uncertain to what extent the copper scrap value would have on our cost estimates given it was not clear whether the copper scrap would have a positive net value.[42]

2.65 Although we are still using an anchor pricing approach, after further consideration we now believe this can be consistent with capturing the value of copper scrap at that stage. As discussed above, we use the anchor pricing approach in order to capture the economic cost of providing MPF services and because it sends efficient pricing signals. The ongoing network adjustments are not an aim in themselves, but are used to adjust the assets accounting value so it better reflects the economic value. We also now have a better understanding of the scrap value of copper in BT's network and we believe that it will be a material future revenue stream.

2.66 Including the impact of the residual copper has the same aim as the ongoing network adjustments. Accounting for the residual value of an asset is an important part of any investment decision. Any decision to invest in a network would take account of the potential for the recovery of residual asset values at the time of disposal. We therefore believe that in order to send efficient pricing signals, the revenue earned from future copper sales should be included.

2.67 We consider how to capture the impact of copper scrap on charges in Annex 11. The revenue earned from future copper sales is due to the residual value of assets in the copper network and we believe it is appropriate to spread revenue earned from copper sales over all copper lines. We do this by calculating the present value of the scrap copper sales and converting this into a yearly adjustment that we apply to both WLR and MPF rentals in our top-down model.

Level of faults for our modelled network

2.68 In order to maintain its network, Openreach will incur both capex on acquiring and retaining physical assets and operating expenditure (opex) relating to the cost of operating and maintaining the physical assets. This includes the costs of repairing network faults when they arise.

2.69 In Section 4 of our 2017 QoS Consultation, we discuss our analysis that shows Openreach has been underspending on capex versus the allowance we included in our previous cost modelling.[43] Our analysis suggests that Openreach's capex has been lower than the level required to replace the assets that have reached the end of their useful lives. At the same time, Openreach has been incurring higher opex than we expected from our previous forecasts. This suggests to us that Openreach may be incurring additional opex in order to maintain equipment that is old and becoming heavily depreciated.

2.70 Although we are not usually concerned about whether Openreach favours capex or opex, we would be concerned if this choice led to higher overall service costs. To ensure the charge controls we propose to set are appropriate for the purposes of promoting efficiency (among other objectives), we wish to model the cost of an efficient well maintained ongoing network and we would expect the networks fault rate to reflect that it is in an ongoing state. We noted in Section 4 of the 2017 QoS Consultation that prioritising opex over capex is only feasible for a limited amount of

[42] 2014 FAMR Volume 2, Section 3.59 to 3.66.
[43] Ofcom, 2017. *QoS Consultation*.

time before network reliability diminishes. We also note that Openreach has embarked on a preventative maintenance capex programme in order to reduce its fault rate.

2.71 As described in Annex 11, we believe that the capex we allow Openreach in our steady state ongoing network is sufficient for it to maintain its network with a low level of faults. When modelling the cost of dealing with faults, we wish to set the fault rate at the level it would have been at if Openreach had invested the capex we allowed it in the last charge control. We believe that Openreach's current plans give us a way to proxy this level of faults and we therefore propose to use the fault level that Openreach believes it will reach after its preventative capex programme.[44]

Network choice for SFBB

2.72 SFBB services can be delivered over a number of different technologies. We set out in Section 4 and Annexes 12 and 20 the precise technological configuration of the network that we are proposing to model and respond to stakeholders' comments to the May 2016 WLA Consultation on fibre cost modelling.

2.73 As with our copper network modelling, we propose to use an anchor pricing approach and set prices on the basis on an FTTC network. Our anchor pricing approach means we do not model directly the deployment of any other variant of next generation high speed access that could be used to provide SFBB (e.g. G.fast, FTTP).

2.74 The inputs that we use for estimating FTTC costs should not need the same sort of adjustments as those we used for the top-down cost estimates (i.e. adjustments so that the accounting value of assets represents the economic value). We are using a bottom-up model to calculate the cost of FTTC services and our bottom-up model is designed to calculate the costs of an ongoing efficient network. Therefore no further adjustments should be necessary.

2.75 As discussed above and in Annex 12, we propose to use a CCA depreciation approach in our bottom-up model, rather than economic depreciation. There is a risk when using CCA depreciation that costs are unstable because of volume changes or spikes in capex due to where we are in the investment cycle. However, as described in Annex 12, we have performed cross-checks to ensure this has not happened in our model and do not believe further adjustments are necessary.

Duration of the LLU and VULA charge controls

2.76 The previous charge control was set with a three year duration[45], and we propose to maintain this approach for the next charge control. This will align the charge control with the market review cycle specified in the Framework Directive.[46]

Balance between dynamic and static efficiency

2.77 As noted above, we must, under section 88 of the Act, take a view on what appears to us to be appropriate for the purposes of (among other things) promoting efficiency.

[44] We identify in Section 4 of the 2017 QoS Consultation that we believe Openreach will be able to reduce its fault rates from [✂]% to [✂]%.
[45] Due to a delay in the publication of the statement, the actual duration of the charge control was 2 years and 9 months.
[46] Article 16 of the Framework Directive 2002/21/EC, as amended by Directive 2009/140/EC.

We have therefore considered what duration of control will best promote efficiency and, in particular, will strike the appropriate balance between dynamic and static efficiency. In this case, we would be concerned if a shorter control undermined incentives for BT or other telecoms providers to invest because of lack of certainty around the regulatory environment.

2.78 All other things being equal, a longer charge control period creates stronger incentives for dynamic efficiency compared to a shorter period. A longer charge control period gives BT more opportunities to enhance its profitability through innovation and cost reduction. However, the re-setting of new controls allows us to ensure that allocative efficiency objectives are met by setting the new control to bring charges into line with costs.

2.79 Price cap regulation trades-off some allocative efficiency in return for greater dynamic efficiency. The longer the duration of the cap, the greater is the incentive to reduce costs, but the higher is the potential cost in lost 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.

2.80 We consider that a shorter time period than the period covered by the market review (i.e. three years) would not be appropriate. 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 also allows those using BT infrastructure to better plan their own investments in capital and business processes. It would also allow more certainty for those telecoms providers who were planning to make their own network infrastructure investment as to the regulatory environment that they face.

2.81 Conversely, given the extent of supply-side changes anticipated over this market review period (e.g. further ultrafast investment, investment in systems and processes such as quality of service, the development on the new PIA remedy) as well as potential demand-side changes (e.g. demand for different voice and broadband forms of access) there is a risk that our forecast of efficient costs becomes outdated, which may also distort investment incentives. This forecast uncertainty would be mitigated by adopting a shorter charge control period.

2.82 We believe that a charge control period of three years strikes an appropriate balance between forecast uncertainty and providing regulatory stability for stakeholders.

Speed of aligning charges with costs

2.83 Having considered the appropriate duration for the charge control, we now consider how regulated charges should evolve from current levels to the forecast efficient level.

General approach to glidepaths

2.84 In setting charge controls, particularly where the controls replace similar existing controls (as is the case for the proposed MPF charge controls), we generally have a preference for glidepaths rather than one-off adjustments.[47] Glidepaths involve

[47] See 2015 BCMR Statement Vol 2 Section 7.4 onwards
https://www.ofcom.org.uk/__data/assets/pdf_file/0015/72312/bcmr-final-statement-volume-two.pdf

setting the control so that there is a gradual convergence of prices from the current level to the target level (based on our projection of the efficient level of costs).

Glidepaths incentivise efficient investment when resetting a charge control

2.85 One of the features of price cap regulation is that profits may diverge from the level expected at the time when the control was set. Any such divergence may be taken into account when the price cap (i.e. the level of X) is reset in the next charge control review. This can be done through either a one-off adjustment to prices, which would reduce prices to our estimate of cost in the first year of the control, or a glidepath to a subsequent point in the control period.

2.86 A glidepath approach approximates more closely than one-off adjustments the workings of a competitive market in which excess profits tend to be gradually eroded as rivals improve their own efficiency. It avoids discontinuities in prices over time and leads to a more stable and predictable background against which investment and other decisions may be taken, by both suppliers and customers, in the telecoms market.

2.87 This approach has greater incentives for efficiency improvement as it allows the firm to retain the benefits of cost reductions made under a previous charge control for longer. One-off adjustments to prices would reduce the effective regulatory lag, and hence the incentives to reduce costs.

2.88 Likewise, if prices are increasing, a one-off increase would similarly raise concerns about incentives for efficiency. Allowing a rapid rise in charges would signal that cost increases would quickly be followed by prices rises. If costs were quickly passed through to charges it could reduce the regulated firm's incentive to control costs.

2.89 The drawback of using a glidepath is that, when costs are falling, it keeps charges above costs for an extended period of time. While we prefer glidepaths for price stability and cost reduction incentives, we consider the case for a one-off adjustment is stronger where charges were not previously regulated and where charges are materially out of line with the costs of provision. Where we have introduced a new charge control on a service for the first time, it has been common for us to use one-off adjustments to align charges with costs quickly in order to maximise allocative efficiency.

Proposed glidepath for SFBB rentals

2.90 We propose to impose a charge control on SFBB for the first time and therefore some of the efficiency considerations set out above are less relevant. We would not have the same concerns regarding dynamic efficiency as we would have if we were moving between charge control periods. On this basis, there would appear to be a case for a one-off adjustment to 40/10 GEA charges. However, we believe there are other factors that mean a glidepath better achieves our goals of incentivising fibre investment (both by BT and other telecoms providers).

and 2014 FAMR Statement Vol 2 Section 6.35 onwards https://www.ofcom.org.uk/__data/assets/pdf_file/0032/78836/volume2.pdf for a discussion of our preference for using glidepaths and examples of where we have used one-off adjustments.

Using a glidepath to incentivise investment in ultrafast

2.91 In Volume 1 Section 8 we discuss whether the 'fair bet' for Openreach's FTTC investment has been achieved. Allowing the fair bet to be met means that we honour the regulatory assumptions that would have been necessary at the time of BT's past investment to make that investment viable. By taking account of the fair bet in the way we impose regulation, we make it more likely that BT (and others) will invest in the future.

2.92 Determining whether the fair bet has been achieved is a matter of some judgement. The speed of adjustment to charge controlled prices is relevant to whether the fair bet has been met. The longer we allow BT to price above our estimate of the cost of provision of 40/10 SFBB services, the greater BT's returns on its investment and the more likely the fair bet will have been met.

2.93 As we set out in Annex 8, an important reference point for whether the fair bet has been met is whether BT has had pricing flexibility for a period of time equal to the expected payback at the time the initial investment was made. We also set out why allowing BT pricing flexibility would be generous. In our view, BT would have expected to reach payback within this market review period.

2.94 As discussed in Volume 1 Section 8, as part of our analysis of whether the fair bet has been met, we have also calculated BT's internal rate of return (IRR) of its FTTC investment over a 20 year period. We have estimated that if we use a one-off adjustment to 40/10 SFBB services, which sets prices at the cost level in 2018/19, BT's IRR would be approximately 11.6%. If we use a one year glidepath,[48] which sets prices at the cost level in 2019/20, we estimate the IRR as 11.8% and for a two year glidepath, which sets prices at the cost level in 2020/21, we estimate the IRR as 12.7%. Higher returns provide an indication that the fair bet has been met, but it is not determinative. It is also important that we take account of the asymmetric risks of regulatory error. In our judgement, a one or two year glidepath would be more consistent with our view that the fair bet has been met.

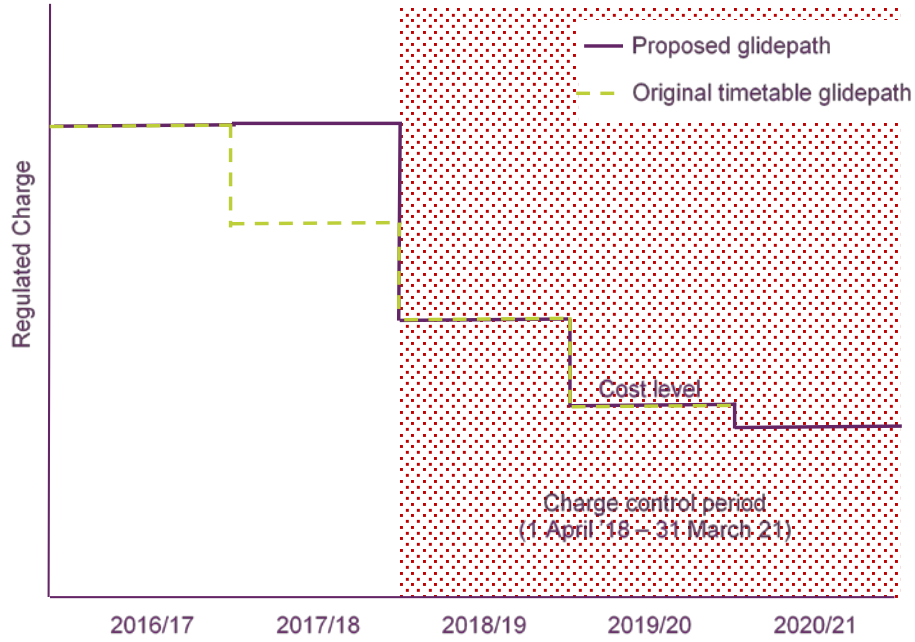
2.95 We also focus on encouraging sustainable competition at a network level, since this has the potential to generate significant dynamic benefits. In considering whether a one-off adjustment is appropriate here, we have placed considerable weight on the likely impact on investment.

2.96 One-off adjustments could have an adverse impact on the investment decisions of BT's competitors. Broadband providers such as Virgin Media may have made investments based on the current VULA price and any sharp price adjustments may impact on those investments, resulting in a reluctance to continue investing in this or other projects.

2.97 We propose the regulated price cap of BT's 40/10 VULA product should follow an adjusted glidepath to cost on 1 April 2019, with a one-off adjustment in 2018/19 to the level the price cap would have been at if we had set the charge control to commence on 1 April 2017. We set out below a stylised example of our proposed glidepath and how it relates to our original timetable glidepath in the figure below.

[48] This one year glidepath also includes a one-off adjustment for the first year of the charge control as described in Section 3.

Figure 2.3: Stylised example of our proposed glidepath approach



2.98 In our judgement, given the importance of the fair bet in preserving BT's incentives to invest and the risk of regulatory error if we were to intervene too early, our proposed approach provides sufficient protection to superfast broadband customers from the risk of higher prices while allowing other telecoms providers to compete with BT for those customers as well as preserving BT's incentives to invest.

Proposed glidepath for MPF rentals

2.99 In past LLU charge controls we have used glidepaths to move charges from their current level to our estimate of cost. MPF prices are therefore subject to the dynamic efficiency arguments that we set out above. We are proposing a relatively modest change to the MPF charge compared to 40/10 VULA prices, there is therefore not a major misalignment of prices that needs to be addressed. Additionally, there is benefit from having the same transition profile to the new price level for GEA and for MPF. As discussed above, we are allocating common costs between these two services as part of estimating their costs. If we used a different transition path between the two sets of services, this could lead to unintended over- or under-recovery of costs, or distort incentives for customers choosing between the services.

2.100 Although we believe a glidepath is appropriate for MPF services, we do not believe that BT should unnecessarily benefit (or be penalised) for the delay in the start of the new charge control. We therefore propose, as with 40/10 GEA, to use a one-year glidepath and move MPF prices onto the path of prices that they would have been on if the charge control had not been delayed.

Consultation questions

Question 2.1: Do you agree with our proposal to impose an inflation indexed price cap, with CPI as the relevant measure of inflation? Please provide reasons and evidence in support of your views.

Question 2.2: Do you agree with our proposal to use CCA FAC to establish the cost base for WLA services and to use LRIC+ to estimate the costs of MPF services and 40/10 GEA services? Please provide reasons and evidence in support of your views.

Question 2.3: Do you agree with our proposal to apply the anchor pricing principle by means of an ongoing copper network with an FTTC overlay? Please provide reasons and evidence in support of your views.

Question 2.4: Do you agree with our proposal to set charge controls for MPF and 40/10 GEA services that expire on 31 March 2021? Please provide reasons and evidence in support of your views.

Question 2.5: Do you agree with our proposal to use a one-year glidepath to align charges with costs in 2019/20 for these charge controls? Please provide reasons and evidence in support of your views.

Section 3

Charge control design

3.1 In Section 2 we set out our objectives and principles we propose to apply in the implementation of charge controls on WLA services. We also set out our key proposals for how we plan to implement the charge controls. In this section we set out our proposed choice of cost standard and principles for basket design, and our proposed approach to the design of the charge controls for LLU and GEA services. We set out our proposals with respect to:

- the form of the charge controls on MPF and GEA rentals; and
- the treatment of LLU and fibre ancillary services that telecoms providers must use in order to provide (and stop providing) voice and broadband services.[49]

3.2 In the 2016 NMR Consultation we proposed that BT's WLR services should be subject to a fair and reasonable charging obligation, rather than a cost-based charge control. We therefore make no proposals in this consultation for any controls in respect of WLR, (including WLR Caller Display).[50]

3.3 As set out in Volume 1 Section 9 we propose that SMPF rentals will no longer be subject to a charge control. In this section, we consider whether charge controls on other services are necessary, for example to support our regulation of MPF and GEA services.

Summary of proposals

3.4 The following paragraphs provide a summary of our proposals for charge control design. A description of each of the relevant services is provided in subsequent paragraphs.

MPF and GEA rentals

3.5 We propose to:

- set a charge control for MPF (Service Maintenance Level 1 (SML1))[51] rental using LRIC+;

[49] These ancillary services include new connections, migrations, ceases, LLU Co-mingling New Provides and Rentals, Tie Cables, Other MPF ancillaries, GEA Cablelink, VLAN moves applied to GEA Cablelink, bandwidth modify, cancel/amend/modify of services, Time Related Charges (TRCs), MPF Special Fault Investigations (SFIs), GEA optimisation and repair services.
[50] Ofcom, 2016. Narrowband Market Review Consultation, paragraph 1.24. https://www.ofcom.org.uk/consultations-and-statements/category-1/narrowband-market-review.
[51] A description of the four SMLs offered by Openreach can be found at https://www.openreach.co.uk/orpg/home/products/serviceproducts/serviceharmonisation/serviceharmonisation/downloads/SML_fact_sheet_web_vers_phme_61163_2011_09.pdf accessed on 1 March 2017. Note that MPF SML1, though not referred to in Openreach's description, was introduced on 22 November 2015, as indicated by the BT price list for Full MPF. See reference to MPF Discounted Rental (SML1 in service) at https://www.openreach.co.uk/orpg/home/products/pricing/loadProductPriceDetails.do?data=Wk%2B2hSVL2knF5F0Ve%2F1N8zj9r0QWsRm3Qpmu5FcPTOYlMnGHsqdC0vzO163bJmh34D91D7M0q8u%2FIlSgtIFAKw%3D%3D. [accessed 17 March 2017].

- set a charge control for FTTC 40/10 (SML2) rental using LRIC+;
- set a cap for Fibre Voice Access (FVA) provided in combination with FTTP 40/10 rental equal to the sum of MPF (SML1) and FTTC 40/10 (SML2) rentals; and
- set an alignment of charges between FTTC 40/10 and FTTP 40/10 transition service rentals.

MPF and GEA New Connections

3.6 We propose to:

- set a charge control for the basket of MPF New Provides using FAC;
- set separate individual charge controls at LRIC for PCP Only Install and Start of Stopped Line for the FTTC 40/10 service. We do not propose a charge control for FTTC Managed Engineer Install with CP Device;
- set a flat nominal cap for the connection charge of FVA in combination with FTTP 40/10 at the current charge, £117; and
- set a flat nominal cap for the connection charge of FTTP 40/10 transition service at the current charge, £92.

MPF and GEA Migrations

3.7 We propose to:

- set separate individual charge controls on MPF Single Migrations and MPF Bulk Migrations. In both cases we propose to set the controls using LRIC; and
- set a charge control on all "CP-CP GEA Migrations – same product/premises" (applying to FTTC and FTTP) using LRIC.

LLU and GEA Ceases

3.8 We propose to:

- set MPF Cease and SMPF Cease software charges at zero (as under the current charge controls) and recover the FAC of the MPF Cease from the line rental;[52]
- set a charge control for a basket of MPF and SMPF hard ceases services.[53] In addition to this Hard Ceases basket control, we also propose the alignment of charges between MPF and SMPF hard ceases requiring similar engineering activity; and

[52] Note that, with the exception of SMPF soft ceases and the two SMPF remove jumper services which are in the Hard Ceases basket (together with the MPF equivalents), we are not proposing any other specific charge controls for SMPF services. Our proposals allow sufficient price flexibility for BT to recover the costs associated with SMPF soft ceases from other SMPF services.
[53] The "Hard Ceases" basket comprises the MDF Remove Jumper Order Singleton Charge and the MDF Remove Jumper Order Bulk Charge for each of MPF and SMPF variants (four services in total).

- set all GEA Service Ceases (including FTTC and FTTP) to zero and recover the FAC of the GEA ceases from the respective line rentals to ensure consistency with the approach for MPF soft ceases.

Other MPF and GEA ancillaries

3.9 We propose to:

- set LLU Co-mingling New Provides and Rentals basket using FAC (as under the current charge controls);
- set LLU Tie Cables basket using FAC (as under the current charge controls);
- set Other MPF ancillaries basket[54] using FAC;
- set a flat nominal cap for the connection charge of 1 Gbit/s GEA Cablelink at the current charge, £2,000;
- set a flat nominal cap for the connection charge of 10 Gbit/s GEA Cablelink at the current charge, £10,000;
- set a flat nominal cap for the charge of VLAN moves applied to GEA Cablelink Modify transactions at the current charge, £15;
- set the GEA Bandwidth modify charge from any speed to 40/10 (i.e. to the anchor service) using FAC; and
- require alignment of charges between GEA Cancel/Amend/Modify and the MPF equivalents which are charge controlled in the Other MPF ancillaries basket.

LLU and GEA Optimisation and Repair services

3.10 We propose to:

- set controls for MPF and GEA TRCs and MPF SFIs using FAC based charge controls (in the case of MPF, as under the current charge controls); and
- set a flat nominal cap at current charges for Superfast Visit Assure at £130 and Fibre Broadband Boost at £159.

Other charge control related issues

3.11 We propose to:

- require the use of prior year revenue weights for basket control compliance; and
- set a sub-cap on each and every charge within a basket that will be CPI-X+7.5%, which is the controlling percentage for the respective basket plus 7.5%.

[54] As we are not proposing to control any other SMPF ancillaries we have relabelled the “Other LLU ancillaries basket to “Other MPF ancillaries” and set it at FAC. The set of services in the “Other MPF ancillaries” basket therefore corresponds to the sub-set of MPF services in the “Other LLU ancillaries” basket as defined in the 2014 FAMR Statement, Volume 2: LLU and WLR Charge Controls.

3.12 Table 3.1 sets out the basket design structure for the relevant LLU services. The basket revenue in 2014/15 is shown in square brackets (redacted where confidential). Note that the value of X is variable not just with the basket but also with the relevant period throughout the charge control.[55] The baskets in Table 3.1 relate exclusively to LLU services; we propose to set individual controls for GEA services.

[55] Given the lacuna period, we propose that the basket controls should follow an adjusted glidepath, with a one-off adjustment in 2018/19 to the level the basket control would have been at if we had set the charge control to commence on 1 April 2017. See Section 2 above.

Table 3.1: A five-basket structure for relevant LLU services[56]

Basket	Service(s)	X value for CPI ± X control		
		2018/19	2019/20	2020/21
MPF New Provides [£86.7m]	• MPF Standard New Provide £[✂] • MPF Stopped Line Provide (MPF SLP) £[✂] • MPF Working Line Takeover (MPF WLTO) £[✂] • MPF SLP Left in Jumpers (LIJ) [N/A] • MPF WLTP LIJ [N/A]	-27.5%	-15.9%	-5.3%
Co-mingling New Provides and Rentals [£46.1m]	• MPF Hostel Rentals (various services) • MPF Room Build (various services)	+54.6%	+22.9%	-5.3%
Tie Cables [£25.7m]	• Various services	-2.0%	-2.2%	-3.6%
Hard Ceases [£35m]	• MPF MDF Remove Jumper Order Singleton £[✂] • MPF MDF Remove Jumper Order Bulk £[✂] • SMPF MDF Remove Jumper Order Singleton £[✂] • SMPF MDF Remove Jumper Order Bulk £[✂]	-27.6%	-15.9%	-4.7%
Other MPF ancillaries £[✂]	• MPF Tie Pair Modification (3 working day lead time Re-termination) £[✂] • MPF Tie Pair Modification (Multiple Re-termination) £[✂] • Cancellation of MPF orders for Provide, Migration, Modification or Amend £[✂] • Amend Orders. Allowable change to MPF Order £[✂] • MPF Standard line test £[✂]	-55.9%	-34.2%	-6.0%

Note 1: the complete list of individual charges controlled in the Co-mingling New Provides and Rentals basket and the Tie Cables basket is available in the Annex to Condition 7A in Annex 23.

Note 2: we do not have revenues for MPF SLP LIJ, nor MPF WLTO LIJ in 2014/15. In 2015/16, the total revenue for MPF SLP LIJ was £[✂] and for MPF WLTO LIJ was £[✂].[57]

[56] Despite the X dispersion, the revenue weighted average X across the baskets is [✂]%, relatively close to BT's efficiency rate.

[57] BT's response dated 26th January 2017 to follow up question 2 relating to the 19th BT s.135 request.

Sources: 2014/15 total revenues in square brackets taken from BT's 2015/16 WLA Compliance Statement (confidential to BT and non-confidential versions).[58]

Choice of cost standard

3.13 In Section 2, we discuss our general approach to determining the cost standard to use for MPF and GEA rentals where we propose to use LRIC+. However, we also stated that we may use different costs standards for other non-rental services where appropriate to promote competition and encourage investment. The circumstances in which we consider BT should be able to recover only the incremental cost (LRIC) of a service are most likely to be where:

- the service is key to the competitive process, for example, because it supports customer switching between telecoms providers; or
- we are setting charge differentials between substitute services using LRIC in order to give good incentives for cost minimisation.

3.14 As in the 2014 FAMR Statement, we propose to adopt the following approach to setting charge controls:

- For new connection services that are necessary for service take-up, we should impose a FAC-based control. This approach would allow BT to recover efficiently incurred costs and should not adversely affect retail customers. This is based on the observation that telecoms providers may have an incentive not to pass through to customers the full charge they pay to BT for establishing the new connection. Instead, they choose to recover the remainder of new connection-related costs from the ongoing line rental.
- For migrations, we should impose a LRIC-based control that reduces switching costs and brings competition benefits from more effective switching.
- For ceases of an LLU or GEA service we have a preference, where the charge could be passed directly to a consumer and therefore act as a means of customer retention (by imposing a barrier to switching), to minimise charges by using a LRIC-based control.[59] Where the LRIC of these charges is low, such as in the case of soft ceases, we propose to set controls at zero.[60] We do not however, propose a LRIC control for hard cease[61] activities which are not related to a

[58] BT, 2016. Local Loop Unbundling and Wholesale Line Rental Price Control – Non-confidential Compliance Statement – 2015/16. http://www.btplc.com/Thegroup/RegulatoryandPublicaffairs/Financialstatements/2016/LLU_WLRpricingcompliancemodel2015-16non-confidentialv1.xlsx. [accessed 17 March 2017].
[59] While cease charges can be considered a type of switching cost they are paid by the losing telecoms provider. Switching costs, unlike cease costs, are generally charged to the gaining provider.
[60] At the retail level, when setting prices, a gaining telecoms provider has an incentive to minimise customers' switching costs in order to attract customers. Often when a customer switches to a new provider, the gaining telecoms provider does not directly pass through to customers the charge it pays to BT for establishing the service. Instead, the gaining telecoms provider chooses to recover these costs from the ongoing line rental. The losing telecoms provider cannot recover the cease charges in rentals once the line service is ceased. However, in the case of early termination charges the losing telecoms provider has an incentive to maximise the level of the charge as it may act as a barrier for customers to switch away from the telecoms provider's service.
[61] Hard ceases consist of the physical removal of a jumper from the MDF.

specific customer activity and so do not represent a barrier to customer switching and, ultimately, to competition.[62]

3.15 In some circumstances a flat cap set either in nominal or real terms is more appropriate than a cost based control. We would consider the use of an unmodeled price cap where it would not be possible for us to accurately model costs and we believe a flat cap is a reasonable proxy. This would also be considered where we believe a flat cap is consistent with our expectation of costs of the service (based on the evidence available and having regard to our objective of encouraging efficiency) and so producing a model would be disproportionate. Examples of when we may face this situation are where:

- we are concerned that the service in question is already important to users, or is likely to become important to users during the charge control period even if it is relatively new and so volumes are currently low;
- we have insufficient information to apply a cost based control;
- current and forecast volumes are unknown or volatile; and/or
- prices have remained stable for a number of years.

Principles for basket design

3.16 A charge control basket is defined as the group of services that are subject to a common charge control restriction. Combining services in a single basket means that the price cap (e.g. CPI-X) would apply to a weighted average of the changes in the charges of the services in the basket.

3.17 In designing the proposed charge control baskets, we have been guided by the following principles:

- Where the services being considered share substantial common costs, a single basket is more conducive to efficient pricing and cost recovery.
- 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 charges in a way that adversely affects competition. In this case, we might consider introducing sub-caps or placing the services in separate baskets.
- Differences in charges for substitutable inputs covered by charge controls should reflect the incremental cost difference. This means that the usual argument for a broad basket, that there are benefits from being able to vary relative prices within the basket to reflect differences in demand elasticities, does not apply to substitutable inputs. Moreover, if we wish the difference between charges for two services to align to the differential in incremental costs, we would need an additional control within the basket.[63]

[62] 2014 FAMR Statement, Volume 2.
[63] We have used these principles in previous consultations, for example, in the July 2013 Fixed access market reviews: Approach to setting LLU and WLR Charge Controls – Consultation,

Advantages of broad baskets

3.18 A broad basket would give BT the most pricing flexibility to determine the structure of prices to meet the charge control. Where relative prices can be set to reflect the way demand responds to price changes, this pricing flexibility is more likely to result in charges that recover costs, particularly common costs, in an efficient way.[64]

3.19 A broad basket also allows BT to respond to changes in demand and costs by changing relative prices and re-optimising charges for new patterns of demand. Subject to sufficient constraint on its pricing at the basket level, BT is better placed to assess demand and set the prices for services at a more granular level.

3.20 We consider, however, that such considerations are less directly applicable to migration type services. This is because retail demand for migration services may not be closely linked to the wholesale migration charge; and because migration charges increase switching costs faced by BT's competitors.

Disadvantages of broad baskets

3.21 The main disadvantage of broad baskets is that, in some circumstances, the flexibility to set relative charges can be exploited to harm competition. Two sets of circumstances are particularly relevant:

- BT may have an incentive to price in a manner that favours its downstream operations. 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 competitors. Placing both wholesale services in a single charge control basket without further restrictions could give BT the ability to behave in a way that harms competition.

- There may be differences in the intensity of competition that 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 most competitive services and offset these with increases where competition is weaker.

Addressing the disadvantages

3.22 It is possible for the competition concerns identified above to be addressed by using more narrowly defined baskets. Each basket could be defined to include only services where there is broadly the same degree of competition, and there could be separate baskets for services that are used predominantly by BT on the one hand, and for services which are mainly used by its competitors, on the other.

3.23 Alternatively, or in addition, sub-caps or inertia clauses within a basket can also be used to address the competition concerns identified above. In this way, the potential

paragraph 4.18, https://www.ofcom.org.uk/__data/assets/pdf_file/0030/58575/llu_wlr_cc_2014.pdf. Also, these principles take into account our objectives set out in paragraph 2.4 above.

[64] In this case, efficient means a set of prices with mark-ups over marginal (or incremental) costs which least distort consumption relative to the consumption which would prevail with prices at marginal (or incremental) cost. This is known as Ramsey pricing as explained in Section 2.

harm to competition can be mitigated while, at the same time, retaining the benefits of pricing flexibility.

3.24 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 principle however, the benefits of broad baskets are likely to be larger, the greater the extent of common costs and the greater the similarity of conditions of competition between services in the basket. Broader baskets also reduce the risk of regulatory failure such as the regulator becoming ever more involved in micro-managing detailed pricing decisions, or when the information available to the regulator may not be reliable or may be particularly susceptible to change over time. We discuss our proposals for each charge control basket in sub-sections below.

MPF and GEA Rentals

3.25 Rental charges are the largest contributors to MPF and GEA revenues for BT (and hence expenditure for access seekers).

3.26 In 2015/16, the actual total revenue for:

- MPF rentals was £783.7m (of which £768.6m was external);[65]
- FTTC rentals was £[✂] (of which £[✂] was external);[66] and
- FTTP rentals was £[✂] (of which £[✂] was external).[67]

MPF rental

3.27 MPF allows a competing telecoms provider to provide a customer with voice and SBB services. MPF is also used to provide the FTTC form of GEA services.[68]

3.28 In the 2014 FAMR Statement we imposed a charge control on MPF rentals. BT offers MPF rental services at different standard SMLs. The current charge control applies to SML2, which was the MPF SML variant most used by telecom providers at the time the current charge control was imposed.[69] Telecoms providers could pay for higher service levels (SML3 or SML4).

Analysis and proposal

3.29 In 2015 BT introduced a further variant of MPF Rental at SML1. This service was priced at a discount to the charge controlled SML2 service.[70]

[65] BT, 2016. Regulatory Financial Statement 2015/16, page 38.
[66] BT's response dated 17th November 2016 to question B5 of the 19th BT s.135 request.
[67] BT's response dated 17th November 2016 to question B5 of the 19th BT s.135 request.
[68] FTTC forms of GEA are currently provided as an overlay to either WLR or MPF.
[69] At the time the current charge control was imposed, MPF's default service level was SML2, 2014 FAMR Statement, Volume 1, paragraph 9.6. Note that MPF Discounted Rental (SML1 in tariff) was launched in 2015, https://www.openreach.co.uk/orpg/home/products/pricing/loadProductPriceDetails.do?data=Wk%2B2hSVL2knF5F0Ve%2F1N8zj9r0QWsRm3Qpmu5FcPTOYlMnGHsqdC0vzO163bJmh34D91D7M0q8u%2FIlSgtIFAKw%3D%3D [accessed 1 March 2017].
[70] At 1/3/2017, SML1 is priced at £85.29/year, while SML2 is priced at £87.65/year. See BT Local Loop Unbundling price list;

3.30 Since the launch of MPF SML1, some telecoms providers have migrated significant volumes of their customer bases from SML2 to SML1. Recent figures show that the majority of MPF lines are now on SML1 rather than SML2.[71]

3.31 Therefore, we propose to impose a charge control on MPF SML1 rather than SML2. We consider that a charge control on SML1 will have greater benefits for downstream competition. Given that BT data gives costs for SML2 we have used this as the starting point to calculate the control for SML1 but have made appropriate adjustments to calculate the cost of the SML1 service.

3.32 We have considered whether it is necessary to propose a charge control on MPF SML2 in addition to that on MPF SML1. We provisionally believe that this would be disproportionate as the fact that telecoms providers have migrated significant volumes to MPF SML1 suggests that this service is likely to be sufficient for telecoms providers in most cases. In addition, SML1 will act as a constraint on SML2 prices as, should BT to greatly increase the price of SML2, the telecoms providers that are still buying the SML2 service are likely to switch to SML1 instead.

3.33 As explained in Section 2, we propose to impose an inflation indexed charge control for MPF rental with a LRIC+ cost standard. Our choice of LRIC+ as a cost standard is based on:

- our preference in general for the application of a cost standard that allows cost recovery of common costs (LRIC+ or FAC);
- an absence of reasons to deviate from our approach (such as the need to prevent barriers to switching); and
- the extent to which costs related with ancillary services not recovered elsewhere are recovered from the main rental charges.[72]

GEA rentals

3.34 We are proposing to charge control GEA rentals for the first time. In Volume 1 Section 8 we set out why we are proposing to charge control 40/10 GEA rentals, connections and relevant ancillaries, while allowing BT continued pricing flexibility on other bandwidth variants in the coming market review period.

3.35 We have set out in Section 2 our proposals for how we plan to charge control 40/10 GEA services using costs based on a national FTTC network. Below, we further detail of our proposals for a charge control on 40/10 FTTP rental services.

https://www.BT.co.uk/orpg/home/services/pricing/loadServicePriceDetails.do?data=totid5BwFmkf9vLcBITRyZF9loRxWIbIKK6V7YWmlYAlMnGHsqdC0vzO163bJmh34D91D7M0q8u%2F%0AIlSgtIFAKw%3D%3D. [accessed 17 March 2017].

[71] 2016, Quality of Service for WLR and MPF. Proposed Directions and Consents relating to the minimum standards and KPIs imposed in the 2014 Fixed Access Market Reviews Consultation. https://www.ofcom.org.uk/__data/assets/pdf_file/0019/71524/quality-of-service-wlr-mpf.pdf.

[72] This is to take into account the costs of other services whose charges were set below FAC (e.g. MPF ceases whose charges we are proposing to set at zero, or migrations whose charges we are proposing to set at LRIC). We have set out above the circumstances in which we consider BT should be able to recover only LRIC of a service.

Charge controlling 40/10 GEA not provided over FTTC

3.36 GEA services can be provided through BT's FTTC and FTTP networks. Where the service is provided through FTTP, in order to take voice as well as data, customers will need to order the FVA product or in some particular cases the Fibre Transition service.

3.37 In order to take a consistent technology neutral approach we consider it necessary to impose a charge control on 40/10 GEA rentals provided through FTTC and FTTP networks. We set out our charge control proposals below in relation to:

- 40/10 FTTP rental combined with FVA; and
- 40/10 FTTP transition rental.

3.38 BT also offers a 40/10 FTTP "data product variant", a data only service, i.e. without voice included. We do not propose to charge control FTTP data variants because the FTTP rentals set out above (which are combined with voice) should impose a competitive constraint on the data variants.

Proposals for FTTP 40/10 rentals with FVA

3.39 SFBB services including 40/10 can be provided across BT's FTTP network. The FVA service in combination with FTTP 40/10 offers an equivalent service to FTTC 40/10 with WLR or MPF. FTTP rental volumes are currently [✂].[73] As is consistent with our technology neutral approach, we think that equivalent services provided via different networks and technologies should have the same charges. Thus, customers in FTTP-only areas should have the price protection applicable to equivalent FTTC services. Without this, there would be a risk that such products would be excessively priced, leading to detriment for customers in those areas. Therefore, we propose a cap for FVA provided in combination with FTTP 40/10 rental that is equal to the sum of MPF and FTTC 40/10 rentals.[74]

3.40 As we propose to charge control MPF SML1, we propose to use the sum of MPF SML1 with FTTC 40/10 charges as the benchmark for the sum of FVA with FTTP 40/10.

Proposals for FTTP 40/10 transition rentals

3.41 It is not possible to deliver FVA in all areas where FTTP has been deployed. In those cases, as an interim alternative, BT offers an FTTP transition service[75] which, like FTTC services, is only available in conjunction with an existing WLR or MPF service.[76]

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[73] BT's response dated 27 February 2016 to follow up questions relating to questions 5 and 6 of the 1st BT s.135 request.
[74] The case of FVA alone is discussed in the 2016 NMR consultation, paragraph 4.2. In particular, we said that FVA is provided in a limited number of cases and proposed to continue to include it within the WFAEL market definition.
[75] BT's price list, "Transition Product" Variants at https://www.openreach.co.uk/orpg/home/products/pricing/loadProductPriceDetails.do?data=SjLGnN8O1mzybN7g39pZiNKvrleClYZjBLZ4w%2FibaalZ6rNZujnCs99NbIKJZPD9hXYmiijxH6wrCQm97GZMyQ%3D%3D [accessed 1 March 2017].
[76] The FTTP transition service delivers data on fibre, while voice is provided on copper.

3.42 The annual rentals for the FTTP 40/10 transition service and FTTC 40/10 are currently aligned at £88.80. Given the equivalence between the two services and our technology neutral approach, we propose that their charges should be kept aligned (at the level of the FTTC 40/10 charge control) over the course of the next WLA market review period.

MPF New Connections

3.43 MPF New Provide service variants are requested by telecoms providers when a new customer connection is required. In 2015/16 telecoms providers spent approximately £86m in total on MPF New Provide services.[77]

3.44 In the 2014 FAMR Statement we put the three MPF New Provide Services: MPF Connection Charge Stopped Line Provide (SLP); MPF New Provide Standard; and MPF Working Line Takeover (WLTO) in one basket and set the basket average charge to align with projected FAC by the end of the charge control period.[78]

Analysis and proposals

3.45 We have considered whether a basket charge control which allows BT to recover its FAC costs from MPF New Provide services remains appropriate in the context of the principles that we have set out.

3.46 In our view a basket charge control for the three MPF New Provide Services remains appropriate because:

- In some circumstances the services in the MPF New Provides basket are substitutable.
- Sub-caps for each MPF connection service in the basket that limit the rate of change in individual charges coupled with the overall basket control will restrict the scope to game the controls via the differential between charges in the basket. Sub-caps provide some degree of protection to customers from the risk of large price increase, and mitigate the risks of gaming the basket control whilst allowing some pricing flexibility.

3.47 We note that BT introduced two new MPF connection services in November 2014 following the publication of the 2014 FAMR Statement:

- MPF Connection Charge Stopped Line Provide (SLP) Re-using existing LIJ; and
- MPF Working Line Takeover (WLTO) Re-using existing LIJ.

3.48 The charges for these services have reduced from £15 to £12.73 as at March 2017.

[77] BT, 2016. Regulatory and Financial Statements 2015/16, p. 38. http://www.btplc.com/Thegroup/RegulatoryandPublicaffairs/Financialstatements/2016/index.htm [accessed 1 March 2017].
[78] 2014 FAMR Statement, Volume 2 paragraphs 4.33-4.40.

3.49 In 2015/16, these two new services generated revenue of £[✂] respectively for BT.[79] The other MPF connection services generated revenues of £[✂] for MPF Standard New Provide, £[✂] for MPF WLTO and £[✂] for MPF SLP in 2014/15.[80]

3.50 We have considered whether the two LIJ services should explicitly be included in the MPF New Provides basket. We understand that the two LIJ services do not entail engineering activity and the cost of their provision is likely to be low. We consider that their inclusion in the new provides baskets would:

- ensure that charges are brought closer to costs and BT does not over-recover its costs, with benefits to allocative efficiency;[81] and
- be consistent with cost information used to set the control (i.e. the MPF New Provides basket FAC).

3.51 We have considered, in line with our principles, whether a FAC cost standard is appropriate. As we have explained above, we consider that BT should be able to recover all of the costs of service take-up associated with new provides. Furthermore, we do not consider that a FAC cost standard will impose barriers to take-up of an MPF service as telecoms providers continue to be able to spread the cost of an MPF New Provide service over the term of a retail contract.

3.52 We propose a basket charge control for MPF New Provides that includes the five services discussed above. We also propose sub-caps for each MPF connection service in the basket of CPI-X+7.5%. We explain our rationale for proposing sub-caps later in this section.

GEA Connections

3.53 In the 2014 FAMR Statement, we decided not to control the level of any GEA connection charges during the market review period concerned, allowing BT to retain pricing flexibility on GEA pricing.[82]

Analysis and proposals

FTTC Connections

3.54 There are three FTTC connection services:

- PCP Only Install: a BT engineer makes a connection at the street cabinet installing the jumper cable required to connect the FTTC fibre network to the D-side copper network;

[79] BT response dated 26 January 2017 to clarification request, question 2, relating to the 19th BT s.135 request.
[80] BT's 2015/16 LLU WLR Compliance Statement. The individual revenues for 2015/16 regarding MPF Standard New Provide, MPF WLTO and MPF SLP will be available in the 2016/17 LLU WLR Compliance Statement which BT must provide to Ofcom no later than 30 June 2017.
[81] This relates to our objectives set out in Section 2 above, in particular of protecting consumers against the risk of high prices.
[82] 2014 FAMR Statement: Volume 1, paragraph 1.35.

- Start of Stopped Line: a software only exchange connection requiring no engineering activity; and

- Managed Engineer Install: a BT engineer makes a connection at the street cabinet if required and installs the modem at the customer premises.[83]

3.55 FTTC connection services are necessary to provide an FTTC service for a customer for the first time (or re-activate). A charge control on FTTC connections is necessary alongside the FTTC rental charge control, otherwise BT could circumvent the charge controls for FTTC rentals by, for example, raising the charge of the respective connection services.

3.56 However, we do not consider that it is necessary to impose charge controls on all three FTTC connection services. PCP Only Install and Start of Stopped Line account for the vast majority of FTTC new connections and a charge control on these services should impose a constraint on prices of Managed Engineer Install, to the extent that there is a degree of substitution between the services. We propose that Start of Stopped Line should be subject to a separate charge control for two reasons:

- we would expect it to be an increasingly important service as FTTC is rolled out; and

- by 2020/21, the LRIC for Start of Stopped Line (£2.95) is substantially lower than the LRIC for PCP Only Install (£42.12). Thus, a LRIC-based charge control for PCP Only Install alone would impose a light and likely insufficient competitive constraint on Start of Stopped line.

3.57 We propose to only charge control connections for 40/10 GEA services because:

- the charge controls on 40/10 services act as a constraint on the charges for other speeds, including their connection charges;[84] and

- a charge control on connections for other speeds would not be effective. BT could circumvent the charge control by, for example, raising the price of rentals for other GEA speeds that we are not proposing to charge control.

3.58 While in principle we consider new connections should be controlled using a LRIC+ cost standard, we consider that a LRIC cost standard is appropriate for GEA-FTTC connections because these connection services can be construed as migrations from SBB to SFBB services, which we want to facilitate.[85] To this end we believe that customers should face low barriers to switching when upgrading from SBB to SFBB

[83] The charges for these three services have not changed since the 2014 FAMR. See BT's FTTC price list https://www.openreach.co.uk/orpg/home/products/pricing/loadProductPriceDetails.do?data=0RIviN9gWGKtCdDGaQ8IFObCjmFDJOVDZEidKC%2F1wh1Z6rNZujnCs99NbIKJZPD9hXYmiijxH6wrCQm97GZMyQ%3D%3D [accessed 1 March 2017].

[84] See Volume 1, Section 8.

[85] In page 5 of our initial conclusions from the Strategic Review of Digital Communications (25 February 2016) we said that we will encourage deployment of new ultrafast networks as an alternative to the copper-based technologies. In our view, it is important to facilitate switching from copper to new faster networks to encourage large-scale deployments of the latter. Also, facilitating switching from SBB to SFBB promotes increased choice of broadband services and ultimately competition between SBB and SFBB services and telecoms providers. https://www.ofcom.org.uk/__data/assets/pdf_file/0016/50416/dcr-statement.pdf.

services. We note that a move from SBB to SFBB might also involve changing telecoms provider and in previous charge controls we have used a LRIC cost standard for migrations.[86]

3.59 We therefore propose to charge control the following two FTTC connection services for the FTTC 40/10 bandwidth variant only:

- PCP Only Install for 40/10 FTTC using LRIC; and
- Start of Stopped Line for 40/10 FTTC using LRIC.

FTTP Connections

3.60 We believe that, in principle, our approach to setting FTTC connection charge controls at LRIC is also applicable for GEA FTTP connection charges. As explained above for FTTC connections, to facilitate competition we consider that customers should face low barriers for FTTP connections, which we consider to be similar to migrations. Moreover, a switch from Openreach copper to FTTP might also involve changing telecoms provider at the retail level.

3.61 However, in the case of FTTP connections a LRIC cost standard would be difficult to implement in practice in the next market review period. This is because of the lack of detailed cost information about the required engineering activities, low current volumes and the uncertainty about future volume growth for FTTP connections. We therefore believe that it would not be possible for us to calculate a LRIC for FTTP connections. Given that the volume of FTTP connections is low, we can protect competition over the period of this review by setting FTTP connection charges at their current level.

3.62 We do not propose to charge control FTTP connections for service speeds other than the anchor at 40/10, for the reasons set out in relation to FTTC connections in Section 3 above.

3.63 We therefore propose a flat nominal cap[87] for the connection charges of:

- FVA combined with FTTP 40/10 at the current charge level, £117; and
- FTTP 40/10 transition service at the current charge level, £92.

MPF Migrations

3.64 High migration charges at the wholesale level, if passed through to retail customers, may increase customers' switching costs and reduce competition between telecoms providers. We have highlighted the importance of switching costs on competition in previous consultations and statements on customer switching.[88]

[86] 2014 FAMR: Volume 2: LLU and WLR Charge Controls. See, for example, paragraphs 4.83 to 4.89 where we decided to control migration charges at LRIC.
[87] We have also considered a flat cap in real terms. However, in view of the low inflation in the recent past and the fact that BT has not changed the connection charge for FVA combined with FTTP 40/10 since 1 April 2013, we think that a flat nominal cap is more appropriate.
[88] Ofcom, 2012. Consumer Switching Consultation, paragraph 1.4, http://stakeholders.ofcom.org.uk/binaries/consultations/switching-fixed-voice-

MPF Single Migration and MPF Bulk Migration

3.65 In the 2014 FAMR Statement we sought to encourage more effective switching and increased competition by setting charges for all migration services, including MPF Single Migration and MPF Bulk Migration, at LRIC. We said the difference between FAC and LRIC (which we estimated was generally small), should be recovered from MPF rental charges on an equivalent per line basis.[89]

3.66 We aligned the charges of MPF Bulk Migration to their volume-weighted average LRIC in 2016/17 using glidepaths.

Analysis and proposal

3.67 We continue to believe that migration charges can be used to impose barriers to switching and that setting both MPF Single Migration and MPF Bulk Migration services at LRIC (as we did in the 2014 FAMR Statement) will encourage effective switching and increased competition.

3.68 As such we propose to:

- set MPF Single Migration charges using LRIC; and
- align the charges of MPF Bulk Migrations using their volume-weighted average LRIC.

3.69 For both MPF Single Migration Charges and MPF Bulk Migration charges the difference between FAC and LRIC (which we estimate to be generally small), should be recovered from MPF rental charges on an equivalent per line basis.

GEA Migrations

3.70 A GEA migration (from CP to CP) charge is incurred when an existing GEA customer wishes to move from its current telecoms provider to another provider while retaining the GEA service. Some GEA migrations, in particular migrations from SMPF, require an engineer to visit the local exchange or cabinet, whilst other GEA migrations do not.[90]

3.71 In the 2014 FAMR Statement we decided that BT should retain pricing flexibility over the level of GEA charges except for a charge control for CP-CP GEA Migrations – same product/premises.[91] We estimated the LRIC for this charge based on limited information, reducing the then existing charge from £50 to no higher than £11 (with no nominal increase in the charge over that review period). We applied the control to the level of the GEA migration charge, for both FTTC and FTTP.

3.72 We also decided to limit BT's flexibility in setting a minimum contract period for GEA following a GEA migration, by requiring it to have a minimum contract term of no more than one month following such a migration.

broadband/summary/condoc.pdf. Ofcom, 2013. Consumer Switching Statement, paragraph 1.2, https://www.ofcom.org.uk/__data/assets/pdf_file/0033/76569/consumer_switching.pdf.

[89] 2014 FAMR: Volume 2: LLU and WLR Charge Controls, paragraphs 4.83 to 4.89.

[90] BT's response dated 17th June 2016 to section H of the 7th BT s.135 request.

[91] 2014 FAMR Statement, Volume 1, paragraphs 1.36-1.38.

Analysis and proposal

3.73 In principle, we consider that it is important to minimise the costs of switching; this is particularly important given BT's high share of GEA connections[92] and our expectation that a significant proportion of fibre retail customers will, over the market review period, continue to be customers of BT's retail divisions. In this context BT has a strong incentive to maintain GEA migration charges at what we now consider to be an excessive level.

3.74 In line with the principles that we have set out, we believe that migration charges should continue to be set at LRIC and should not include a contribution to common costs. We are now able to make a more accurate calculation of LRIC and are thus proposing a significant reduction in the migration charge (estimated £2.95 by 2020/21).[93] The resulting lower switching costs are generally likely to be in customers' interests since they help strengthen retail competition. We propose to allow BT to recover the FAC-LRIC difference from the respective main rentals.[94]

LLU Ceases

3.75 Cease charges can be split into two types:

- soft cease (also known as flexi cease) charges which are for record keeping services (software only); and
- hard cease charges which are for jumper recovery (i.e. physical removal of a jumper from the MDF) and which should only occur once the relevant soft cease has been executed (i.e. the line is ceased via software but jumpers remain in place).

3.76 Where a telecoms provider wishes to disconnect a service, but is content to leave the cabling in place, it would normally only use a soft cease service (which involves only an update to records, not engineering activity). The majority of singleton ceases are soft ceases, involving no jumper recovery.[95]

3.77 The imposition of an LLU cease charge at the retail level may influence customers not to switch providers. We have previously explained that cease charges such as Early Termination Charges imposed by telecoms providers could adversely affect competition and customer switching and that these charges are not transparent to customers. We have highlighted the importance of switching costs on competition in previous consultations and statements on customer switching.[96]

3.78 In the 2014 FAMR Statement we decided to separate out hard ceases into their own basket with the FAC of MPF and SMPF Hard Ceases recovered through the Hard Ceases basket via the "MPF MDF remove Jumper Order Singleton/Bulk Charge" and

[92] 2014 FAMR Statement: Volume 1, paragraph 1.35. BT's response dated 27 February 2016 to follow up questions relating to question 5 of the 1st BT s.135 request.
[93] Bottom-up model LRIC estimate for GEA software services for 2020/21.
[94] This approach is consistent with our proposals for PCP Only Install and Start of Stopped line connections at LRIC (construed as migrations from copper to fibre).
[95] July 2013 FAMR Consultation, paragraph 4.165.
[96] Ofcom, 2012. Consumer Switching Consultation, paragraph 1.4, http://stakeholders.ofcom.org.uk/binaries/consultations/switching-fixed-voice-broadband/summary/condoc.pdf. Ofcom, 2013. Consumer Switching Statement, paragraph 1.2, https://www.ofcom.org.uk/__data/assets/pdf_file/0033/76569/consumer_switching.pdf.

the "SMPF MDF remove Jumper Order Singleton/Bulk Charge" services. We also set MPF and SMPF soft cease charges to zero.

Analysis and proposals

LLU Hard Ceases Basket

3.79 Hard ceases involve removing jumpers from the MDF that would otherwise remain in place after customers switch. Like migration charges, these cease costs can act as a barrier to switching if they are passed through to customers.

3.80 LLU Singleton Jumper removal services are used by telecoms providers when they require BT to physically disconnect cabling they use to connect a copper line to their equipment. This is normally done when the telecoms provider needs space for other services or BT requires the telecoms provider to rationalise the frame space that the telecoms provider uses. Jumper removal services can be a termination cost that telecoms providers face when a customer switches to a new supplier that could be passed onto customers.

3.81 Hard Cease Services continue to be purchased in significant volumes. BT reported a total revenue of £35.3m in 2015/16 for Hard Cease Services compared to £23.1m for Other LLU Ancillary Services, £25.0m for Tie Cables and £45.7m for Co-mingling New Provide and Rental services.[97] Maintaining a Hard Ceases basket that is distinct from other LLU ancillaries should reduce the scope for BT to game basket controls.

3.82 In principle, we consider that unnecessary barriers should not be imposed in relation to ceasing and therefore moving away from MPF or SMPF services. In formulating our proposal, we have reconsidered whether a FAC or LRIC cost standard would be appropriate for the Hard Ceases basket. In our view a LRIC control would be appropriate where:

- the service is only used by BT's competitors and not by BT itself. However, in this case, both BT and other telecoms providers use hard ceases;
- the service is key to the competitive process, e.g. charges for customer switching between operators. Hard cease services are not key for customer switching between operators because customers can, for example, switch providers using migration services; and
- a number of services are substitutes for each other and we want to ensure that charges send the right signal so that providers make the cost minimising choice. In the case of hard ceases we are not setting charges for services which are substitutes for each other.[98]

3.83 We note that the difference between LRIC and FAC for the Hard Ceases basket is low given the low level of common costs allocated to this basket. Therefore, in practice, the cost standard choice for the charge control on hard ceases is unlikely to have a material impact on their basket control.

3.84 Our view remains that consistent with the approach that we took in the 2014 FAMR, the FAC of MPF hard ceases should be recovered through the "MPF MDF remove Jumper Order Singleton/Bulk Charge" service and that the FAC of SMPF hard

[97] BT RFS 2015/16, page 38.
[98] See paragraph 3.13 above regarding the choice of cost standards.

ceases should be recovered through the "SMPF MDF remove Jumper Order Singleton/Bulk Charge" services. We propose therefore to maintain our approach to regulating LLU hard ceases and to impose a FAC-based charge control on the LLU Hard Ceases basket.

3.85 We also propose to keep alignment of charges between MPF hard cease services and the SMPF equivalents, i.e. services that involve broadly similar engineering activity should be charged the same.[99] In 2015/16, we note that less than 2% of MPF rentals were internal to BT, while for SMPF rentals more than 85% were internal to BT.[100] This suggests in the absence of our proposed alignment of charges, BT may have an incentive to concentrate the charge increases on MPF hard cease services in the Hard Ceases basket.

LLU Soft Ceases

3.86 MPF and SMPF soft cease charges are also costs that in retail markets may impose barriers to switching and therefore impede competition. As we have explained above, we consider it important that barriers to soft cease activities (which can be used for all ceases) are minimised. By setting soft cease charges to zero we make it possible for all customers to switch (where the cease is the relevant service) without incurring unnecessary costs.

3.87 Unlike hard cease services, there is no engineering activity for soft ceases and consequently the incremental cost of the soft cease activity is very low. Therefore, we propose that the charges for LLU soft ceases (both MPF and SMPF[101]) should be set at zero. The FAC of MPF soft ceases will be recovered across all MPF line rental charges. For SMPF soft ceases BT will have the pricing flexibility to recover the costs associated with these services from other SMPF services.

GEA Ceases

3.88 In the 2014 FAMR Statement, we decided not to control the level of any GEA cease charges during the market review period concerned, allowing BT to retain flexibility on GEA pricing.[102]

Analysis and proposal

3.89 BT sends an engineer to remove fibre jumpers usually when an end customer wishes to cease the fibre broadband service and revert to MPF, SMPF or ISDN. BT suggested that this only happens in a small percentage of all GEA-FTTC ceases, i.e. the vast majority of GEA-FTTC ceases do not require an engineer to visit the local exchange or cabinet.[103] The engineering activity that comprises a hard cease GEA could also be done as part of a new connection (i.e. remove an existing jumper and provide a new jumper).

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[99] Specifically, we propose the charge for MPF MDF Remove Jumper Order Singleton Charge to be aligned with SMPF MDF Remove Jumper Order Singleton Charge, and the charge for MPF MDF Remove Jumper Order Bulk Charge aligned with SMPF MDF Remove Jumper Order Bulk Charge.
[100] BT RFS 2015/16, page 38.
[101] SMPF is a declining service. We think that telecoms providers should face low barriers in their process of switching away from SMPF. BT is able to recover the costs related with SMPF soft ceases from other non-charge controlled services (e.g. WLR rentals).
[102] 2014 FAMR Statement Volume 1, paragraph 1.35.
[103] BT's response dated 17th June 2016 to section H of the 7th BT s.135 request.

3.90 There is not a GEA equivalent to a telecoms provider ordering an LLU hard cease. In the case of FTTC all the jumpering at the cabinet connects between BT assets. In the case of FTTP BT again provides the network. In both cases, the telecoms provider does not have tie cables specific to the end user. As such, GEA hard ceases would be general network/operational costs incurred by BT.

3.91 Even if there are some costs related to GEA hard ceases, we note that it is rare for a customer to cease an SFBB service to move back to SBB.[104]

3.92 In line with our approach to soft ceases, we do not think that cease charges are appropriate for GEA and so all costs incurred in the above activities should be recovered through the main rental (unless they are recovered through a connection charge, i.e. in the case of a jumper removed at the time of a new connection).

3.93 We propose to set all GEA cease charges at zero and recover the associated costs from the respective main rentals:

- in order to minimise migration costs and promote switching at the retail level; and
- because the incremental costs of a GEA cease are low.

GEA bandwidth modify

3.94 In the 2014 FAMR Statement,[105] we decided not to control the level of any GEA bandwidth charges during the market review period, allowing BT to retain flexibility on GEA pricing.

Analysis and proposal

3.95 GEA bandwidth changes do not require an engineer to visit the local exchange or cabinet.[106] This service is used when a telecoms provider wishes to provide a different (upgrade or downgrade) GEA speed to a customer.

3.96 We propose to set the charges for GEA bandwidth changes from any other SFBB speed to the charge controlled 40/10 GEA service at FAC by 2019/20 (estimated £6.74).[107] By including a charge control on GEA bandwidth changes, we enable the charge control on 40/10 GEA rentals to more effectively constrain prices of other GEA bandwidth variant services.[108] Any GEA customer has the option to switch to the 40/10 GEA service at a charge controlled level.

3.97 We considered whether it would be appropriate to use a LRIC standard for GEA bandwidth changes on the basis that a low charge may mean that the 40/10 GEA service provides a more effective constraint on prices of services at other bandwidth variants. However, in our judgement, a charge control based on FAC provides sufficient protection to ensure the 40/10 GEA charge control is effective.

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[104] See Volume 1, paragraph 3.34.
[105] See 2014 FAMR Statement Volume 1, paragraph 1.35.
[106] BT's response dated 17th June 2016 to section H of the 7th BT s.135 request.
[107] Bottom-up model LRIC estimate for GEA software services for 2020/21 plus an allocation of common costs.
[108] We are not proposing to charge control "Bulk Modification of FTTC to higher speed Bandwidths" (charge at £0.20 as of 1 March 2017). The charge control on single GEA bandwidth changes to 40/10 at LRIC is a ceiling on the charges for the bulk equivalent service. The bulk bandwidth modifications apply to speed upgrades only, while single bandwidth modify applies to any bandwidth change.

3.98 As GEA bandwidth changes are a change of service for an existing customer, prices above LRIC do not inhibit switching in the same way as price above LRIC for services like GEA migration. As such, we do not believe that the pricing of GEA bandwidth changes has a material impact on competition, therefore it is not necessary to price the service at LRIC.

Other MPF ancillaries basket

3.99 In the 2014 FAMR Statement we decided to create a basket called "Other LLU Ancillaries" comprising the remaining MPF and SMPF ancillaries services that we wished to charge control.

3.100 Given a lack of robust cost information available at a sufficiently disaggregated level we set a basket CPI-X charge control where the value of X was the overall efficiency rate of 5% that we used for modelling BT's costs. In addition to the basket control, we required charges between MPF and SMPF services that involve broadly similar engineering activity to be equal.

Analysis and proposal

3.101 The "Other LLU ancillaries" basket currently consists of the following services (both the MPF and SMPF equivalents):[109]

- Tie Pair Modification (three working day lead time Re-termination);
- Tie Pair Modification (Multiple Re-termination);
- Cancellation of orders for Provide, Migration, Modification or Amend;
- Amend orders. Allowable change to Order; and
- Standard line test.

3.102 Without a control BT would be able to raise charges for MPF related activities and therefore distort competition in its favour given our proposal not to impose charge controls for SMPF.

3.103 There is, therefore, good reason to maintain a separate basket for other MPF ancillary services[110] for which revenues of £[✂][111] in 2014/15 remain material in the context of the "Other LLU ancillaries" basket.

3.104 The regulatory reporting requirements imposed in the 2014 FAMR Statement[112] required BT to report detailed FAC for the eleven services in the Other LLU

[109] Note that the "Other LLU ancillaries basket" also comprises the service "SMPF Flexi Cease Fault Investigation Charges".
[110] Note that this is a new basket comprising only the MPF services of the "Other LLU ancillaries basket".
[111] BT's 2015/16 WLA Compliance Statement.
[112] 2014 FAMR Statement, annex 29.

ancillaries basket, which we will use as a proxy to derive an X (as in CPI-X) for the five MPF ancillary services in the proposed MPF ancillaries basket.[113]

LLU Co-mingling (New Provides and Rentals) basket and LLU Tie Cables basket

3.105 Co-mingling services are services used by purchasers of either MPF and SMPF to locate equipment at BT's local exchanges. The Tie Cables basket (see Annex 23) contains 48 services.[114] These include the handover distribution frame (HDF) in the telecoms provider's co-mingling space at which Openreach hands over services to the telecoms provider and services related to the tie cables that connect the HDF to the MDF.

3.106 In the 2014 FAMR Statement we decided to charge control these services within a basket but also to separate Tie Cables services from the Co-mingling basket and renamed the remaining basket as the "Co-Mingling New Provides and Rentals" basket.

Analysis and proposal

3.107 Services within the Tie Cables basket continue to be used by both BT and other telecoms providers but BT accounts for around 75% of revenues (£18.5m versus £6.5m non-BT in 2015/16)[115] while Co-mingling New Provide and Rental services are exclusively used by other telecoms providers (£45.7m in 2015/16).[116]

3.108 Services in both of these baskets are vital for the provision of MPF services and without control BT would be able to increase prices in order to distort competition in its favour, impacting on the effectiveness of MPF regulation.

3.109 In principle, we do not consider that it would be appropriate to set charge controls for the Co-mingling (New Provides and Rentals) or Tie Cables baskets at LRIC or to set the charges in either basket to zero.[117]

3.110 We propose to retain the existing FAC cost standard for the Co-mingling (New Provides and Rentals) basket or Tie Cables basket and allow BT to recover the full costs of providing these services.

GEA Cablelink and VLAN moves applied to GEA Cablelink

3.111 In the 2014 FAMR Statement, we did not set controls on the level of any GEA Cablelink or VLAN moves charges, consistent with our wider policy of allowing BT

[113] In our view this is a reasonable proxy because the other LLU ancillaries basket is symmetric, i.e. it comprises MPF and SMPF equivalent services with similar charges, which implies similar charge-cost misalignments between an MPF service and its SMPF equivalent. From the individual service revenues reported in BT's 2015/16 WLA Compliance Statement, for the financial year 2014/15, we can observe that the [✂].
[114] Annex 23: Draft Legal Instrument. Annex to Condition 7A.
[115] BT's RFS 2015/16, page 38.
[116] BT's RFS 2015/16, page 38.
[117] See paragraph 3.13 above on our choice of cost standard. We do not consider that the services in the Co-mingling New Provides and Rentals or Tie Cables baskets are key to the competitive process, for example to support customer switching between telecoms providers. Also, we are not setting charge differentials between substitute services at LRIC to give incentives for cost minimisation.

pricing flexibility on VULA during the current market review period.[118] However, these services are covered by BT's access obligation and its obligation to provide a VULA service.

Analysis and proposals

GEA Cablelink

3.112 GEA Cablelink is an Ethernet connectivity product used to interconnect BT's GEA-FTTC or FTTP networks to a telecoms provider's network. This service is not the same as the BCMR Ethernet Cablelink suite of services. GEA Cablelink is available in two speed variants, 1 Gbit/s and 10 Gbit/s, with the 10 Gbit/s variant having been commercially launched in 2016.[119]

3.113 GEA Cablelink is an essential service for those wishing to provide SFBB services over BT's FTTC or FTTP networks. Telecoms providers are likely to need to buy more Cablelink as their customer bases grow and as bandwidth demand increases. If GEA Cablelink is not subject to a charge control BT could increase prices and negate the effect of a charge control on the VULA 40/10 service. Therefore, in our view GEA Cablelink should be subject to a charge control to make the GEA charge control effective.

3.114 While the case to impose a charge control seems strong, we are unable to set a cost-based charge control without specific cost information.[120] As an alternative to a cost-based control we have considered the application of either a flat nominal[121] cap or a requirement for fair and reasonable (F&R) charges.

3.115 In our view a flat nominal cap is more transparent and predictable than a fair and reasonable charges remedy and is straightforward to implement. Given the inputs required in the production of Cablelink, we do not expect the incremental cost of Cablelink to increase over the next charge control period. We presume that BT would not intentionally price below LRIC and so the current charges should be above LRIC, thus a flat nominal cap should allow BT to recover at least the incremental costs of these services.

VLAN moves applied to GEA Cablelink Modify transactions

3.116 VLAN moves applied to GEA Cablelink are used for traffic migrations within GEA Cablelink. As telecoms providers install additional Cablelinks, rearranging traffic via VLAN moves may be necessary to make the most efficient use of capacity.

3.117 We consider that a charge control on VLAN moves is necessary to ensure telecoms providers do not face excessive costs in re-arranging traffic to make efficient use of

[118] 2014 FAMR Statement Volume 1, paragraph 1.35.
[119] Openreach's pricing list at https://www.openreach.co.uk/orpg/home/products/pricing/loadProductPriceDetails.do?data=0RIviN9gWGKtCdDGaQ8IFObCjmFDJOVDZEidKC%2F1wh1Z6rNZujnCs99NbIKJZPD9hXYmiijxH6wrCQm97GZMyQ%3D%3D [accessed 1 March 2017].
[120] BT is not required to report volumes, revenues or costs for these services, but did provide volumes and revenues for 2014/15 and 2015/16 in response to our 2nd joint WLA WBA s.135 to BT (dated 18 August 2016), templates "Q25-GEA actuals" and "Q27-NGA Other Actuals".
[121] We have also considered a flat cap in real terms, i.e. CPI-0%. However, in view of the low inflation in the recent past and the fact that BT has not changed the charges for GEA Cablelink since the service was launched, we think that a flat nominal cap is more appropriate.

the Cablelink services they purchase. We are unable to set a cost-based charge control for this service as we do not hold specific cost information for it.[122] For the same reasons we have considered in relation to GEA Cablelink, we also propose a flat nominal cap for VLAN moves applied to GEA Cablelink. [123]

3.118 We propose the following flat nominal caps:

- 1 Gbit/s Cablelink (connection charge) at £2,000;
- 10 Gbit/s Cablelink (connection charge) at £10,000; and
- VLAN moves applied to Cablelink at £15.

MPF and GEA Cancel/Amend/Modify

3.119 In the 2014 FAMR Statement, we set out a charge control for MPF Cancel, Amend and Modify services in the "Other LLU ancillaries" basket.[124] However, we allowed BT to retain pricing flexibility on the GEA equivalent services, consistent with our wider policy of allowing pricing flexibility on VULA services.[125]

Analysis and proposals

3.120 Currently, BT sets the following charges for Cancel, Amend and Modify services:[126]

- Cancellation of MPF orders for Provide, Migration, Working Line Takeover, Modification or Amend at £10.28;
- Amend orders. Allowable change to MPF Order at £10.28;
- GEA Cancel/Amend/Modify - CRD Amend, order notes amend, order cancellation, Care Level, etc. at £11.25; and
- GEA Cancel/Amend/Modify - Regrading of existing upstream or downstream speed, both at point of sale and in-life etc. at £11.25.

3.121 When a telecoms provider wishes to cancel, amend or modify an MPF or GEA order it is likely that it will have to choose one of these four services.[127] In 2014/15 the total revenues were: £[✂][128] for "Cancellation of MPF orders for Provide, Migration,

[122] BT is not required to report volumes, revenues or costs for this service, but did provide volumes and revenues for 2014/15 and 2015/16 in response to our 2nd joint WLA WBA s.135 to BT (dated 18 August 2016), templates "Q25-GEA actuals" and "Q27-NGA Other Actuals".
[123] We have also considered a flat cap in real terms, i.e. CPI-0%. However, in view of the low inflation in the recent past and the fact that BT has not changed the charges for VLAN moves applied to GEA Cablelink since the service was launched, we think that a flat nominal cap is more appropriate.
[124] 2014 FAMR Statement Volume 2, paragraph 4.155.
[125] 2014 FAMR Statement Volume 1, paragraph 1.35.
[126] BT's price list, https://www.openreach.co.uk/orpg/home/products/pricing/loadPricing.do [accessed 1 March 2017].
[127] However, we note that in the case of "GEA Cancel/Amend/Modify - Regrading of existing upstream or downstream speed, both at point of sale and in-life etc.", it is possible that the "GEA bandwidth modify" service may be a viable alternative option to regrade the existing upstream or downstream speed.
[128] BT's 2015/16 WLA Compliance Statement.

Working Line Takeover, Modification or Amend"; £[✂][129] for "Amend orders. Allowable change to MPF Order"; and £[✂][130] for the two GEA Cancel/Amend/Modify services combined together.

3.122 Given the lack of alternatives to these services, we think that there is a risk of BT setting its charges excessively above cost, which ultimately may adversely affect customers.

3.123 In order to address our concern, we propose to:

- charge control both "Cancellation of MPF orders for Provide, Migration, Working Line Takeover, Modification or Amend" and "Amend orders. Allowable change to MPF Order" in the "Other MPF ancillaries basket" at FAC;[131] and
- require that the charges for each of the four services identified in paragraph 3.120 above are aligned (among themselves). This means that whilst the GEA service variants are not in the relevant charge control basket they will be protected by the charge control. We think this is appropriate because these four services are similar in nature. In particular, they consist of a software activity to cancel, amend or modify an existing order and are likely to have similar costs.

Optimisation and Repair services

3.124 Time Related Charges (TRCs) refer to engineering services where the work is not covered by BT's terms of service.[132] They are charged for MPF and GEA products on a per-visit or per-hour basis for an engineer and can vary depending on when the work takes place e.g. inside or outside normal business hours.[133] These charges largely relate to the cost of an engineer's time (including direct and indirect costs). BT reported total revenue of £37.6m for TRCs in 2015/16.[134]

3.125 Special Fault Investigations (SFIs) are services requested by telecoms providers to further investigate faults on an MPF or SMPF service where the standard line test reports 'OK', i.e. no fault found. The service is sold in individual modules with investigative work carried out at various points between (and including) the exchange and customer premises/wiring.[135] We understand that the cost of SFI work is largely based on direct and indirect labour engineering time charged on an hourly incremental basis, and end-user or exchange visit costs where applicable.

[129] BT's 2015/16 WLA Compliance Statement.
[130] BT's response dated 21 September 2016 to the 2nd joint WLA WBA s.135 request to BT.
[131] See heading "Other MPF ancillaries basket" in this section.
[132] BT, *Fact sheet: Time Related Charges.* Available at: www.BT.co.uk/orpg/home/services/serviceservices/timerelatedcharges/timerelatedcharges/downloads/TRCs.pdf [accessed 23 March 2017].
[133] BT's price list https://www.openreach.co.uk/orpg/home/products/pricing/loadProductPriceDetails.do?data=pBzHTRfO4GXC12qz7DCzqUP54d5RrQ9TQD%2BRDuYwQUElMnGHsqdC0vzO163bJmh34D91D7M0q8u%2FIlSgtIFAKw%3D%3D [accessed 1 March 2017].
[134] BT's RFS 2015/16.
[135] The modules being: Base, Network, Frame, Internal wiring, Internal equipment, Coop, and Frame direct.

MPF Optimisation and Repair services

3.126 In the 2014 FAMR Statement we concluded that, while MPF TRCs and MPF SFIs may be contestable to some extent, there are a number of barriers to telecoms providers' use of third party engineers to provide such services. We therefore considered that some form of pricing regulation was necessary where they are in the scope of the network access requirement imposed in relation to LLU services. We imposed a control to bring charges into line with FAC. We did not think that LRIC would be appropriate because TRCs and SFIs are not as fundamental to customer switching as migration services.[136] BT reported total revenue of £32.9m for SFIs in 2015/16.[137]

Analysis and proposals

3.127 We have considered whether BT's TRCs (as applied to MPF and GEA) are likely to be constrained by potential competition. This depends on whether it would be realistic for non-BT engineers to undertake the work. In the case of repairs, BT will:

- not charge TRCs if the fault was found to be on BT's network and can only be repaired by an BT engineer. This is because the visit and repair are part of normal service delivery;
- charge TRCs if:
    - the fault is found to be not on BT's network (and could be repaired by a non-BT engineer);[138] or
    - the fault is on BT's network but the damage has been caused by the end customer (only a BT engineer can make the repair).

3.128 The higher the proportion of visits where a fault is found on BT's network, the less economic it would be to send a non-BT engineer.

3.129 It is difficult for telecoms providers to know in advance of an engineer's visit whether any charges would be applied or not. As telecoms providers do not know for certain whether TRCs will be charged, this tends to make it unlikely to be economic to send a non-BT engineer because of the risk that the fault could be repaired as part of BT's normal service delivery.

3.130 Telecoms providers can try to determine with the end customer whether the fault is likely to be on BT's network through diagnostic tests. However, even if no issue is found, there can still be faults on the BT network. For example, a line may pass the diagnostic check where there is an intermittent fault.

3.131 Furthermore, the evidence suggests that it is difficult for telecoms providers to identify the location of a fault with sufficient accuracy as the remote diagnostic tests and processes, while informative, do not categorically specify whether the fault is on or off BT's network. Similarly, while in-home checks with the customer can be useful, they may not always conclusively ascertain whether the work needed is on or off

[136] 2014 FAMR Statement Volume 1, paragraph 18.73.
[137] BT's RFS 2015/16.
[138] The fault may or may not be repaired by the BT engineer depending on whether prior authorisation has been given by the telecoms provider, but a charge will anyway be made for the visit.

BT's network. Moreover, we understand that line test errors can happen, which may undermine telecoms providers' confidence in their accuracy. This situation may change if the current efforts to make use of additional data available to telecoms providers for fault diagnostics come to fruition, but we are unable to project the outcomes of that work at this stage.[139]

3.132 In theory many of these services can be provided by any telecoms engineer. However, the practical difficulties of assessing whether a non-BT engineer could carry out the work means it is unlikely to be economic to use non-BT engineers and these services are not contestable.

3.133 We consider that the situation with SFIs is broadly similar to that of TRCs. Some of the work undertaken on SFIs can only be undertaken by BT (that is, work on BT's network and frame). Moreover, in advance of the visit to the customer's premises, telecoms providers do not know whether any work required will be on BT's network or beyond the NTE. We therefore consider that similar reasoning for TRCs is likely to apply to SFIs, and that BT's SFI charges are also unlikely to be constrained sufficiently by competition from other providers.

3.134 As a consequence, and in line with our conclusions in the 2014 FAMR Statement, we do not consider these services are sufficiently contestable. Therefore, there is a risk that BT could charge excessively high prices and telecoms providers would have little option but to pay. We believe that BT's ability to excessively price and distort competition should be constrained.

3.135 We propose to impose separate charge controls for MPF TRCs and SFIs and to require that any replacement service(s) for existing TRCs and SFIs remain within the scope of our charge controls.

3.136 We propose to apply the charge control to each TRC (as applied to MPF or GEA) and each SFI charge component separately. While BT could use pricing to distort downstream competition, TRC and SFI pricing does not impose unnecessary barriers to switching. As such, in line with the principles that we have set out, we consider that FAC is the appropriate cost standard. We propose to align SFI charges with the equivalent reported TRC costs.[140]

3.137 Some telecoms providers may argue that BT has an incentive to minimise its investment in the quality of the copper network to increase the volume of sales of SFI type activities, and therefore a LRIC standard may be more appropriate. However, we make proposals to address BT's incentives to invest in network quality in the 2017 QoS Consultation and further consider it unlikely that BT could manage the characteristics of its network to this level of precision.

GEA Optimisation and repair services

3.138 We made no proposals or decisions in respect of GEA TRCs or optimisation and repair services as part of the 2014 FAMR consistent with our wider policy of allowing BT pricing flexibility on VULA services.

[139] We consider this further in 2017 QoS Consultation, Section 4.
[140] See Annex 11 for further details on the derivation of the charge controls for TRCs and SFIs.

Analysis and proposals

3.139 The analysis that we have set out above for TRCs is directly applicable for TRCs in respect of GEA services and does not require repetition. Our proposal to apply a FAC based charge control to each TRC is directly applicable for TRCs in relation to GEA services.

3.140 BT also provides a number of other GEA optimisation and repair services, in particular:

- GEA in-tariff and premium repair – SML2, 3 and 4;
- Superfast Visit Assure;
- Fibre Broadband Boost;
- Superfast Recharge; and
- Remote Assure (multicast only).[141]

3.141 GEA in-tariff and premium repair – SML2, 3 and 4 are used if a customer has a problem with their SFBB service and the path appears not to be working. The standard SML2 offers a fix by the end of the next working day including Saturdays at no extra charge, while SML3 (at £37.20 per year) offers a fix more rapidly than SML2, and SML4 (at £48 per year) more rapidly than SML3.[142] Total revenues for GEA SML3 and 4 have [✂][143]

3.142 Superfast Visit Assure is used when an end customer has a problem with their SFBB and the standard GEA line test result is 'OK'. Like Fibre Broadband Boost and SFIs, the service aims to improve the speed and reliability of a customer's broadband. The engineer can work on: the customer's wiring/equipment; BT network (customer's premise); and BT external network. Superfast Visit Assure was priced at £155 from July 2011 to March 2013, it is currently priced at £165 but expected to decrease to £130 from April 2017.[144] Total revenue for Superfast Visit Assure [✂][145]

3.143 Fibre Broadband Boost is used when a customer has a problem with their SFBB and the standard GEA line test result is 'OK'. Similar to Superfast Visit Assure and Superfast Recharge, it aims to improve the speed and reliability of the customer's broadband. The engineer can work on: customer wiring/equipment; BT network

[141] BT's response to question 1 of the 25th s.135 to BT (dated 23 February 2017).
[142] BT's price list https://www.openreach.co.uk/orpg/home/products/pricing/loadProductPriceDetails.do?data=to6u3F12FmH4GL92i3NosR9iCKrrD%2FZpzK1a%2FvJOccNZ6rNZujnCs99NbIKJZPD9hXYmiijxH6wrCQm97GZMyQ%3D%3D [accessed 27 March 2017].
[143] BT's response dated 6 March 2016 to the 25th s.135 request to BT, question 1.d).
[144] BT's price list https://www.openreach.co.uk/orpg/home/products/pricing/loadProductPriceDetails.do?data=yzq%2FQaGYa3hVgsB2ZYfjHxzfISuq3px%2FWFtgATP2kPRZ6rNZujnCs99NbIKJZPD9hXYmiijxH6wr%0ACQm97GZMyQ%3D%3D [accessed 1 March 2017].
[145] BT's response dated 6 March 2016 to question 1d of the 25th BT s.135 request.

(customer's premise); BT external network; and/or frames. Fibre Broadband Boost is currently priced at £[✂].[146] Total revenue for Fibre Broadband Boost [✂].[147]

3.144 Superfast Recharge is used to improve the speed of a GEA-FTTC installation where a new customer's actual speed is less than predicted within 28 days of a self-install. BT engineers can work on: customer wiring/equipment; BT network (customer's premises); BT external network; and/or Frames.

3.145 Given the fact that Superfast Recharge was [✂][148] and absent robust cost information by which we might set a cost-based charge control, it seems to us that the general SMP remedies are likely to be the most appropriate form of regulation to this service. Remote Assure (multicast only) is used to remotely check, and if necessary repair, the configuration of the Multicast VLAN at each point in the network, and will check the flow of traffic to ensure that traffic is being presented correctly. Remote Assure is currently priced at £50.[149] Total revenue for Fibre Broadband Boost [✂].[150]

3.146 The context in which GEA optimisation and repair services might be used by telecoms providers is largely the same as for an MPF SFI or TRC (MPF or GEA): some of the work carried out on these services can only be undertaken by BT. Moreover, in advance of the visit to the customer's premises, telecoms providers do not know whether any work required will be on BT's network or beyond the NTE. As for MPF SFIs and TRCs, in practice, these services are not contestable and we therefore consider it necessary to constrain BT's ability to price excessively.

3.147 As we have explained above, services such as the GEA optimisation and repair services identified above do not impose unnecessary barriers to switching and as such a LRIC cost standard would not be appropriate. While a FAC based control might otherwise be appropriate in this case, given the lack of detailed cost information that would suggest charges should not be at their current levels, the uncertainty about future volume growth, and the pricing stability that we have observed, we believe a nominal flat rate caps would be more appropriate.[151]

3.148 We propose to apply flat nominal caps at the current charges to: Superfast Visit Assure at £130[152]; and Fibre Broadband Boost at £159, and require that any replacement of these service(s) are also within the scope of our proposed price regulation.[153] Moreover, we propose to require that all the remaining charges related to GEA optimisation and repair services to be subject to the general SMP remedies,

[146] BT's response dated 6 March 2016 to question 1c of the 25th BT s.135 request.
[147] BT's response dated 6 March 2016 to question 1d of the 25th BT s.135 request.
[148] BT's response dated 6 March 2016 to question 1d of the 25th BT s.135 request.
[149] BT's price list https://www.openreach.co.uk/orpg/home/products/pricing/loadProductPriceDetails.do?data=BGsObZmZkXxTeKZ%2B1TUSB%2FvP446MIFzyWzwkT4Sjy%2FhZ6rNZujnCs99NbIKJZPD9hXYmiijxH6wrCQm97GZMyQ%3D%3D [accessed 1 March 2017].
[150] BT's response dated 6 March 2016 to question 1d of the 25th BT s.135 request.
[151] We do not propose to charge control: GEA SML3 and 4 (as there is a competitive constraint from SML2's charge control); Superfast Recharge (these services were launched during 2015/16 and total revenue is relatively low, thus it is still unclear whether a charge control is required); and Remote Assure (as this is a service for multicast only and we are not proposing to charge control multicast).
[152] BT announced an update to the charge for Superfast Visit Assure to £130 in April 2017.
[153] This is intended to prevent BT from being able to game the proposed charge controls by introducing new optimisation and repair services.

i.e. price notification, no undue discrimination, fair and reasonable terms, conditions, and charges.

Weighting price changes and consideration of additional controls within baskets

3.149 A basket control limits the maximum weighted average increase in prices in any given year. The weighting we use is the amount of revenue earned by each service. When BT sets prices each year we need to consider how these revenue weights should be determined, e.g. whether they should be based on the previous year's revenues or a forecast of the current year revenue weighting.

3.150 In the 2014 FAMR Statement we considered three different approaches to set basket weights:

- **current year weighting**: the weights are set equal to the proportion of current year basket revenues accounted for by each service as a proportion of total current year revenues;
- **the "snapshot" approach**: similar to the prior year weighting approach, but we change the definition of prior year revenue so that it is calculated as a "snapshot" using actual volumes at a suitably recent point in time multiplied by average price during the 12 months prior to the start of the charge control year; and
- **prior year weighting**: basket weights are set equal to the proportions of basket revenues accruing to the relevant services in the year prior to the one in which the price change occurs.[154]

3.151 We proposed that prior year weights should be used for basket control compliance.[155]

3.152 Also, in the 2014 FAMR we introduced SMP Condition 7A.7 (g)[156] under which BT is required to automatically make repayments to its wholesale customers of any amounts overcharged by reference to the charge controls. The clause does not operate if BT over-complies with the controls.[157]

Our analysis and proposal

3.153 We propose to retain the SMP Condition provision introduced in the 2014 FAMR[158] under which BT is required to automatically make repayments to its wholesale customers of any amounts overcharged by reference to the charge controls. We consider that this is appropriate to ensure effective compliance with the charge controls. The SMP Condition does not operate if BT over-complies with the controls.[159]

3.154 Below we analyse the three different approaches to set basket weights as also considered in the 2014 FAMR Statement.

[154] 2014 FAMR. Volume 2 paragraphs 4.266-4.280.
[155] 2014 FAMR: Volume 2, paragraph 4.280.
[156] 2014 FAMR Volume 2, paragraph 4.274.
[157] 2014 FAMR Volume 2, paragraphs 4.292-4.298.
[158] 2014 FAMR Volume 2, paragraph 4.274.
[159] 2014 FAMR Volume 2, paragraphs 4.292-4.298.

Current year weights

3.155 We propose not to use the current year weights approach because it can involve risks of gaming, potential volatility in charges and administrative burden.

3.156 We consider that if BT sets charges based on forecasts of current year volumes it should be able to recover any over- or under-charging which results from divergence between forecast and actual volumes in subsequent periods. However, as a result, it could therefore have an incentive to overcharge in the short term and repay the "overcharge" in subsequent periods – and there may be a cash flow incentive to do so unless interest is due on any "overcharge". It is also possible that some telecoms providers could try to game the control and try to influence BT's pricing decisions by providing misleading forecasts. If telecoms providers were able to influence BT in this way, it could increase volatility in prices. In principle, an appropriately set interest rate would reduce or remove any incentive for BT to "overcharge" or for telecoms providers to try to influence BT's pricing to "undercharge". However, such a mechanism would add further complexity to the charge control.

3.157 An alternative way to mitigate the risk of this type of gaming would be for us to review BT's volume forecasts. However, we are not well placed to know the extent to which BT's forecasts are accurate. Furthermore, this would impose a significant administrative burden on us and telecoms providers as the necessary information would need to be gathered on an on-going basis to enable us to review the forecasts.

3.158 Using forecast current year volume weightings could lead to volatile movements in prices as charges are set, then later adjusted for over- and under-recovery against the controlling percentage for the cap. This is because demand for ancillary services may be volatile and forecast volumes are likely to vary from actual volumes. Changes in demand that are unforeseen by BT are likely to have a big impact on variation between outturn and forecast volumes and hence are likely to have a significant impact on whether the price changes meet the basket control.

3.159 The volatility in wholesale charges caused by the use of forecasts of current year volume weightings could ultimately be harmful to customers. It would create uncertainty for telecoms providers using inputs from BT and limit their ability to plan.

3.160 Also, we consider that the clause on BT to automatically make repayments to its wholesale customers of any amounts overcharged by reference to the charge controls may not fit well with current year weights. Note that the clause does not operate if BT over-complies with the controls. Thus, BT would be subject to uncertainty when forecasting the current year volumes, and subject to a risk of being unable to recover the allowed revenues (and hence potentially costs) of a basket in that period or subsequent ones.

Snapshot approach

3.161 We do not propose to use the snapshot approach[160] as we do not believe it would be appropriate for ancillary services where volumes can be volatile. If volumes are volatile the latest volume information is unlikely to be the most representative. In the

[160] The snapshot approach is useful if different services in the same basket have stable volume trends and volatility is small.

case of the MPF ancillaries there is a significant degree of revenue and, probably, volume volatility.[161]

Prior year weights and sub-caps

3.162 We propose to use prior year weights as this enables BT to plan its charges in a given year with confidence that it will meet the overall basket control.[162] The main disadvantage of a prior year weights approach is that it is vulnerable to a particular form of gaming. This gaming involves targeting price increases on services whose weights in the basket are growing over time, so that the prior year revenue weight understates the effect of the price increase on actual revenues. Partly to mitigate this disadvantage, we propose to use a sub-cap on each and every individual charge in a basket (see heading on "Sub-caps at CPI-X+7.5%" below).

3.163 We consider that the clause on BT to automatically make repayments to its wholesale customers of any amounts overcharged by reference to the charge controls fits well with prior year weights. This is because at the start of each control period BT will know (at least to a significant extent) the prior year volumes/revenues, and thus will not be subject to a risk of being unable to recover the allowed revenues (and hence potentially costs) of a basket in that period or subsequent ones.

3.164 Also, we considered:

i) prior year weights and removing pricing flexibility (either by setting additional controls on services within baskets or requiring all items to move in line with the basket control); and

ii) prior year weights and a tighter overall basket controls based on lower than our modelling cost estimates to take into account BT's potential extra revenues due to gaming.

3.165 However, approach (i) would remove one of the main benefits of basket controls, i.e. allowing BT to adjust charges to recover costs efficiently. We do not consider that this is an appropriate and proportionate approach to mitigate the risks inherent with prior year weights. Approach (ii) would be a complex[163] approach to setting the sub-caps which we consider would not be appropriate or proportionate. Moreover, approach (ii) would not prevent gaming though it could redistribute the benefits of it to (some) telecoms providers.

[161] We can illustrate this with three examples. Revenue from MPF tie pair modification (3 working day lead time re-termination) was £[✂] in 2013/14 and £[✂] in 2014/15. Revenue from MPF new provide standard was [✂] in 2013/14 and £[✂] in 2014/15. Revenue from MPF standard line test was £[✂] in 2013/14 and £[✂] in 2014/15. BT's 2015/16 WLA Compliance Statement.

[162] In practice BT must notify telecoms providers 90 days in advance for price increases, and 28 days in advance for price decreases to existing WLA network access inputs. Therefore, when setting prices at the start of the new control year BT relies on revenue data from the first nine months of the year and forecasts for the final three months. However, if forecast current year weights were used it would base prices on forecasts up to fifteen months in advance. See paragraph 4.33 of the March 2011 LLU WLR Consultation and page 179 of the March 2012 Statement Annexes. Also, we set out in paragraphs 10.306-10.308, Volume 1 of the 2014 FAMR Statement that BT will be required to give 28 days' notice for price changes to all WFAEL services, except WLR rental.

[163] This option would require accurate volume forecasts (on an individual service basis) and demand elasticity information, which may be gamed by both BT or telecoms providers in order to influence the basket controls.

3.166 We propose to continue the SMP Condition in which BT is required to automatically make repayments to its wholesale customers of any amounts overcharged by reference to the charge controls. The clause does not operate if BT over-complies with the controls.

3.167 We propose that prior year weights to be used for the basket controls.

Sub-caps at CPI-X+7.5%

3.168 In the 2014 FAMR Statement we decided to use sub-caps at CPI-X+7.5% on each charge within a basket.[164]

Our analysis and proposal

3.169 As discussed above, sub-caps mitigate the risks of gaming the basket control (in particular, when using prior year weights) while allowing BT some pricing flexibility as to its judgement of Ramsey pricing in baskets. Also, sub-caps provide some degree of protection to customers from the risk of large price increases (and excessive prices), as well as protect retail competition, by limiting BT's scope to distort it by concentrating price increases on services that are essentially consumed by non-BT telecoms providers.[165]

3.170 We propose to use sub-caps rather than inertia clauses.[166] First, we consider there is likely to be greater risk of BT pricing too high than too low in these markets. Second, given that overall basket controls are likely to be binding, a sub-cap on each charge prevents very rapid reductions in charges by limiting the ability to offset them with increases on other services within the basket.[167]

3.171 We consider that a sub-cap is easy to understand and set, and mitigates the risks of gaming whilst allowing some pricing flexibility.

3.172 We consider that a sub-cap on each charge should be less restrictive than the overall basket control. Given that the sub-caps are designed to apply to every service in the basket, a sub-cap as tight or tighter than the basket cap would defeat the objective of pricing flexibility within the basket (and may compromise Openreach's ability to recover costs given we calculate the basket controls to recover expected costs by the end of the control period).

3.173 Setting the appropriate level of sub-caps on individual charges requires the exercise of regulatory judgment to balance the benefits of allowing some flexibility to change charges against the risk of gaming. In the 2014 FAMR Statement, where we had basket controls, we set sub-caps for each individual charge within the basket at 7.5% above the overall basket control. We believe this level of sub-cap provides a reasonable balance between giving BT flexibility to set charges within the basket whilst also providing protection to telecoms providers purchasing each specific service. Therefore, we propose to take the same approach again.

[164] 2014 FAMR Statement, paragraph 4.291.
[165] This relates to our objectives set out in above, of protecting consumers against the risk of high prices, and protecting retail competition where necessary, based on access to BT's network.
[166] An inertia clause limits the maximum annual increase or decrease of a charge, whereas a sub-cap only limits the charge increase.
[167] BT's 2015/16 LLU WLR Compliance Statement showing that for most of the LLU baskets the controlling percentage is close to the weighted percentage price change (if not the same).

Consultation question

Question 3.1: Do you agree with each of our proposals in relation to the design of charge controls for BT's LLU and GEA services? Please provide reasons and evidence in support of your views.

Section 4

Charge control cost modelling

Introduction

4.1 This section provides an overview of the cost models we have constructed as part of our proposed approach to modelling the costs of MPF and GEA-FTTC services for the purposes of setting charge controls from April 2018 to March 2021. We set out high-level explanations of the top-down model we have designed to estimate the costs of MPF services, the bottom-up model we have designed to estimate the costs of GEA-FTTC services, and key modelling decisions that we are proposing to make (including decisions in relation to key modelling inputs).

4.2 This section outlines:

- our modelling approach – we use a top-down model to estimate the cost of LLU services and common costs and a bottom-up model to estimate the LRIC of BT's GEA services;
- the control module for the models and the relationship between the top-down and bottom-up models;
- a summary of our service volume forecasts;
- the design and inputs to the top-down model, including base year cost data from BT's 2015/16 Regulatory Financial Statements (RFS);
- the design and calibration of the bottom-up model;
- other inputs to the models, including the allocation of common costs, cumulo costs, and the weighted average cost of capital (WACC); and
- a summary of the cost model outputs for MPF and 40/10 GEA services.

4.3 More detailed information on each of the above can be found in Annexes 10 to 18, and in the models published alongside this consultation.[168]

Conceptual modelling approach

4.4 As set out in Section 2, to estimate costs for the charge controls, we propose to use an anchor pricing approach based on an ongoing copper access network with an FTTC overlay providing GEA services. There are a number of different ways that we can construct a cost model for estimating the cost of these services in order to set charge controls. Historically, when estimating costs for setting charge controls, we have built the following types of models:

- Top-down model – based on total network cost data (usually derived from accounting cost data such as BT's RFS). We forecast the costs forwards based on asset volume elasticities (AVEs) and cost volume elasticities (CVEs) applied

[168] https://www.ofcom.org.uk/consultations-and-statements/category-1/wholesale-local-access-market-review

to our forecast of component volumes. The costs are then allocated to services based on usage factors; or

- Bottom-up model[169] – based on an estimate of how much network equipment is required to deliver a projected level of volumes for a specific service cost driver. These network equipment volumes are then converted into costs based on bottom-up evidence of the capex and opex associated with each unit of equipment.

4.5 In selecting the appropriate modelling approach, we are required to exercise our judgement, based on our experience as the sector regulator for these services. In the 2014 LLU WLR model we used a top-down model based on BT's RFS data to estimate the cost of charge controlled copper access services. We preferred a top-down because:

- stakeholders were familiar with such RFS-based cost models;
- the data is based on audited RFS data; and
- we were able to disclose some data used by the model as part of the consultation process.

4.6 We are still of the view that a top-down model forms the best basis for estimating the cost of MPF services. We have an established model that can be used to estimate the cost of these services and our approach is well understood by stakeholders. BT has reported cost data on copper access service in the RFS for a number of years meaning we have some confidence in these data and the cost volume relationships that sit underneath them. We therefore propose to use BT's top-down cost data to estimate the cost of MPF services. We discuss the details of how we have built the top-down model in Annex 11.

4.7 We proposed, in our May 2016 WLA Consultation on fibre cost modelling, to model the incremental cost of providing GEA services using a bottom-up model based on a FTTC network using VDSL technology. We preferred a bottom-up model over a top-down model for estimating the cost of GEA services because:

- A bottom-up model allows a more accurate calculation of cost-volume relationships. Understanding these relationships in a top-down model can be difficult for new services and services that are seeing rapid volume changes.
- A bottom-up model is usually more transparent because it can be published without large scale redactions; and
- We believed a bottom-up model was more consistent with the 2013 EC Recommendation.[170]

4.8 We set out stakeholder responses to our May 2016 WLA Consultation on fibre cost modelling and our further analysis in Annex 12. For the reasons set out above, we

[169] When we build a bottom-up model we will usually calibrate it against top-down data meaning it is sometimes referred to as a hybrid model.
[170] Commission Recommendation of 11.9.2013 on consistent non-discrimination obligations and costing methodologies to promote competition and enhance the broadband investment environment (C(2013) 5761), 11 September 2013, http://ec.europa.eu/smart-regulation/impact/ia_carried_out/docs/ia_2013/c_2013_5761_en.pdf.

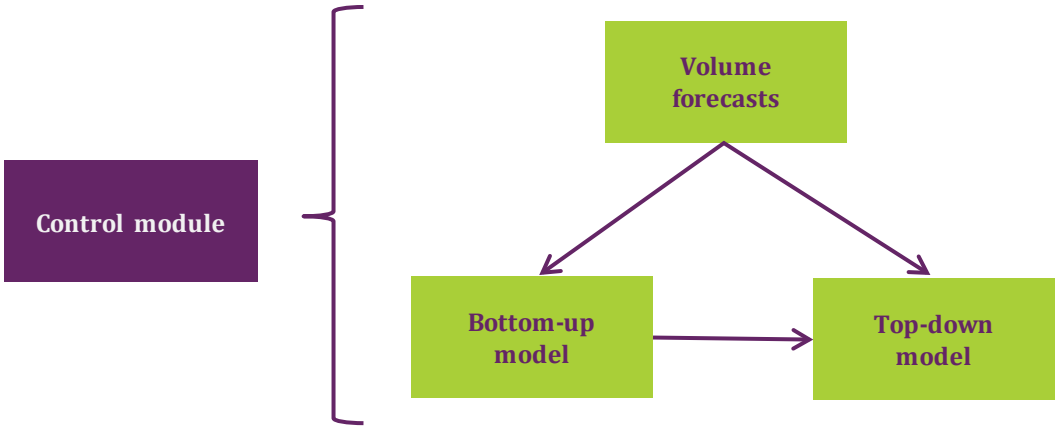
continue to believe that using a bottom-up model is the best option to estimate the cost of GEA services; therefore, we propose to use this approach. As discussed further below, in order to ensure the model captures all the incremental costs of providing GEA services using FTTC, we have calibrated our model using BT cost and network build data.

Control module and relationship between the models

4.9 The top-down and bottom-up models are run using a common control module which contains inputs to each of the models. The control module allows these inputs to be varied, presents a summary of the results from the models, and allows the impact of varying the inputs to be readily observed. The control module also contains a number of pre-set scenarios to create low and high unit cost estimates for services. These serve to produce the ranges of cost estimates for consultation.

4.10 A high-level relationship between the control module; the bottom-up and top-down models; and volume forecasts is shown in Figure 4.1 below. Volume forecasts are calculated for each service and the relevant forecasts are fed into the bottom-up and top-down models.

Figure 4.1: High level relationship between the models



Source: Ofcom.

4.11 As explained in Section 2, we use the bottom-up model to calculate the costs of GEA services on a LRIC basis.[171] We use these GEA LRIC costs estimates as inputs to the top-down model. The top-down model calculates:

- the total aggregate CCA FAC for the WLA and WFAEL markets;
- the unit CCA FAC for some MPF services;[172]
- the unit LRIC for some MPF services;[173]

[171] The services within the scope of the bottom-up model are GEA rentals, GEA customer site installations, GEA PCP Only Install, and GEA other (Start of Stopped lines, bandwidth changes and CP to CP Migrations).
[172] MPF New Provide Services, Hard Ceases (including SMPF Hard Ceases), Co-mingling New Provide and Rental Services, Tie Cables, and Other LLU Ancillary Services.
[173] MPF Single and Bulk Migrations, as well as MPF Rentals (for re-allocating common costs across rental services).

- the allocations of common costs across MPF rentals and GEA rentals; and
- 'X' values for the charge control.

Service volume forecasts

4.12 As shown in Figure 4.1 above, service volume forecasts are used by the bottom-up and top-down models to estimate service costs. Our forecasts, as detailed in Annex 10, are summarised in Figure 4.2 below.

Table 4.2: Summary table of WLA and WFAEL volume forecasts

	2015/16 Actuals		2020/21 Forecasts	
	Number of lines (millions)	Share of all Openreach lines	Number of lines (millions)	Share of all Openreach lines
Openreach WLR lines (without SMPF or GEA)[174]	[✂]	[✂]	2.9	12%
SMPF (total)	[✂]	[✂]	3.2	13%
MPF (without GEA)	[✂]	[✂]	4.3	17%
GEA-FTTC[175]	[✂]	[✂]	14.1	58%
Total Openreach lines	**25.1**		**24.5**	

Source: Volumes model (Ofcom 2017) using Ofcom forecasts based on BT actuals with adjustments for Project Lightning and PIA.

4.13 We propose to model service volumes using the following steps, as detailed in Annex 10:

i) **Forecasting the number of fixed line UK households**: the volumes model includes forecasts for the number of UK businesses and households, after excluding mobile-only households, up until 2028/29.

ii) **Forecasting the number of Openreach lines**: we then forecast the number of voice lines per business site and per residential household, and then multiply this by the business site and fixed line household forecasts to estimate total Openreach lines. We have also included adjustments which account for the impact of the PIA remedy[176] and Project Lightning[177], where we consider that these developments will mean that historic trends may not be representative of future trends.

iii) **Forecasting individual rental volumes**: when forecasting Openreach lines, we use assumptions of the change in overall broadband take-up, SFBB take-up, and the proportion of Openreach lines consumed by BT; we then estimate how the forecasted Openreach lines are split between MPF, WLR, SMPF and GEA. and

[174] We note that this includes both residential and business lines that use WLR but not a subsequent SMPF or GEA line.
[175] Note that this includes both GEA-FTTC and GEA FTTP service volumes.
[176] The Physical Infrastructure Access (PIA) remedy enables providers to deploy fibre in the access network using BT's ducts and poles; PIA is discussed further in this consultation, Volume 1, Section 4.
[177] Virgin Media's most recent large scale investment programme; Project Lightning is discussed further in Annex 10.

iv) **Forecasting connections and ancillary services**: following our forecasted rental volumes, we forecast the volume of connections and ancillary services, e.g. for migrations.

Top-down model

4.14 As we explain further in Annex 11, the top-down model calculations consist of the following six key steps:

i) take service volumes over the modelling period from the volumes model;

ii) convert service volumes to network cost component volumes using our service usage factors;

iii) calculate forecasts of capex and opex for each network component using estimated input price changes, efficiency forecasts and by applying the AVEs and CVEs to network component volumes;

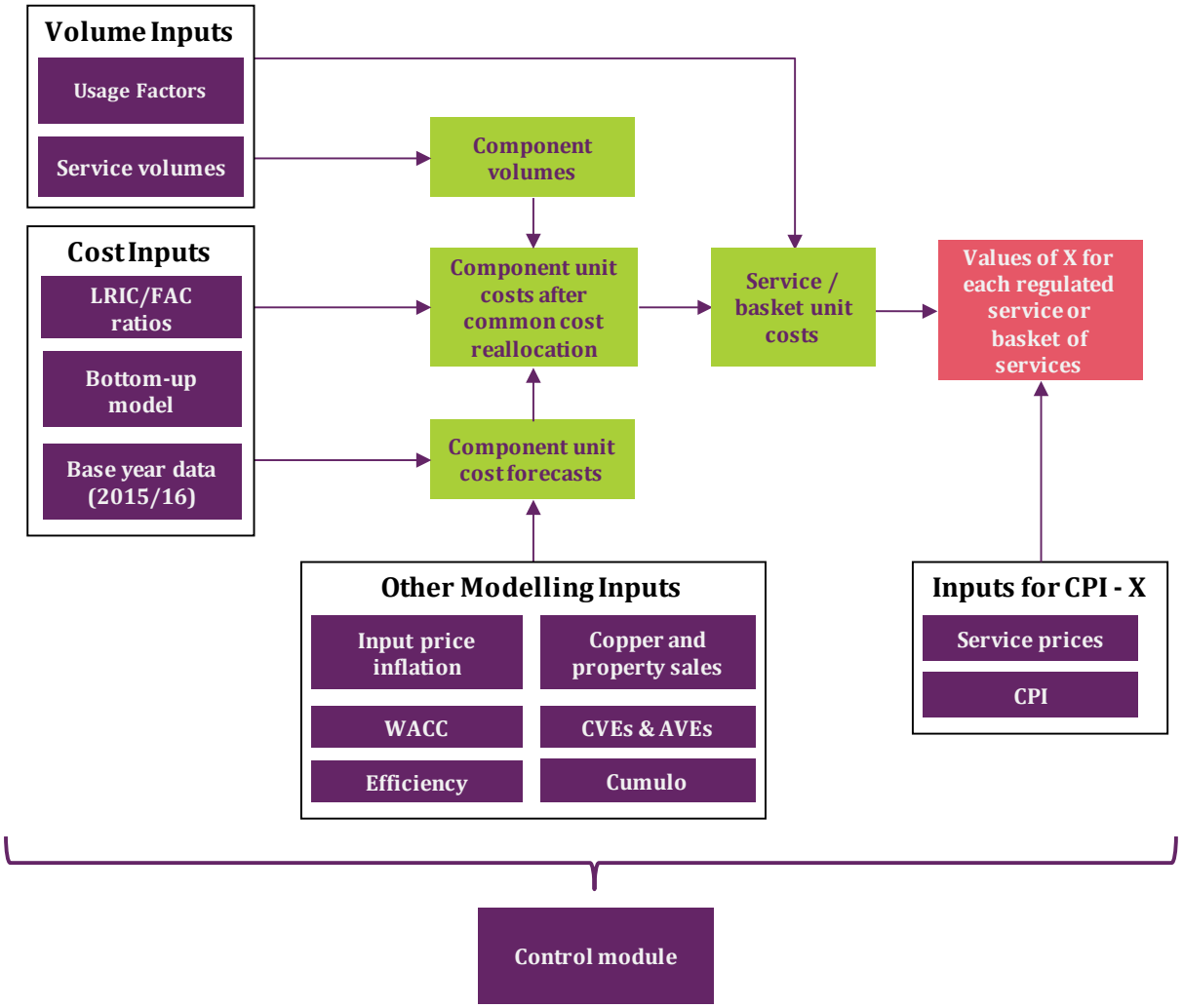
iv) calculate future service costs based on the amount that services use specific network components (i.e. by using our service usage factors);

v) allocate common costs to reflect incremental cost differences, as well as to reflect any policy decisions, e.g. the use of EPMU to allocate common costs across copper and fibre services; and

vi) calculate the X-values to be used in the CPI-X controls for each service or basket of services, as appropriate.

4.15 The high-level structure of the top-down model and associated inputs are shown in Figure 4.3 below.

Figure 4.3: Structure of the top-down model



Source: Ofcom.

Base year as a key input to the top-down model

4.16 A key input to the top-down model is the base year cost data from which future costs can be forecast. For the top-down model we have used BT's 2015/16 RFS as the source of capex and opex data in the base year. This is the most recent audited information available to us and hence the best available information to forecast BT's relevant costs over the charge control period.

4.17 Before using the base year data in the top-down model we propose adjustments to the 2015/16 costs considered necessary to ensure that base year costs represent the forward-looking cost of an ongoing network. We also aim to remain consistent with the principle of allowing BT the opportunity to recover its efficiently incurred costs. As we explain in Annex 11, we propose to:

- adjust for an error in the data (which we have discussed with BT) relating to MPF services;
- remove cumulo costs (which are modelled separately, as discussed further below);

- smooth 'one-off' restructuring costs and property rationalisation provision costs;
- remove costs and income associated with the BDUK subsidised services;
- adjust for a new MPF SML launched by BT;
- remove costs associated with service level guarantees (SLGs) on the basis that we are modelling SLGs separately;
- set capex and disposals equal to depreciation, so they reflect a network in a 'steady state'; and
- increase the net replacement cost of some assets where the accounting value of the asset has fallen below the economic value of the asset.

Summary of other inputs

4.18 Other inputs specific to the top-down model are:

- **Pay and non-pay inflation**: the details of our approach to both input price inflation and asset price inflation, below, are set out in Annex 15. We propose to adopt an average annual non-pay inflation assumption for our cost modelling between 2.0% and 3.0%, with a base case of 2.4%. We considered energy costs, accommodation costs (rent and rates) and other accommodation costs when setting a non-pay inflation assumption. We propose to adopt a pay cost inflation rate between 2.5% and 3.5%. We use a base case of 3.1% as the pay cost inflation rate per annum for our forecasts.
- **Asset price inflation:** we propose to adopt asset price change assumptions such that duct and copper assets are valued consistently with how they are revalued for CCA purposes in BT's RFS and all other asset prices are assumed to stay constant in nominal terms.[178]
- **AVEs and CVEs**: asset volume elasticities (AVEs) and cost volume elasticities (CVEs) are used to determine how component costs change when component volumes change.[179] We calculate our own AVE and CVE estimates based on BT's LRIC model output; specifically, these estimates are based on BT's information on the LRIC to FAC ratio for each component. A detailed explanation is provided in Annex 15.
- **Efficiency**: we forecast that BT will achieve cost savings over the charge control period. For opex, we propose an efficiency assumption of 5.5% within a range of 3.5-6.5%. For capex, we propose an efficiency of 3% with a range of 1-5%. The details of our approach can be found in Annex 15.
- **Sales of copper**: as discussed in Section 2 and Annex 18, BT generates revenue from sales of copper (and other material) no longer required in the network. We forecast that this revenue will be considerable in the future and so

[178] This is consistent with our approach in the 2014 FAMR Statement and the 2016 BCMR Statement.
[179] AVEs and CVEs typically have a value of less than 1, meaning a 1% increase in volumes cause a smaller than 1% increase in total costs. A CVE less than 1 implies the presence of economies of scope and a CVE greater than 1 implies the presence of diseconomies of scale.

we offset the revenue against costs across all copper access lines in our top-down model.

- **Sales of property**: Profits and losses arise when BT sells property that it considers surplus to requirements. We propose no adjustments to the base-year model for sales of property, but propose that BT should include sales of property in its RFS so that we can monitor costs. We also propose that BT must notify any changes to the attribution of these sales. Our approach is covered in detail in Annex 18.

Bottom-up model

4.19 As discussed above, we use a bottom-up model to calculate the LRIC of GEA services. As we proposed in the May 2016 WLA Consultation on fibre cost modelling, we model FTTC costs using VDSL technology as an ongoing overlay to an existing copper network.[180] We propose that the modelling period runs from 2007/08 (when FTTC roll-out is assumed to have begun) and forecasts until 2028/29.

4.20 In the bottom-up model, there are two potential approaches:

- a scorched earth approach which models a completely hypothetical fibre access network with the most efficient (lowest cost) design and topology; or
- a scorched node approach which uses the deployment of existing infrastructure as a starting point for any modelling exercise.

4.21 In our May 2016 WLA Consultation on fibre cost modelling, we proposed to use a scorched node approach and most of the respondents agreed. The alternative approach may omit migration costs and would limit our ability to use information from BT's actual FTTC deployment to populate and calibrate the model. The scorched node approach grounds the bottom-up model in reality.

4.22 In order to reflect competitive market outcomes, we have excluded areas where FTTC deployment has been subsidised (in part or in whole). We believe that excluding the costs, volumes and revenues associated with subsidised rollout from our modelling is likely to best mirror the costs of an efficient commercial network operator in the least complex manner.

4.23 At a high level, the bottom-up model performs the following five key calculations:

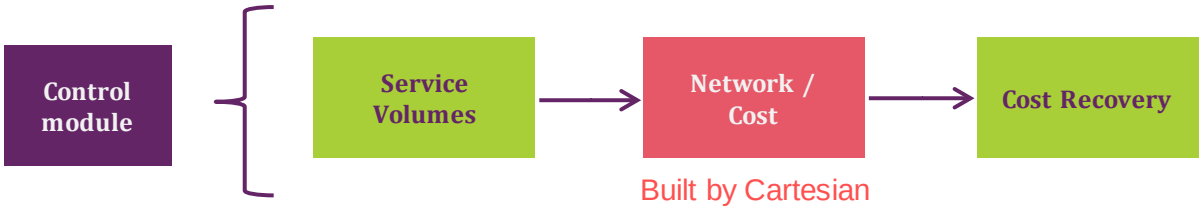
- takes service volumes over the modelling period from the volumes model;
- uses network engineering algorithms to dimension a network capable of meeting service demand;
- calculates the capital and operating cost of the assets in the dimensioned network;
- spreads the costs of the network over time using CCA depreciation; and

[180] Ofcom, May 2016. *Wholesale Local Access Market Review - Consultation on possible approaches to fibre cost modelling* https://www.ofcom.org.uk/__data/assets/pdf_file/0026/82664/Wholesale-Local-Access-Market-Review.pdf.

- recovers the cost of the network by allocating the costs of each network element to services using the routing factors used to dimension the network.

4.24 The structure of the bottom-up model is shown in Figure 4.4 below.

Figure: 4.4 Structure of the bottom-up model



Source: Ofcom

4.25 Further details of our approach and analysis considering responses to the May 2016 WLA Consultation on fibre cost modelling can be found in Annex 12. A separate report by Cartesian detailing the construction of the Network and Cost module of the bottom-up model can be found in Annex 20.

Calibration of the bottom-up model

4.26 We have calibrated the bottom-up model to ensure that the intermediate and final outputs are reasonably in line with real world network deployment and costs. We have done so by comparing our model outputs against asset count and cost information from a range of BT sources. As a result of this calibration, we have made some adjustments to our model inputs and network design parameters where appropriate.

4.27 As we explain further in Annex 13 we have performed a point calibration exercise, meaning that we have verified the outputs of the bottom-up model for a single year, in this case 2015/16. This means that while the bottom-up model determines the shape of the LRIC cost curve over time, the calibration exercise establishes whether this cost curve is at the right level.

4.28 We have also compared the final outputs of the bottom-up model against the charges set in a range of other European countries as a further cross-check to our bottom-up calculations. We have not made any adjustments to our calculation as a result of this cross-check.

4.29 The implementation of our model calibration can be summarised as follows:

- we calibrated the number of network elements dimensioned by the bottom-up model against BT's asset count information;[181]
- we calibrated the model against a range of BT cost metrics (GRC[182], NRC[183], opex, total CCA costs); and

[181] As detailed in Annex 12.
[182] Gross Replacement Cost (GRC).
[183] Net Replacement Cost (NRC).

- we compared the unit costs after common cost allocation against the fibre charges set by other European national regulatory authorities (NRAs).[184]

Other inputs to top-down and bottom-up models

Cumulo costs

4.30 Cumulo rates are the non-domestic (business) rates that BT pays on the rateable assets (e.g. duct, fibre, copper, exchange buildings) within its UK network.[185] BT's total non-domestic rates bill will increase significantly over the charge control period due to the 2017 revaluation by the rating authorities. A transition scheme is in place: cumulo rates will gradually increase to their new level over a period that extends beyond the end of our proposed charge control period.

4.31 We have forecast BT's cumulo costs, including the impacts of increasing numbers of GEA and MPF lines over the charge control period. We have then calculated attributions of these costs to WLA and WFAEL services to allow BT to recover a proportion of its cumulo rates bill for the relevant products in the charge control period.

4.32 Our proposed method for attributing cumulo to services is very similar to the current method BT uses. The steps are:

i) estimate the cumulo costs attributable to GEA and non-GEA services in each year;[186]

ii) attribute all GEA cumulo costs to GEA rental services. We divide these costs by GEA rental volumes to produce a GEA cumulo cost per annum in each year out to 2021/22. It is these values that are input to the bottom-up model; and

iii) attribute all non-GEA cumulo costs across non-GEA network components using a profit weighted net replacement cost (PWNRC) approach. To do this we generate forecasts for the non-GEA NRCs of rateable assets for each network component in each year. We attribute those cumulo costs to network components using the same routing factors that are applied in our main top-down model.

4.33 Annex 17 details how we have forecasted and attributed cumulo costs.

[184] We performed this only as a cross check owing to the lack of comparability of network deployments costs across countries.
[185] BT's cumulo costs are likely to rise significantly from 2017/18 onwards. That is because in September 2016 the valuation authorities in England, Wales and Scotland published draft assessments for all ratepayers that are due to come into force from 1 April 2017. We forecast this will increase BT's cumulo rates fourfold to £413m in 2020/21. Much of this cost falls within WLA markets and is relevant for our price control. We expect BT to seek to negotiate lower rates with the relevant valuation authorities, or to appeal. If BT negotiates a lower settlement after we publish our draft Statement, we will consider whether any action is required. If BT appeals the assessments, the conclusion of that appeal will likely be towards the end of our market review period in 2021 or beyond.
[186] We calculate the rateable value (RV) attributable to GEA services in each year by multiplying our forecasts of GEA rental volumes by £18 (our estimate of the per line RV based on a historical value used by the VOA – see Annex 17). This allows us to calculate a share of the total RV attributable to GEA services in each year which we then multiply by our forecasts of BT's total cumulo costs. This produces the cumulo costs attributable to GEA services and hence those attributable to non GEA services.

Cost of capital

4.34 When setting a charge control, we estimate the weighted average cost of capital (WACC) on a forward-looking basis in order to calculate the allowed return Openreach receives for holding capital in the form of its assets.

4.35 The models for the charge controls are based on projections of nominal costs without explicit modelling of tax, therefore we require a forecast of the pre-tax nominal WACC.

4.36 For this consultation, we propose to apply:

- an Openreach copper access pre-tax nominal WACC of 8.0% in 2020/21 and 8.1% in all other years for WLA copper access services (previously 8.6% in the 2014 FAMR Statement); and
- an 'other UK telecoms' pre-tax nominal WACC of 9.4% in 2020/21 for GEA services (previously other UK Telecoms was calculated as 9.8% in the 2016 BCMR Statement).[187]

4.37 Full details of our proposals on WACC calculation can be found in Annex 16.

Common cost allocation

4.38 We allocate costs that are common to copper and SFBB services within the top-down model. Common costs are costs that are shared between WLR, MPF and GEA services which cannot be attributed directly to these services. Therefore, when setting regulated prices we consider which approach to the allocation of common costs best meets our objectives. Section 2 sets out our rationale for allocating these costs:

- across copper and fibre services;
- across copper services; and
- across fibre services.

4.39 In Annex 11, we set out how we have implemented the proposed allocation of common costs, consistent with the rationale set out in Section 2. We also set out how we calculate common costs as the difference between BT's FAC and LRIC.

4.40 We propose to set the charge control caps for some services using their forecasted LRIC rather than forecasted FAC. The difference between LRIC and FAC for these services is included within the common costs that we re-allocate to other services, as detailed in Section 2. We have separately forecasted the common costs currently allocated to GEA services to ensure consistency with the bottom-up model's GEA LRIC.

[187] We propose to apply a WACC for the glidepath period that is 0.1% greater than the two WACC values listed here for Openreach and 'other UK telecoms'. This is detailed in Annex 16.

Results

4.41 A summary of our service unit cost and CPI-X formula X results (including our low, high and central estimates) for LLU services are shown in Table 4.5 below. The results in this section include the impacts of our glidepath, as detailed in Section 2.

Table 4.5: Base case LLU service results (range)

Basket/service	Charges at 31 March 2017 (£)	Charge control for 2018/19	Charge control for 2019/20	Charge control for 2020/21
MPF Rental (annual)	85.29	£83.50 (£80.0 - £88.2)	CPI-3.5% (-5.6% to -0.7%)	CPI-2.4% (-3.6% to -0.5%)
MPF Single Migration	30.26	£23.89 (£22.9 - £25.5)	CPI-13.6% (-15.5% to -10.7%)	CPI-5.2% (-6.9% to -2.7%)
MPF Bulk Migration	20.97	£14.92 (£14.3 - £16.0)	CPI-18.1% (-19.9% to -15.2%)	CPI-4.7% (-6.3% to -2.1%)
MPF New Provides basket	various	CPI-27.5% (-30.7% to -22.5%)	CPI-15.9% (-17.7% to -13.1%)	CPI-5.3% (-7% to -2.8%)
Hard Ceases basket	various	CPI-27.6% (-30.8% to -22.3%)	CPI-15.9% (-17.8% to -12.9%)	CPI-4.7% (-6.3% to -2.1%)
SFIs	various	various	CPI-8.7% (-9.9% to -6.8%)	CPI-1.4% (-2.1% to -0.3%)
TRCs	various	various	CPI-8.7% (-9.9% to -6.8%)	CPI-1.4% (-2.1% to -0.3%)
Other MPF ancillaries basket	various	CPI-55.9% (-57.9% to -53.1%)	CPI-34.2% (-35.7% to -32.2%)	CPI-6.0% (-7.7% to -3.5%)
LLU tie cables basket	various	CPI-2.0% (-4.4% to +0.8%)	CPI-2.2% (-3.4% to -0.8%)	CPI-3.6% (-4.2% to -2.8%)
LLU Co-mingling New Provides and Rentals basket[188]	various	CPI+54.6% (27.8% to 65.5%)	CPI+22.9% (11.7% to 27.2%)	CPI-5.3% (-5.3% to -2.9%)

[188] We note that the relatively large positive X for this basket is due a current misalignment of revenues and costs. We find that revenues have substantially fallen between 2013/14 and 2014/15, whilst costs have remained broadly the same. Therefore, we have investigated further and found that [✂]. We have assessed the impact of [✂] in the co-mingling new provides and rentals basket. This adjustment is used to create our low scenario for the consultation range.

Source: Output from our control module.

4.42 The corresponding results for GEA services are shown below.

Table 4.6: Base case GEA service results (range)

Basket/service	Charges at 31 March 2017 (£)	Charge control for 2018/19	Charge control for 2019/20	Charge control for 2020/21
GEA 40/10 Rental (annual)	88.80	£66.28 (£54.5 - £78.1)	CPI-16.1% (-24.1% to -8.7%)	CPI-9.4% (-11.0% to -6.1%)
PCP Only Install	49.00	£43.47 (£42.4 - £44.7)	CPI-8.3% (-9.5% to -6.9%)	CPI+1.3% (0.4% to 2.2%)
Start of Stopped line	32.52	£6.47 (£6.4 - £6.6)	CPI-57.9% (-58.2% to -57.5%)	CPI+1.1% (0.5% to 1.7%)
GEA CP to CP Migration	11.00	£4.50 (£4.4 - £4.6)	CPI-38.5% (-39.0% to -38.0%)	CPI+1.1% (0.5% to 1.7%)
GEA Bandwidth modify – to 40/10	11.25	£8.02 (£7.9 - £8.2)	CPI-18.0% (-18.8% to -17.1%)	CPI-2.8% (-3.3% to -2.3%)

Source: Output from our control module.

4.43 The resulting unit costs for MPF and GEA rentals can be seen in Figure 4.7 below.

Figure 4.7: MPF SML1 and GEA 40/10 annual rental charges for 2020/21 (£, nominal)

Source: Output from our control module.

4.44 Therefore, we propose in this consultation to set an MPF annual rental charge between £75.95 and £90.75, and a GEA annual charge between £38.65 and £69.90 for 2020/21.

4.45 Annex 14 presents our full set of base case results for the forecasted unit costs of MPF and GEA rentals. We also discuss the sensitivity of our models and illustrate the model outputs under a range of low cost and high cost cases.

Consultation questions

Question 4.1 Do you agree with our proposed conceptual modelling approach? Please provide reasons and evidence to support your answer.

Question 4.2: Do you agree with our proposed approach to forecasting service volumes? Please provide reasons and evidence to support your answer.

Question 4.3: Do you agree with our proposed top-down cost modelling for MPF services? Please provide reasons and evidence to support your answer

Question 4.4: Do you agree with our proposed bottom-up cost modelling for GEA services? Please provide reasons and evidence to support your answer.

Question 4.5: Do you agree with our proposed approach to calibrating the bottom-up model? Please provide reasons and evidence to support your answer.

Question 4.6: Do you agree with our proposed approach to estimating input price inflation? If not, what alternatives would you propose and why? Please provide reasons and evidence to support your answer.

Question 4.7: Do you agree with our proposed approach to estimating AVEs and CVEs? If not, what alternatives would you propose and why? Please provide reasons and evidence to support your answer.

Question 4.8: Do you agree with our proposed approach to setting efficiency target? If not, what alternatives would you propose and why? Please provide reasons and evidence to support your answer.

Question 4.9: Do you agree with our proposed approach to forecasting and attributing BT's cumulo costs? Please provide reasons and evidence to support your answer.

Question 4.10: Do you agree with our proposed approach to the treatment of future profit and losses from the sales of copper? Please provide reasons and evidence to support your answer.

Question 4.11: Do you agree with our proposed approach to the treatment of future profit and losses from the sales of property? Please provide reasons and evidence to support your answer.

Section 5

Charge control implementation

5.1 In this section, we explain the structure of the proposed charge controls described in sections 2, 3, and 4, and how the proposed conditions would work in practice. In particular, we discuss:

- how the proposed charge controls, would work alongside other regulation;
- how we would calculate whether BT was complying with the charge ceilings created by the CPI-X controls, including;
  - how the Percentage Change is calculated for each service;
  - the rules that we propose to determine BT's compliance with charge controls;
  - how we will determine the overall change in charges for each service or group of services;
  - the information we would require from BT to enable us to monitor compliance with the charge controls; and
- how the conditions allow for corrections where there has been over- or under-recovery.

5.2 We also explain why we consider that the draft legal instruments set out at Annex 22 of this consultation satisfy the legal tests set out in the Act in so far as they relate to our proposed charge controls and why we consider that, in making the proposals set out in this consultation we have complied with our applicable duties. Below we also explain how we take due account of all applicable recommendations issued by the European Commission under Article 19(1) of the Framework Directive and BEREC Common Positions.

Interaction with other remedies

5.3 In Volume 1, we set out our provisional conclusions that BT has SMP in the WLA market in the UK excluding the Hull Area and set out in detail our proposals to impose remedies through SMP conditions, including requiring BT to:

- provide network access on reasonable request (proposed Condition 1 and proposed direction);
- provide specific forms of network access (proposed Condition 2);
- follow process in relation to requests for new forms of network access (proposed Condition 3);
- not unduly discriminate in relation to matters connected with network access (proposed Condition 4);
- provide network access on an Equivalence of Inputs basis (proposed Condition 5);

- publish a reference offer (proposed Condition 8);
- notify charges and technical information (proposed Conditions 9 and 10);
- comply with all such quality of service requirements and publish quality of services KPIs as Ofcom may from time to time direct in relation to network access provided by the Dominant Provider pursuant to proposed conditions 1 and 2 (as applicable) (proposed Condition 11); and
- comply with rules on the regulatory financial reporting (Condition 12).

5.4 The charge controls that we propose as Conditions 7A, 7B and 7C are, alongside the SMP services conditions listed above, designed to address the competition concerns arising in the WLA market in which we have provisionally found that BT has SMP.

Proposed conditions

5.5 The proposed SMP service conditions 7A (for MPF services and some SMPF services), 7B (for charges for VULA services, and 7C (for charges straddling both MPF and VULA services, for example TRCs) as set out in Annex 23, have three key effects. They will:

- set charge controls from 1 April 2018 to 31 March 2021 for the services specified;
- ensure that average charges for MPF and GEA services subject to CPI-X charge controls do not change by more than the value of the charge control formula, as specified, and/or charges do not exceed the safeguard caps; and
- require BT to provide information annually to Ofcom to enable compliance monitoring.

Proposed values of X

5.6 As set out in Section 3, we are proposing to set individual charge controls on a number of MPF and GEA services, and to continue to have five separate baskets for LLU ancillary services. In relation to both types of charge controls, we propose that the charge ceilings will be subject to the CPI-X formula except for the First Relevant Year[189] when the controls are set at a particular level for services subject to individual charge controls. In the next part of this section we outline how the percentage change is calculated for each service or basket.

5.7 The CPI-X formula sets the charge controls with regard to the rate of inflation, measured by the CPI. The ranges of 'X' proposed for each service or basket are set out in Section 4.

Formulae to show how the Percentage Change is calculated for each service

5.8 Conditions 7A.5, 7B.3 and 7C.3 set out the formula that we propose to use to determine the Percentage Change for single services. For the First Relevant Year, we propose that various products will be subject to specific charge ceilings rather

[189] "First Relevant Year" is defined in Annex 23 as the period beginning on 1 April 2018 and ending on 31 March 2019.

than having a Percentage Change applied. Those ceilings are set out at Conditions 7A.2, 7B.2 and 7C.2.

5.9 In relation to the baskets of services, the formula we propose in order to monitor the Percentage Change for the services each year is necessarily more complex, as it needs to take a revenue weighted average of the services contained within the baskets. As we explain in Section 3, we propose to monitor BT's compliance with the basket controls using a prior-year revenue weights approach. We have structured Condition 7 to give effect to these proposals. The relevant formula that we propose for calculating the percentage change of each of the baskets is set out in Condition 7A.4 in Annex 23.

5.10 We consider that BT should have the flexibility to make multiple price changes in respect of a particular service (subject to meeting its other regulatory obligations) while at the same time providing the necessary protection against the potential for gaming of prices within a basket. We therefore propose to carry over our approach from the 2014 FAMR Statement to:

- weight service charges to reflect the proportion of the year during which they were in effect; and
- evaluate charge changes for each service in relation to the weighted average charge that applied during the prior control year.

Sub-caps and other specific provisions

5.11 Conditions 7A, 7B and 7C also set out a number of proposed specific controls on particular LLU and VULA services.

5.12 We explain in Section 3 that we propose to set sub-caps for each of the following baskets of services: MPF New Provides; Hard Ceases; Co-Mingling New Provides and Rentals; Tie Cables; and Other MPF ancillaries.[190] For each of the baskets the relevant formula we are proposing for calculating the Percentage Change is set out in Condition 7A.4 and the sub-cap constraints in Condition 7A.6.

5.13 In Section 3 we explain that we propose to align the charges between some services due to their similar nature. We propose to align:

- some GEA services with the equivalent MPF services, namely cancel/amend/modify services (in Condition 7C.5) and align MPF Amend with MPF Cancellation (in Condition 7A.8);
- some MPF services with the equivalent SMPF services, namely SMPF Remove Jumper Order Singleton Charge and SMPF Remove Jumper Order Bulk Charge (in Condition 7A.8); and
- FVA + FTTP 40/10 Rental with FTTC 40/10 rental + MPF Rental (in Condition 7B.5).

5.14 This does not prevent the charges for the respective services from being increased or decreased, but requires BT to set the same charge for equivalent services.

[190] See our five-basket structure for relevant LLU services in Section 3, Table 3.1.

Rules used to determine compliance

Deficiency and excess provisions

5.15 Deficiency and excess provisions set out how any under- or over-recovery in a charge control should be dealt with.

5.16 These provisions have been included in current charge controls and we propose to use them for the individual services and baskets of services that we propose to be subject to charge controls as part of this review.[191] These provisions are set out in detail in Conditions 7A.6 for LLU (MPF and certain SMPF ancillary services), 7B.4 for VULA and in 7C.4 for MPF and VULA in the draft legal instruments in Annex 23. These provisions have two functions:

- where BT charges below the cap, they give the ability to use the deficiency created by setting charges below the charge control requirements within a given year towards the charge control compliance in the following year. Therefore, the deficiency avoids penalising BT for bringing forward a charge reduction or increasing charges less than permitted with the cap; and

- where BT charges in excess of the cap, it is required to make up the excess the following year by charging less than the cap would otherwise have allowed.

5.17 We believe that symmetrical provisions remain appropriate i.e. symmetrical with respect to whether BT charges below the cap or whether the control is exceeded. We therefore propose to continue using deficiency and excess provisions for our charge control proposals.

5.18 We also propose to continue to require BT to make repayments to other affected telecoms providers (as soon as is reasonably practicable), in the event that it charges in excess of the cap in any given year for any services or basket of services.

Information from BT

5.19 We propose that BT is required to supply information in order for us to monitor its compliance with the controls. Consistent with the obligations in place in the existing charge controls, BT would be required to provide this information annually to Ofcom, no later than three months after the end of the charge control year. This requirement is set out in Conditions 7A.10, 7B.7 and 7C.7 in Annex 23. We propose that BT is also required to publish non-confidential compliance schedules as set out in Volume 1 Section 10.

Legal tests

5.20 In Volume 1 of this consultation we set out our proposals to impose charge controls for certain LLU and VULA services. In this Volume 2, we have set how we propose to set the level of those charge control, including the detail of our proposed cost modelling.

5.21 In the following we set out why we consider that the specific form of the charge controls that we are proposing for LLU and VULA services meet the relevant tests;

[191] For example, in the 2014 FAMR Statement Volume 2, Annex 29, condition 7A.7 (c) and (d).

and how, in formulating the proposals set out in this consultation, we have complied with our relevant statutory duties. Given the degree of overlap in our reasoning, for the purpose of explaining why we consider the legal tests to be met, we have set out our position on the proposed charge controls for LLU services and the charge controls for VULA services together below.

5.22 To give regulatory effect to the proposals set out in this document we propose three SMP conditions under section 87(9) of the Act: Condition 7A (for MPF and some SMPF services), Condition 7B (for VULA) and Condition 7C (for charges straddling both MPF and VULA services). The text of these proposed conditions is set out in schedule 1 to the statutory notifications published under sections 48A of the Act in Annex 23.

5.23 We are satisfied that our proposals meet our duties and the legal tests set out in the Act. Our reasons are set out below.

Proposed Condition 7A, Condition 7B, and Condition 7C

5.24 The new proposed SMP conditions 7A, 7B and 7C require BT to ensure that its charges for the LLU and VULA rental services and associated ancillary services do not increase by more than CPI minus/plus a value of 'X' that varies according to each relevant basket and individually controlled service.

5.25 Our reasons for proposing this particular form of control and the values for X are set out in full in this consultation. We propose that the first year of the control for all charge controlled services will begin on 1 April 2018. We propose that the controls will last for three years, ending on 31 March 2021.

Our duties and policy objectives

5.26 We discuss our duties and objectives specific to the LLU and VULA charge controls in detail in Sections 2, 3, and 4 of this volume. Our opinion of the likely impact of implementing the proposals (as discussed throughout this consultation) is that the performance of our general and specific duties under section 3 and 4 of the Act is secured or furthered by our proposal to adopt the charge controls.

5.27 We consider that the proposed charge controls for LLU and VULA services will ensure that charges for wholesale services are set at a level that will enable telecoms providers (other than BT) to compete in the provision of downstream services. The existing charge controls for LLU services have promoted competition in this way to the clear benefit of consumers in respect of choice, price and quality of service and value for money.

5.28 We have had regard to the requirement to promote competition and to secure efficient and sustainable competition for the benefit of consumers, which are relevant to both sections 3 and 4 of the Act. We have placed emphasis on the promotion of competition, which we consider is likely to be the most effective way of furthering citizen and consumer interests in the relevant market.

5.29 In making our proposals, we have also sought the least intrusive regulatory measures to achieve our policy objectives and we are proposing to remove existing charge controls where we consider that it is no longer necessary.

Powers under sections 87 and 88 of the Act

5.30 Section 87(1) of the Act provides that, where we have made a determination that a person (here BT) has SMP in an identified services market (here the supply of copper loop-based, cable-based and fibre-based wholesale local access at a fixed location in the UK excluding the Hull Area), we shall set such SMP conditions authorised by that section as we consider appropriate to apply to that dominant provider in respect of the relevant network or relevant facilities and apply those conditions to that person.

5.31 Section 87(9) of the Act authorises the setting of SMP services 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.

5.32 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:

- promoting efficiency;
- promoting sustainable competition; and
- conferring the greatest possible benefits on the end-users of public electronic communications services.

5.33 In setting a charge control, 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.

5.34 In our opinion, the proposed Conditions 7A, 7B, and 7C satisfy section 88 of the Act.

5.35 In Volume 1 of this consultation we are consulting on our view that, absent the charge controls, there is a real risk of adverse effects arising from price distortion by BT as it might fix and maintain some or all of its prices for LLU and VULA services at an excessively high level and/or price in such a way as to create a margin squeeze in the downstream market.[192]

5.36 We also consider that the proposed charge control conditions for LLU and VULA are appropriate for the purposes of promoting efficiency and sustainable competition and

[192] Volume 1, Section 3.

conferring the greatest possible benefits on the users of public electronic communications services.

Promoting efficiency

5.37 We consider that the proposed conditions for LLU and VULA services are appropriate for promoting efficiency, since in the absence of competitive pressures, we believe that BT would have limited incentives to seek to reduce its costs of providing LLU and VULA services.

5.38 As explained in Section 2, setting a CPI-X form of charge control encourages BT to increase its productive efficiency. This will be achieved by allowing BT to keep any profits that it earns within a defined period by reducing its costs over and above the savings envisaged when the charge control was set. The benefits of any cost savings would potentially accrue to the regulated company in the short run and this would give BT incentives to make those efficiency savings. In the longer run, these cost savings could be passed to consumers through reductions in prices, either as a result of competition or through subsequent charge controls. In our view, this form of price regulation is also preferable to a rate of return type of control.

5.39 In addition, the proposed charge controls will increase allocative efficiency by bringing prices more in line with costs. The proposed charge controls have been set to allow BT to earn a reasonable rate of return (the cost of capital) if it is efficient. When forecasting BT's forward looking costs for LLU and VULA services, we are consulting on the assumption that BT will have certain underlying efficiency gains.[193] This is the approach that we have applied over charge control periods to encourage efficient investment.

Sustainable competition and benefits for end-users

5.40 We also consider that the proposed conditions for LLU and VULA services are appropriate to ensure sustainable competition and to confer the greatest possible benefits on users of public electronic communication services.

5.41 Our view is that preventing excessive pricing via a CPI-X form of charge control will promote sustainable competition, which we consider is likely to be the most effective way of benefiting end-users of public electronic communications services. Identifying the appropriate services to be subject to charge controls and the level of those controls, will enable greater choice of services for end-users in terms of choice, price, quality of service and value for money.

5.42 Although part of our proposed charge control for MPF services applies to baskets of services, we have included appropriate safeguards to ensure that BT does not use the pricing flexibility offered to it in an anti-competitive manner to the detriment of end-users.

5.43 We have also taken account of our objective to encourage other telecoms providers to invest in their own networks in order to develop competition for SFBB and Ultrafast services.

[193]See details in Annex 15.

Investment matters

5.44 In proposing charge controls for LLU and VULA services we have also taken into account the need to ensure that BT has the incentives to invest and innovate where it is efficient to do so. We have done this in the following three respects:

- in modelling BT's forecast costs, we have built in a reasonable rate of return on investment;
- we have used a CPI-X form of charge control, which encourages and rewards investment in new, more efficient technologies; and
- we have adopted the anchor pricing approach, which incentivises investment in innovative and more efficient technology.

5.45 We have carefully considered whether BT has had a fair opportunity to make a return on its original investment in SFBB and if a charge control, as proposed for VULA, would be consistent with the fair bet principle, as detailed in Annex 8.

5.46 We consider that our proposed charge controls for LLU and VULA services strike a good balance between potential risk and reward. As the charge controls are set for a fixed duration, BT can benefit under the controls if it manages to increase market share or if outturn costs are lower than anticipated when the charge controls were set.

Section 47 of the Act

5.47 In addition to the requirements in Sections 87(9) and 88 discussed above, Ofcom must be satisfied that any SMP Condition satisfies the test in section 47(2) of the Act, namely that it is:

- 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.

5.48 For the following reasons we are satisfied that this test is met in relation to proposed Conditions 7A, 7B and 7C.

Objective justification

5.49 We have set out our view for consultation in the Volume 1 of this consultation that BT has SMP in the WLA market and Conditions 7A, 7B, and 7C propose charge controls on services within that market where we have identified a risk of a price distortion. In the absence of any charge control, BT would be able to set charges unilaterally and above the competitive level. This would have adverse impacts on both the ability of companies to compete in the downstream provision of services and on consumer choice and value for money. Our view is that BT is unlikely to be incentivised to reduce its costs or set prices at the competitive level. The proposed charge controls have been structured to address these risks while allowing BT to recover its costs,

including a reasonable return on investment. Additionally, we have reviewed each service within the market so that we have introduced an appropriate level of control for individual services where appropriate.

5.50 The structure of the proposed controls is such that BT has an incentive to continue to seek efficiency gains and benefit from efficiencies achieved that are in excess of those anticipated in the review.

5.51 The proposed controls are also objectively justifiable in that the benefits of CPI-X price controls are widely acknowledged as an effective mechanism to reduce prices in a situation where competition does not act to do so.

Undue discrimination

5.52 We are satisfied that the proposed charge controls for LLU and VULA services will not discriminate unduly against a particular person or particular persons because any telecoms provider, including BT itself, will be able to access the services at the charge levels set by the condition. The proposed charges are set to ensure a fair return and price level for all customer groups.

5.53 We consider that the proposed charge controls do not discriminate unduly against BT as it is the only telecoms provider to hold SMP in the WLA market (for the UK excluding the Hull Area) and the proposed controls seek to address that market position, including BT's ability and incentive to set excessive charges for services falling within the controls.

Proportionality

5.54 We are satisfied that the proposed charge controls for MPF and VULA services are proportionate because BT's obligations apply to the minimum set of charges required for the delivery of services within the market that we have provisionally identified BT as having SMP. The charge controls that we have proposed in this consultation are focussed on ensuring that there are reasonable prices for those access services, which are critical to the development of a competitive market.

5.55 We propose to impose a charge control on BT's 40/10 VULA service, whilst permitting continued pricing flexibility on other bandwidths (subject to a fair and reasonable charges obligation). We consider that this proposal addresses our identified competition concerns whilst going no further than is necessary, having regard to our objective to provide conditions that do not undermine investment incentives for competing network providers.

5.56 Under the proposed charge controls BT will be, however, allowed to recover a reasonable return on investment. BT will also have incentives to continue to invest and develop its access network. Moreover, the maximum charges BT is allowed to set over the period of the control has been formulated using information on BT's costs and a consideration of how these costs will change over time.

5.57 Moreover, we are proposing not to impose charge controls on certain services that have previously been subject to such controls, where we no longer consider this to be necessary (e.g. SMPF).

5.58 We therefore consider that the proposed charge controls for LLU and VULA services are:

- appropriate to achieve the aim of addressing BT's ability and incentive to charge excessive prices for the services covered by the charge controls;

- necessary, in that they do not, in our view, impose controls on the prices that BT may 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; and

- such that they do not, in our view, produce adverse effects that are disproportionate to the aim pursued.

Transparency

5.59 We consider that the proposed charge controls are transparent in relation to what they are intended to achieve. The aims and effects of the proposed charge controls are clear and they have been drafted so as to secure maximum transparency. We are consulting fully on the proposed charge controls and our reasoning in this document. Additionally, we have published versions of our volume forecasts model, our top-down model and our bottom-up model, suitably redacted to address BT's legitimate concerns regarding confidential information.

5.60 The text of the proposed conditions has been published in Annex 23 and the operation of those conditions is aided by our explanations in this document. Our final statement will set out our analysis of responses to this consultation and the basis for any final decision that we take.

Sections 3 and 4 of the Act

5.61 We also consider that the proposed charge control conditions for LLU and VULA services are consistent with our duties under sections 3 and 4 of the Act.

5.62 For the reasons set out above, we consider that the charge controls proposed in this consultation will, in particular, further the interests of citizens and of consumers in the relevant market by the promotion of competition in line with section 3 of the Act. In particular, the proposed charge controls seek to ensure the availability throughout the UK of a wide range of electronic communications services. In proposing the charge controls, we have had regard to the desirability of promoting competition in the relevant market, the desirability of encouraging investment and innovation in the relevant market, including by third party telecoms providers, and the desirability of encouraging the availability and use of high speed data transfer services throughout the UK.

5.63 Further, we consider that, in line with section 4 of the Act, the proposed charge controls will, in particular, promote competition in relation to the provision of electronic communications networks, further development of SFBB services and will encourage the provision of Network Access for the purpose of securing efficiency and sustainable competition in the downstream market for electronic communications networks and services, resulting in the maximum benefit for retail consumers.

EU Recommendations and other documents

5.64 In accordance with section 4A of the Act we must also take due account (which in this context means "utmost account") of all applicable recommendations issued by the European Commission under Article 19(1) of the Framework Directive.

5.65 Of particular relevance to the charge control aspects of our review of the fixed access markets are:

- the EC's Recommendation of 11.9.2013 on consistent non-discrimination obligations and costing methodologies to promote competition and enhance the broadband investment environment *(the "2013 EC Recommendation");*[194] *and*

- the EC's Recommendation of 20 September 2010 on regulated access to Next Generation Access Networks (*the "NGA Recommendation").*[195]

5.66 The 2013 EC Recommendation sets out a common approach for national regulatory authorities (NRAs) when imposing obligations of non-discrimination, price control, cost accounting (in particular, cost orientation), and provides further guidance on the regulatory principles established by the NGA Recommendation (in particular the conditions under which cost-orientation of wholesale access prices should or should not be applied).

5.67 Points 30 to 37 of the 2013 EC Recommendation set out a recommended costing methodology for NRAs to follow if setting copper and NGA charges. In the 2014 FAMR Statement, we argued that our continued use of a top-down model to estimate the charges for copper access products was consistent with Point 40 of the 2013 EC Recommendation. Point 40 allows NRAs to continue to apply an existing modelling methodology for modelling copper charges if certain conditions are met. These conditions are that the costing methodology adopted meets the objectives set out in recitals 25 to 28 of the 2013 EC Recommendation and that it satisfies the following criteria:

- if not modelling an NGA network, it should reflect a gradual shift from a copper network to an NGA network;

- it should apply an asset valuation method that takes into account that certain civil infrastructure assets would not be replicated in the competition process;

- it should be accompanied by documented projections of copper network prices showing that they will not fluctuate significantly and therefore will remain stable over a long time period and that the alternative methodology meets the objective of regulatory transparency and predictability as well as the need to ensure price stability; and

- it should require only minimal modifications with respect to the costing methodology already in place in that Member State in order to meet the first three of these criteria.

5.68 We believed these conditions were met for our modelling approach and therefore believed that our approach to estimate the cost of copper services was consistent with the 2013 EC Recommendation.

[194] Commission Recommendation of 11 September 2013 on consistent non-discrimination obligations and costing methodologies to promote competition and enhance the broadband investment environment (C(2013) 5761), 11 September 2013, http://ec.europa.eu/smart-regulation/impact/ia_carried_out/docs/ia_2013/c_2013_5761_en.pdf

[195] Commission Recommendation of 20 September 2010 on regulated access to Next Generation Access Networks (NGA) (2010/572/EU), http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32010H0572&from=EN

5.69 In Section 4 and Annex 11, we discuss our use of the same top-down modelling approach to calculate MPF prices as we used in the 2014 FAMR charge control (with updated inputs). Points 46 and 47 of the 2013 EC Recommendation states that:

> "Once NRAs have finalised the recommended costing methodology, they should consider maintaining it, in application of Article 8 (5) (a) of Directive 2002/21/EC in order to promote regulatory predictability by ensuring stable access prices over at least two appropriate review periods, provided they maintain a price control obligation throughout this period.
>
> When implementing the recommended costing methodology or alternative costing methodologies that comply with points 40 and 44, and the NRA maintains the methodology in line with point 46, NRAs should only update the data input into the costing methodology when conducting a new market review, in principle after three years. When updating the model, the NRAs should in principle, and provided that market conditions have remained stable, only adjust such data in line with the real evolution of individual input prices and should in any case ensure the full recovery over time of the costs incurred to provide of the regulated wholesale access services. NRAs should publish the updated outcome of the costing methodology and resulting access prices over the relevant three-year period." [196]

5.70 We believe that our continued use of a top-down modelling approach to estimate the cost of MPF services is consistent with the 2013 EC Recommendation.

5.71 The 2013 EC Recommendation also sets out detailed recommendations for the methodology to use when estimating the cost of NGA access services. These recommendations include:

- to model of an efficient network using the latest technology employed in large scale networks;[197]
- to use of a bottom-up LRIC+ costing methodology;[198]
- when modelling a fibre deployment NRAs should include existing infrastructure capable of hosting a fibre network;[199]

5.72 We discuss each of these points of detail in Annex 12, but we believe in general that our approach of estimating the cost of GEA services using a bottom-up model that calculates the LRIC+ of an FTTC overlay service is complaint with the 2013 EC Recommendation.

5.73 We note that in the light of particular factors in the context of the market being reviewed, it may be appropriate to depart from these Recommendations. To the extent that our proposals are not consistent with relevant Recommendations, we have explained in this document our reasons for this.

[196] 2013 EC Recommendation, page 22.
[197] 2013 EC Recommendation, page 15.
[198] 2013 EC Recommendation, page 19.
[199] 2013 EC Recommendation, paragraph 32.

BEREC Common Positions

5.74 In considering our proposals for remedies insofar as they apply to the WLA markets we must also take utmost account of relevant Body of European Regulators for Electronic Communications (BEREC) Common Positions.[200]

5.75 We consider the following to be particularly relevant to this consultation:

- BEREC Common Position on remedies in the market for wholesale (physical) network infrastructure access (including shared or fully unbundled access) at a fixed location imposed as a consequence of a position of significant market power in the relevant market. In particular, the following best practices (BPs):
  - BP3: NRAs should encourage infrastructure competition at the deepest level where it is reasonable, to reduce barriers to entry;
  - BP32: NRAs should require SMP operators to provide a reasonable defined level of service;
  - BP35b: NRAs should require that the price of the switch does not act as a barrier to the wholesale switching processes happening;
  - BP41: NRAs should ensure that with reasonable certainty the price of access will permit an efficient entrant to compete with the SMP player. The access price should also be set in a way which is coherent with the prices for other (broadband and narrowband) related services;
  - BP42: When determining their price regulation, NRAs need to consider that it should incentivise both efficient investment and sustainable competition;
  - BP43: Where appropriate and proportionate, NRAs should require SMP operators to provide regulated services based on an explicit pricing obligation. Price control obligations can be implemented in different degrees, ranging from a requirement for prices to be cost-oriented and subject to rate approval, through to specific charge controls such as a price cap, retail minus etc.;
  - BP44: NRAs should determine the costing methodology, taking into account the prioritisation of the regulatory objectives and prevailing market conditions;
  - BP45: When imposing a cost-oriented price control obligation, the NRAs should specify the relevant costing methodology to be used as a reference for setting the charges. Any costing methodology selected must allow the recovery of efficiently incurred costs as the relevant cost standard and follow the principle of cost causality;
  - BP46: It is important that the access price sends the right economic signal, i.e. that the price is competitively (and technologically) neutral. This will best be achieved with cost-oriented access seeking to mimic the outcome of a

[200] BEREC, 2012. Revised BEREC common position on best practice in remedies on the market for wholesale (physical network infrastructure access (including shared or fully unbundled access) at a fixed location imposed as a consequence of a position of significant market power in the relevant market. BoR (12) 127, 8 December 2012. http://www.berec.europa.eu/files/document_register_store/2012/12/20121208163628_BoR_(12)_127__BEREC__COMMON_POSITION_ON_BEST_PRACTICE_IN_REMEDIES_ON_THE_MARKET_FOR_WHOLESALE.pdf.

competitive market, where the equilibrium price reflects the cost of efficient service provision;

- BP47: Since local access in most cases constitutes an enduring bottleneck, NRAs should impose effective regulatory remedies in order to avoid excessive profitability. This implies directly imposing cost-orientation, or where proportionate, indirectly imposing a combination of remedies having the same effect;
- BP48: The effective price granted by the SMP operator should not be discriminatory and should be offered to all operators that meet the established conditions;
- BP51: NRAs should ensure that the pricing of inputs to NGA access products (e.g. ducts) is in line with the pricing of the same product when used as inputs to legacy access products (copper);
- BP52: NRAs should ensure that the pricing of NGA access products (e.g. unbundled fibre access/access to the terminating segment) is consistent with the pricing of legacy access products (copper), to set efficient incentives to invest;
- BP54: Where NRAs decide that it is appropriate to regulate the prices of NGA-based services on the basis of cost-orientation, they should consider whether to differentiate the risks borne by the SMP player in operating its NGA access network from other risks of its business. The investment risk should be assessed by taking account of various factors of uncertainties for the time period considered relevant. This includes an assessment of the likely demand for NGA-based services (penetration) and the willingness to pay a pricing premium (ARPU) and how this develops through time. In case this assessment has identified an NGA-specific risk, it should be factored into the cost of capital; and
- BP55: NRAs should assess pricing schemes proposed by the investor, but price differences should only reflect differences in risk for the investor and must not lead to a margin squeeze.

- BEREC, Common Position on Layer 2 Wholesale Access Products.[201] In particular: CP2: Pricing of L2 WAP (with regard to market 3a).

5.76 For the reasons set out in this document, we consider that our proposals are consistent with these Common Positions.

Consultation question

Question 5.1: Do you agree with each of our proposals in relation to the implementation of charge controls for BT's LLU and GEA services? Please provide reasons and evidence in support of your views.

[201] BEREC, 2016. Common Position on Layer 2 Wholesale Access Products. BoR (16) 162, 6 October 2016. http://www.berec.europa.eu/eng/document_register/subject_matter/berec/regulatory_best_practices/common_approaches_positions/6482-berec-common-position-on-layer-2-wholesale-access-products