

---

# Wholesale Local Access Market Review: Statement – Volume 2

## Charge control design and implementation

[§<] Redacted for publication

---

**STATEMENT**

Publication Date: 28 March 2018

# Contents

---

## Volume 2

1. Introduction	1
2. Economic principles	9
3. Charge control design	33
4. Charge control cost modelling	54
5. Implementation of our WLA charge control decisions and legal tests	70

# 1. Introduction

- 1.1 In Volume 1 of this statement we set out our finding that BT has significant market power (SMP) in the market for wholesale local access (WLA) in the UK excluding the Hull Area. We explained the remedies that we have decided to put in place to address our competition concerns arising from BT's SMP, including charge controls on certain local loop unbundling (LLU) and virtual unbundled local access (VULA) rental and ancillary services.
- 1.2 In this Volume 2, we set out the detail of the charge control remedies, including the economic principles we have applied, the design of the charge controls, our decisions in relation to the various modelling inputs, and the level of the charge controls. For LLU services we set a charge control for certain variants of BT's Metallic Path Facility (MPF) services, which are used to provide broadband and voice services over BT's copper local access connections. This is a continuation of our policy that we have applied in previous reviews. For VULA services, for the first time we are also setting a charge control for certain variants of BT's Generic Ethernet Access (GEA) services, which are used to provide broadband services over BT's fibre connections.
- 1.3 Our approach to regulating VULA services is designed to ensure that we strike an appropriate balance between encouraging new network investment and protecting consumers and competition over the period of this review. In Volume 1, we set out our decision to set a charge control for BT's GEA 40/10<sup>1</sup> fibre to the cabinet (FTTC) service. BT will also be required to price at the same level for its GEA 40/10 fibre to the premises (FTTP) service<sup>2</sup> where FTTC is not available.<sup>3</sup> We have decided to allow BT continued pricing flexibility on other GEA services. In this volume, we set out the detail of the charge controls for those services.
- 1.4 In reaching the decisions set out in detail in this statement, we have taken into account a wide range of evidence and comments received from stakeholders, including those submitted in response to our consultations,<sup>4</sup> as well as from our extensive process of gathering and analysing information. Throughout this statement we make reference to stakeholders' evidence and comments and set out our views on them.<sup>5</sup>
- 1.5 Since we issued our draft Statement in February 2018, we have updated some of the inputs into our models based on new information.<sup>6</sup> In particular, we have updated the

---

<sup>1</sup> Up to 40 Mbit/s downstream and up to 10 Mbit/s upstream.

<sup>2</sup> We have decided to include a control on Fibre Voice Access (FVA) with GEA 40/10 and GEA 40/10 FTTP transition, the details of which are covered in Section 3.

<sup>3</sup> In this statement where we refer to GEA 40/10 rental services, unless we say otherwise, we mean GEA 40/10 FTTC and GEA 40/10 FTTP rental services where FTTC is not available.

<sup>4</sup> Our May 2016 Consultation, our March 2017 WLA Consultation and our September 2017 WLA Consultation. In this statement we do not refer to our consultation on network expansion or address any stakeholder comments on this issue, given the Government's decision not to pursue BT's voluntary proposal to deliver universal broadband.

<sup>5</sup> In Annex 4 we list the main sources of evidence we have considered in reaching our decisions set out in this statement.

<sup>6</sup> As described in Annex 17, we have updated our RPI inflation and electricity price inflation assumptions based on the latest forecasts from the OBR and BEIS respectively. We have also updated our pay inflation assumptions based on BT's new pay deal. In addition, we have modified the cumulo (business rates) costs for Northern Ireland due to revisions in BT's rating assessment (see Annex 21).

adjustments to the base year costs to take account of BT's recently announced pension agreement with the CWU. We have also provided some additional clarifications and corrected some minor errors to the models. These points are explained in the relevant annexes. The net effect of these updates and corrections is a slight increase in the rental charges and a number of the ancillary charges from those presented in the draft statement.

## MPF and GEA 40/10 rentals

- 1.6 The MPF and GEA services are comprised of a rental service and a number of ancillary services (such as connection, migration and cease services). We have decided to set charge controls on MPF rentals, rentals for GEA 40/10 services, and certain ancillary services.
- 1.7 Our approach to setting the charge control for MPF rentals (Service Maintenance Level (SML) 1)<sup>7</sup> is broadly to maintain a stable regulatory regime, with underlying costs estimated on a similar basis to that used in previous market reviews. The charge control will lead to only a small change in MPF rental prices during the charge control period.
- 1.8 Our analysis of GEA 40/10 rental costs suggest that they are significantly lower than the current wholesale prices. The cost-based charge control will therefore significantly reduce wholesale prices for GEA 40/10 rentals by the end of the control period.
- 1.9 Our key decisions for MPF and GEA 40/10 rental services are that:
- the annual rental charge control for MPF will be £84.84<sup>8</sup> in 2020/21 (currently the price is £84.38);
  - the annual rental charge control for GEA 40/10 will be £59.91<sup>9</sup> in 2020/21 (currently the price is £88.80);
  - the new charge controls for MPF and GEA 40/10 rental services will commence on 1 April 2018 and cover the period to 31 March 2021; and
  - prices in 2019/20 and 2020/21 will be at cost-based levels. Prices for 2018/19<sup>10</sup> have been set using a glidepath which has the effect of setting prices two thirds of the way along the glidepath between the 2016/17 prices and our estimate of cost for 2019/20.
- 1.10 Our decisions on the charge controls for MPF and GEA 40/10 rental services are set out in the table below.

---

<sup>7</sup> MPF can be provided at a number of SMLs. Previously we charge controlled SML2. However, we have decided to change this to SML1 as the industry is increasingly using this service. Where we refer to MPF in this statement we mean SML1.

<sup>8</sup> This is our estimate of the price in 2020/21, the actual price will depend on the Consumer Price Index minus the 'X' applied.

<sup>9</sup> This is our estimate of the price in 2020/21, the actual price will depend on the Consumer Price Index minus the 'X' applied.

<sup>10</sup> The charge control for MPF SML 1 in 2018/19 is set as an average over the year. This reflects BT's obligation to give 90 days' notice of any increase in price from the current level.

Table 1.1. Charge controls on MPF and GEA 40/10 rentals\*

	Current annual charge	Charge control nominal annual charge estimates <sup>11</sup> (£)		
		2018/19	2019/20	2020/21
MPF	84.38	85.46	84.95	84.84
GEA 40/10	88.80	69.59	61.12	59.91
MPF plus GEA 40/10	173.18	155.05	146.07	144.75

Source: Output from our control module. Openreach's price list [accessed 23 March 2018]

\*Some of the figures in this table and paragraph 1.9 above have subsequently been amended as set out in the explanatory note: [https://www.ofcom.org.uk/data/assets/pdf\\_file/0011/114203/Explanatory-note-modification-SMP-condition-7a.pdf](https://www.ofcom.org.uk/data/assets/pdf_file/0011/114203/Explanatory-note-modification-SMP-condition-7a.pdf)

## MPF and GEA ancillary services

- 1.11 We have also decided to set a charge control for certain MPF, LLU<sup>12</sup> and GEA ancillary services. These new charge controls will also commence on 1 April 2018 and cover the period to 31 March 2021.
- 1.12 Details of our decisions are set out in the tables below.

<sup>11</sup> This is our estimate of the price in 2019/20 and 2020/21, the actual price will depend on the Consumer Price Index minus the 'X' applied.

<sup>12</sup> LLU includes services where the charge control is applied to MPF and SMPF ancillaries.

Table 1.2: LLU (MPF and SMPF) ancillary services charge controls\*

Basket/service	Cost standard/ charge control decision	Current charge (nominal)	Charge control for 2018/19	Charge control for 2019/20	Charge control for 2020/21
MPF Single Migration	LRIC	£30.26	£26.55	CPI-8.8%	CPI-2.8%
MPF Bulk Migration	LRIC	£20.97	£19.07	CPI-7.2%	CPI-2.7%
MPF New Provides Basket	FAC	Various	CPI-13.4%	CPI-8.3%	CPI-2.8%
MPF Soft Cease	Flat nominal cap	£0	£0	£0	£0
SMPF Soft Cease	Flat nominal cap	£0	£0	£0	£0
Hard Ceases Basket	FAC	Various	CPI-20.3%	CPI-12.0%	CPI-4.1%
Special Fault Investigations	FAC	Various	CPI-15.0%	CPI-9.2%	CPI-2.6%
Time Related Charges	FAC	Various	CPI-15.0%	CPI-9.2%	CPI-2.6%
LLU Tie Cables basket	FAC	Various	CPI-0.3%	CPI-1.6%	CPI-3.1%
LLU Co-mingling New Provides and Rentals services basket	FAC	Various	CPI+31.3%	CPI+13.0%	CPI-5.0%
MPF Standard Line Test	Flat real cap at current charge	£3.93	£4.05	CPI-0%	CPI-0%
Cancellation of MPF orders	Alignment of charges with GEA Bandwidth Modify to 40/10	£10.28	£7.26	CPI-22.2%	CPI-5.5%
Amend MPF orders	Alignment of charges with GEA Bandwidth Modify to 40/10	£10.28	£7.26	CPI-22.2%	CPI-5.5%

Source: Output from our control module. Openreach's price list [accessed 23 March 2018]

\*Some of the figures in this table have subsequently been amended as set out in the explanatory note: [https://www.ofcom.org.uk/data/assets/pdf\\_file/0011/114203/Explanatory-note-modification-SMP-condition-7a.pdf](https://www.ofcom.org.uk/data/assets/pdf_file/0011/114203/Explanatory-note-modification-SMP-condition-7a.pdf)

Table 1.3 GEA ancillary services charge controls<sup>13</sup>

Basket/service	Cost standard/ charge control decision	Current charge (nominal)	Charge control for 2018/19 (nominal)	Charge control for 2019/20	Charge control for 2020/21
PCP <sup>14</sup> Only Install 40/10	LRIC	£49	£46.96	CPI-4.6%	CPI+0.5%
Start of Stopped Line 40/10	LRIC	£11	£4.63	CPI-37.7%	CPI+0.7%
FVA with GEA (FTTP) 40/10 Connection	Flat real cap at current charge	£117	£120.51	CPI-0%	CPI-0%
GEA (FTTP) 40/10 Transition Connection	Flat real cap at current charge	£92	£94.76	CPI-0%	CPI-0%
GEA (FTTC and FTTP) CP to CP Migrations	LRIC	£11	£4.63	CPI-37.7%	CPI+0.7%
GEA (FTTC and FTTP) ceases	Flat nominal cap	£0	£0	£0	£0
1 Gbit/s GEA Cablelink	FAC	£790	£521	£521	£521
10 Gbit/s GEA Cablelink	FAC	£1,800	£1,042	£1,042	£1,042
VLAN moves applied to GEA Cablelinks	Alignment of charges with GEA Bandwidth Modify to 40/10	£11.25	£7.26	CPI-22.2%	CPI-5.5%
GEA Bandwidth Modify - to 40/10	FAC	£11.25	£7.26	CPI-22.2%	CPI-5.5%
GEA 40/10 Cancel/Amend/ Modify – to 40/10 – CRD	Alignment of charges with GEA Bandwidth Modify to 40/10	£11.25	£7.26	CPI-22.2%	CPI-5.5%
GEA 40/10 Cancel/Amend/ Modify - Regrading	Alignment of charges with GEA Bandwidth Modify to 40/10	£11.25	£7.26	CPI-22.2%	CPI-5.5%
Superfast Visit Assure	Flat nominal cap at current charge	£130	£130	£130	£130

Source: Output from our control module. Openreach's price list [accessed 23 March 2018]

## Structure of this volume

- 1.13 The remainder of this volume is structured as follows:
- Section 2 sets out details of our economic principles for setting cost-based charges. We set out details of our decisions on the form of charge controls, the cost standard and allocation of common costs we apply and our network model choice.
  - Section 3 sets out details of our charge control design. This includes the specification of the MPF and GEA rental charge controls, the duration of the charge controls and the speed over which charges will align with costs within the charge controls. We also set out particulars of the basket design for some of the ancillary services and determine how these baskets will work in practice.
  - Section 4 sets out summaries of our models used to determine the costs of MPF and GEA 40/10 rental services and some of the related ancillary services. This includes the top-down model that we use to estimate the costs of MPF services and allocate common costs across all WLA services, and the bottom-up model we have developed to estimate the costs of GEA services. In particular we set out the key modelling decisions that underpin these models, including decisions in relation to the main modelling inputs.
  - Section 5 sets out how our decisions have been implemented in our legal instruments and how they meet the relevant legal tests.
- 1.14 In addition to these sections, there are a number of annexes setting out the detail of the decisions we have taken on various aspects of the charge controls:
- Annex 9 sets out diagrams of the relevant services.
  - Annex 10 sets out details of our service volume forecasts.
  - Annex 11 sets out details of the top-down copper access model that we have used to estimate the costs of MPF services and allocate common costs between copper and GEA services.
  - Annex 12 sets out the adjustments we have made to our base year data and forecasted costs within our top-down model that we have used to estimate the cost of MPF services.
  - Annex 13 sets out details of our modelling on quality of service.
  - Annex 14 sets out documentation on our bottom-up model that we have used to estimate the cost of GEA services.
  - Annex 15 sets out details of the calibration of our bottom-up model.
  - Annex 16 sets out details of the results of our top-down and bottom-up models and sensitives.
  - Annex 17 sets out details of our decision on inflation.

---

<sup>13</sup> The charge controls on GEA (FTTP) ancillaries only apply in areas where the respective FTTP rental is also subject to a charge control. The exceptions to this are the charge controls for GEA (FTTP) CP to CP Migrations, and GEA (FTTP) ceases, which apply in all areas regardless of the existence of a charge control on FTTP rentals.

<sup>14</sup> Primary Cross Connection Point.



- Annex 18 sets out details of the cost and asset volume elasticities we use in our modelling.
- Annex 19 sets out details of our decision on efficiency.
- Annex 20 sets out details of our decision on cost of capital.
- Annex 21 sets out details of our decision on business rates (cumulo).
- Annex 22 sets out details of our decision on the sales of copper and property.
- Annex 23 sets out details of our decision on certain ancillary services.
- Annex 29 is a report from Cartesian on the documentation for the bottom-up model
- Annexes 30 to 32 are NERA's reports on incorporating BT's pension deficit in the cost of capital calculation, update of the equity and asset beta for BT group and comparators and the evidence of difference in risk for fixed versus mobile telecommunications operators.

1.15 Unless stated otherwise, throughout this volume and the related annexes above, all references to sections relate to sections and the related annexes within Volume 2.<sup>15</sup>

1.16 There are also a number of annexes which apply across Volumes 1-3:

- Annex 1 sets out our regulatory framework.
- Annex 2 sets out our general analytical approach to market definition, SMP assessment and remedies.
- Annex 3 sets out our equality impact assessment.
- Annex 4 sets out our sources of evidence.
- Annex 8 sets out our decision on regulatory financial reporting.
- Annex 27 sets out our glossary.
- Annex 28 sets out Cartesian's GEA allocations report.
- Annex 33 sets out our legal instruments.

1.17 Alongside this statement we have also published the following models:

- a version of the top-down copper access model that estimates the costs of MPF services and allocates common costs between copper and GEA services and includes non-confidential input data and formulae;
- a version of the bottom-up cost model that estimates the long run incremental costs (LRIC) of GEA services and includes non-confidential data and formulae;
- a version of the volume forecast which generates the forecasts for the different MPF and GEA services across the charge control period and includes non-confidential input data and formulae;
- a version of the base year model that sets out the 2016-17 costs for the different aspects of the charge controls and includes non-confidential input data and formulae;
- a version of the control module that contains the inputs from both the top-down and bottom-up models and includes non-confidential input data and formulae; and

---

<sup>15</sup> All references to information we have gathered using our formal powers (s.135 notices) unless otherwise stated is to information collected under the WLA charge control project.

- a version of the repair cost model that forecasts the repair costs of copper services and includes non-confidential input data and formulae.

1.18 We note that as a consequence of the redactions and randomisation of numbers, the final outputs from the models are not consistent with the results shown in Volume 2 and related annexes. In determining which models to disclose, we have had regard to our obligations under the Communications Act 2003 and our Framework for Disclosure of Charge Control Models.<sup>16</sup> Alongside these models, we have also published the findings of an external review of these models undertaken by Plum Consulting London LLP.

---

<sup>16</sup> Ofcom. Framework for disclosure of charge control models  
[http://stakeholders.ofcom.org.uk/binaries/consultations/784024/Charge\\_control.pdf](http://stakeholders.ofcom.org.uk/binaries/consultations/784024/Charge_control.pdf).

## 2. Economic principles

- 2.1 In this section, we explain our general approach to setting charge controls for MPF and GEA services and then outline our decisions on the following:
- **Form of controls:** we are imposing charge controls on MPF and GEA rental services, indexed by CPI inflation,<sup>17</sup> designed to align charges to forecast efficient costs.
  - **Network choice:** we are setting charges based on the efficient ongoing costs of providing MPF services over a copper network and GEA services using a FTTC overlay.
  - **Cost standard and allocations of common cost for MPF and GEA services:** we forecast total aggregate WLA and Wholesale Fixed Analogue Exchange Line (WFAEL)<sup>18</sup> costs based on current cost accounting for fully allocated costs (CCA FAC). We forecast MPF and GEA service costs on the basis of long run incremental costs plus an allocation of common costs (LRIC+). We allocate common costs between LLU, WFAEL and GEA services on an equi-proportionate mark-up (EPMU) basis. We then allocate costs between GEA services with different speeds based on the current observed difference in prices: the so-called ‘bandwidth gradient’. We also set out the circumstances where we may use different cost standards for other non-rental services.
  - **Adjustments to cost data:** in order to ensure our model of MPF services reflects the costs of an ongoing efficient copper network, we have had to make some adjustments to the base year (2016/17) cost data that we use as the basis of our cost modelling.
- 2.2 For each topic, we briefly set out our consultation proposals then discuss stakeholder responses before setting out our reasoning and decisions.

### Approach to imposing the WLA charge controls

- 2.3 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.<sup>19</sup>
- 2.4 In Volume 1 (Sections 5 and 9), we set out our approach to price regulation in the WLA market to address the competition concerns resulting from BT’s SMP in WLA and that support our overall strategy as set out in our Strategic Review.<sup>20</sup> A key focus of our strategy when considering the appropriate remedies in the WLA market is to ensure telecoms providers have sufficient incentives to invest in new full-fibre networks while balancing the need to protect competition and ultimately consumers in the short term. We have set out

---

<sup>17</sup> Note that a number of ancillary services will be subject to a charge control on a different basis (e.g. nominal flat caps). See Annex 23 for further details.

<sup>18</sup> 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 the appropriate allocation of common costs.

<sup>19</sup> Section 88 of the Communications Act 2003 (the Act).

<sup>20</sup> [https://www.ofcom.org.uk/\\_data/assets/pdf\\_file/0016/50416/dcr-statement.pdf](https://www.ofcom.org.uk/_data/assets/pdf_file/0016/50416/dcr-statement.pdf).

below the regulatory objectives we have used when considering how to implement the pricing remedies identified in Volume 1.

- 2.5 As 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.
- 2.6 As set out in Volume 1, we are imposing charge control remedies on MPF services<sup>21</sup> and GEA 40/10 services.<sup>22</sup> In this section, we set out how we have taken into account and balanced these objectives in developing our approach to setting the charge controls.

## Form of controls

### Our proposals

- 2.7 We proposed to impose charge controls, indexed by CPI inflation, designed to align charges to forecast efficient costs.

### Stakeholder responses

- 2.8 In relation to the form of controls, Openreach supported our proposed approach, stating that “well-designed CPI-X controls provide incentives for regulated firms to drive efficiency improvements and make ongoing investments. Consumers benefit from lower prices and/or improved service as a result.”<sup>23</sup> We address Openreach’s arguments as to whether to set a charge control for GEA 40/10 in Volume 1.
- 2.9 We did not receive any other substantive comments on our proposals on the form of the controls.

---

<sup>21</sup> We are also charge controlling some SMPF ancillary services (i.e. SMPF soft and hard ceases). See Annex 23 for details.

<sup>22</sup> As discussed in Annex 23, we are also charge controlling some ancillary services that are provided with all GEA variants.

<sup>23</sup> Openreach response to the March 2017 WLA Consultation – Volume 2, paragraph 31.

## Our reasoning and decisions

- 2.10 We are applying inflation indexed charge controls for the MPF and GEA services in question, where the price cap is annually updated for inflation minus an adjustment to close the gap between prices and forecast efficient costs over time. We refer to this approach as CPI-X.<sup>24</sup> As discussed below, this form of control has a number of desirable properties and 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 Openreach incentives to enhance its efficiency and make efficient investments. Providing such incentives is therefore important for meeting our charge control objectives and something we must consider under section 88 of the Act.
- 2.11 Cost based price cap regulation provides an incentive for the regulated entity to make efficiency gains over and above those forecast as part of the control. In contrast, ‘rate of return’ or cost-plus regulation puts more emphasis on aligning charges with cost but provides the regulated firm with weaker incentives to minimise costs. Under price cap regulation, if Openreach is able to deliver the required services at a lower cost than has been forecast, it can keep the profits resulting from these savings. Hence, a price cap provides incentives to ‘outperform’ the control and improve efficiency over time. When the charge control is reset during the next market review process, customers can benefit in the longer term from these additional efficiency gains through lower prices.
- 2.12 Price cap regulation can also provide incentives for efficient investment. The level of the charge control is set to allow Openreach 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.
- 2.13 We therefore consider 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. We consider it is appropriate to continue using an indexed price cap approach and we have used this approach to implement the WLA charge controls.

## Network choice

### Our proposals

- 2.14 We proposed using an anchor pricing approach whereby charges would be set based on the costs of providing MPF services over a national efficient ongoing copper network and GEA services using an FTTC overlay.

---

<sup>24</sup> The Consumer Prices Index is our preferred measure of inflation for setting inflation minus/plus ‘X’ charge controls (see 2014 FAMR Statement, Volume 2, paragraph 3.110-3.164).

## Stakeholder responses

- 2.15 Openreach did not object to the principle of using of an anchor pricing approach. However, it was concerned that our approach was based on an unrealistic scenario where the costs in the model only included FTTC investment, but our volume forecasts did not reflect the loss of lines to Virgin Media that it considered would result from Openreach not investing in higher speed capabilities. Openreach proposed that we should rectify this by reducing forecast volumes for copper and GEA services in the model.<sup>25</sup>
- 2.16 Vodafone disagreed with our approach, stating that any modelling approach that enabled BT to recover higher costs relating to operating older technology services would simply incentivise BT to continue to use older technology for longer. Vodafone considered that we should seek to model the most up to date technology available and base charge control models on the most efficient technology.<sup>26</sup> It also commented on our use of ongoing network adjustments, specifically highlighting the excessive profits that BT is allowed to make due to this adjustment.<sup>27</sup>
- 2.17 CityFibre argued that we should model a reasonably efficient operator rather than basing the models on BT's costs in recognition of the significant economies of scale and scope enjoyed by Openreach, as opposed to new market entrants and the fact that new entrants would be likely to implement a full-fibre network. In addition, CityFibre considered it was not reasonable to set charges on the basis of Openreach's current market share. It suggested that costs should be modelled on the basis of a one third market share for BT, with the other two thirds split between Virgin Media and another entrant (with a full-fibre (i.e. FTTP) network).<sup>28</sup> CityFibre said that a second-best approach would be to adjust Openreach's costs to take into account the loss of economies of scale due to a loss in market share (modified equally efficient operator (MEEO) approach).<sup>29</sup>

## Our reasoning and decisions

### Network choice

- 2.18 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.<sup>30</sup>

---

<sup>25</sup> Openreach response to the March 2017 WLA Consultation – Volume 2, paragraphs 42 to 48.

<sup>26</sup> Vodafone response to the March 2017 WLA Consultation, paragraphs 9.1 to 9.4.

<sup>27</sup> Vodafone response to the March 2017 WLA Consultation, paragraphs 7.6 to 7.8.

<sup>28</sup> CityFibre response to the March 2017 WLA Consultation, paragraphs 8.6.3 to 8.6.15.

<sup>29</sup> CityFibre response to the March 2017 WLA Consultation, paragraphs 8.6.16 to 8.6.20.

<sup>30</sup> 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 paragraphs 4.54-4.81, Ofcom, *Leased Lines Charge Control. Proposals for a new charge control framework for certain leased lines services - Consultation*, 5 July 2012, [https://www.ofcom.org.uk/data/assets/pdf\\_file/0026/40688/lcc\\_2012.pdf](https://www.ofcom.org.uk/data/assets/pdf_file/0026/40688/lcc_2012.pdf) (2012 Leased Lines Charge Control Consultation).

- 2.19 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 such technological 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.
- 2.20 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.
- 2.21 Vodafone and CityFibre believed the charge control should be set on the basis of the most efficient technology available. In the present case, this is likely to be full-fibre (i.e. FTTP) technology because we would expect an infrastructure operator building a network today to deploy an FTTP network. While we accept that the cost of voice and broadband services could be modelled on the basis of an FTTP network, we would have some concerns with using an FTTP network as the basis for setting charges.
- 2.22 We believe that there would be considerable scope for error in using the costs of an FTTP network to determine the cost of services delivered over the existing copper/FTTC network. There is no FTTP operator of national scale 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 assess the extent to which the cost of the FTTP network would need to be reduced (or ‘abated’) to take account of the fact they were providing lower functionality<sup>31</sup> (either in the form of MPF or GEA-FTTC services). We therefore believe that the current proven technologies<sup>32</sup> provide a better basis for our charge controls.
- 2.23 In deciding to use the anchor pricing approach, we recognise that inherent in this approach is the risk that setting prices on the basis of the legacy technology will result in prices diverging from cost and hence losses to static efficiency. However, for the reasons set out above we believe the risks associated with modelling on the basis of full-fibre are greater and errors in determining costs could result in more harmful effects, such as disincentivising investment in full-fibre networks. As set out above, preserving the investment incentives faced by BT and its competitors are key objectives of our charge control.
- 2.24 We have therefore decided to use an anchor pricing approach based on our forecast of the efficient costs of Openreach’s existing copper network and FTTC overlay.

---

<sup>31</sup> 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.

<sup>32</sup> By proven technology, we mean an established technology that is currently offering the services that we are seeking to charge control.

### **Choice of reasonably efficient operator (REO) versus equally efficient operator (EEO)**

- 2.25 When setting charge controls on BT's services, we have typically set prices based on BT's own costs, sometimes referred to as the EEO approach. CityFibre's argument that the charge control should be based on the costs of an REO or an MEEO stems from Openreach's greater economies of scale compared to new entrants and concerns around challenges new entrants may face in terms of attracting customers onto their network and gaining sufficient market share to be profitable.
- 2.26 As set out in Section 9 of Volume 1, we acknowledge these challenges but consider that our approach of a charge control on the basis of Openreach's costs for MPF and GEA 40/10 FTTC and continued pricing flexibility for higher speeds is consistent with substantial FTTP deployment by efficient rivals to BT during the review period. On this basis, we have decided to maintain our approach of setting the charge control based on BT's network and expected costs (rather than the costs of a hypothetical entrant operator).

### **Network choice for modelling the cost of MPF services**

- 2.27 We have used the anchor pricing approach to set a number of charge controls in the past, including the last three controls on MPF charges. In the 2014 FAMR Statement, we used this approach for LLU and WFAEL rather than modelling the MEA (which would have likely been an FTTP network with costs abated to the level to provide these services).
- 2.28 For the reasons set out above, we have set charges for MPF 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. This means that in our modelling we allow Openreach sufficient capital expenditure each year to replace assets as they become depreciated. We are using a top-down model based on BT's accounting data to calculate the cost of providing MPF services, with some adjustments where appropriate (such as uplifting the cost of heavily depreciated assets) to ensure consistency with our overall approach to modelling. We set out how we have modelled this network in more detail in Section 4 and Annex 11.

### **Network choice for modelling the cost of GEA services**

- 2.29 Fibre services can be delivered over a number of different technologies. We set out in Section 4 and Annexes 14 and 29 the precise technological configuration of the network that we have modelled and respond to stakeholders' comments on fibre cost modelling (i.e. GEA costs) made in response to our consultations.
- 2.30 As with our copper network modelling, we have used an anchor pricing approach and set prices on the basis of an FTTC overlay to the copper network (which provides the connection to the premises). As set out in Annex 14, the advantages of this approach are that it allows us to model the costs of the predominant technology used to deliver GEA services in the UK and will ensure that customers are not worse off by the introduction of



“new” technologies.<sup>33</sup> As such, 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 GEA services (e.g. G.fast or FTTP).

- 2.31 Openreach argued that the forecast of its GEA services provided using FTTC should be reduced because in reality if it did not invest in next generation services it would lose customers to competing networks. As set out in Annex 10, our volume forecasts represent our best view of Openreach’s service volumes during the review period. If we were to reduce our forecast of Openreach lines this would result in an increase in unit costs due to the presence of fixed costs. In a competitive market, however, we would not expect the introduction of a new technology to result in an increase in the costs of services using legacy technologies. Therefore, we do not consider it appropriate to insulate Openreach from the effect of competition by adjusting the volume forecast as suggested.
- 2.32 In deriving our volume forecasts, we have included an assumption that for a given level of competitive network coverage Openreach will maintain its historical rate of customer losses going forward.<sup>34</sup> This is consistent with the anchor pricing approach which sets MPF and GEA 40/10 prices on the basis of the costs of the current technology but does not preclude Openreach from providing equivalent or higher speed services using newer technologies. To the extent that increased demand for higher bandwidth services will require Openreach to invest in newer technologies, the anchor pricing approach will allow them to do so.
- 2.33 The inputs that we used to estimate FTTC costs did not require the same sort of adjustments as those we used for the top-down MPF 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. However, in specifying the bottom-up model we have recognised that in times of technology change the economic life of assets may become shorter than their physical life (i.e. resulting in stranded assets). For this reason, as set out in Annex 14, we have set the lifetime of some of the FTTC assets used to provide Openreach’s GEA services to provide Openreach with recovery of its costs in full over the economic life of the assets.
- 2.34 As discussed below and in Annex 14, we use a current cost accounting (CCA) depreciation approach<sup>35</sup> 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 14, we have performed cross-checks to ensure this is not the case in our model and do not consider that further adjustments are necessary.

---

<sup>33</sup> The anchor pricing approach ensures customers are not made worse off because operators are incentivised to deploy new technologies that can deliver the same services at a lower unit cost or new and/or enhanced services for which customers are prepared to pay a price premium.

<sup>34</sup> As set out in Annex 10, this takes account of expected customer losses to Virgin Media and other network operators on the basis of the rate of customer losses in areas where Openreach has been competing with Virgin Media.

<sup>35</sup> Under the CCA accounting convention, assets are valued and depreciated according to their current replacement cost.

## Cost standard and allocation of common costs for MPF and GEA services

### Our proposals

- 2.35 In our March consultation, we proposed to forecast total aggregate WLA and WFAEL<sup>36</sup> costs based on BT's CCA FAC. For MPF and GEA services specifically, we forecast costs on the basis of LRIC+.
- 2.36 We proposed allocating common costs between MPF and GEA rentals on an EPMU basis. We then proposed to allocate these GEA costs between services with different speeds based on the current observed difference in prices: the so-called 'bandwidth gradient'.
- 2.37 In addition, we proposed using different cost standards for other non-rental services where appropriate to promote competition and encourage investment. The circumstances in which we considered BT should be able to recover only the LRIC of a service are most likely to be where:
- a) the service is key to the competitive process, for example, because it supports customer switching between telecoms providers; or
  - b) we are setting price differentials between substitute services using LRIC in order to give good incentives for cost minimisation.<sup>37</sup>

### Stakeholder responses

#### Cost standard

- 2.38 Openreach agreed that FAC and LRIC+ are generally appropriate cost standards and that it might be appropriate to adopt a LRIC only standard, albeit in limited circumstances.<sup>38</sup> Specifically in relation to MPF Rental SML1,<sup>39</sup> Openreach said that using LRIC+ could be appropriate if the LRIC+ cost stack has been calculated correctly.<sup>40</sup> Openreach also broadly agreed with our proposals to use different cost standards for other non-rental services.<sup>41</sup> We discuss and address Openreach's responses on non-rental services in more detail in Annex 23.

---

<sup>36</sup> 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.

<sup>37</sup> In addition, as set out in Annex 23, we have set certain cease service charges at zero because the costs of cease activities are already captured within the rental service costs.

<sup>38</sup> Openreach response to the March 2017 WLA Consultation – Volume 2, paragraphs 34-38.

<sup>39</sup> SML1 is Service Maintenance Level 1 which promises a repair within two working days, Monday to Friday.

<sup>40</sup> Openreach response to the March 2017 WLA Consultation – Volume 2, paragraph 92.

<sup>41</sup> Openreach response to the March 2017 WLA Consultation – Volume 2, paragraphs 69-73.

### Common cost allocation approach

- 2.39 TalkTalk supported our general approach to allocating common costs, both between MPF and GEA services and between different GEA bandwidth services.<sup>42</sup> In relation to the volumes used to allocate common costs between GEA services, TalkTalk believed that we should commit to reweighting the charge control based on the expected customer mix between GEA speed variants at the time of the next WLA market review.<sup>43</sup>
- 2.40 Openreach said that it had no substantive concerns with using an EPMU approach to allocate common costs but had a number of concerns with Ofcom’s application of this approach (which we detail in Annex 12).<sup>44</sup>
- 2.41 CityFibre disagreed with the use of the EPMU approach to allocate costs between MPF and GEA services and argued that common costs should be allocated only to GEA services. CityFibre’s main reasons for this proposed approach were:
- Allocating all common costs to GEA would better promote investment in competitive networks. CityFibre considered that this would encourage telecoms providers to invest in technology required for higher speeds of broadband (e.g. full-fibre networks) as it would allow them to set a price that would generate an appropriate level of return. The consequent reduction in MPF prices would result in it being perceived as the ‘bargain’ brand, encouraging consumers to move towards the premium higher speed full-fibre services.<sup>45</sup>
  - In the long-term, fibre assets will increasingly replace the legacy copper network. An approach that recovers a significant amount of common costs from the copper network (as under the EPMU approach) could result in the need for increases in prices of price-controlled fibre based services in the future as customers migrate to them.<sup>46</sup>
  - Unlike Openreach, rivals who operate competing fibre networks are unable to spread common costs across both copper and fibre services: “an equally efficient rival would be required to recover all its costs from SFBB raising its prices relative to BT and making it uncompetitive”.<sup>47</sup>
- 2.42 In addition, CityFibre argued that an approach that attributed common costs on the basis of bandwidth would perform better than an EPMU approach in relation to the six main principles of cost allocation.<sup>48</sup> This, it said, is because the bandwidth approach recognises that consumers would gain greater utility from fibre than copper and a higher price would be expected to match a higher willingness to pay.<sup>49</sup>

---

<sup>42</sup> TalkTalk response to the March 2017 WLA Consultation, paragraphs 6.28-6.30 and 7.4-7.5.

<sup>43</sup> TalkTalk response to the March 2017 WLA Consultation, paragraphs 7.6-7.12.

<sup>44</sup> Openreach response to the March 2017 WLA Consultation – Volume 2, paragraphs 40-41.

<sup>45</sup> CityFibre response to the March 2017 WLA Consultation, paragraphs 8.6.30-8.6.36.

<sup>46</sup> CityFibre response to the March 2017 WLA Consultation, paragraphs 8.6.22-8.6.24 and 8.6.40-8.6.43.

<sup>47</sup> CityFibre response to the March 2017 WLA Consultation, paragraphs 8.6.37-8.6.38.

<sup>48</sup> The six principles of cost allocation referred to are: cost causation, cost minimisation, distribution of benefits, encouragement of effective competition, practicality, reciprocity (where relevant). This is set out in Ofcom, *Valuing Copper Access Final Statement*, 18 August 2005, paragraph 4.52.

<sup>49</sup> CityFibre response to the March 2017 WLA Consultation, paragraphs 8.6.50-8.6.62.

## Our reasoning and decisions

### Balancing different aspects of economic efficiency

2.43 As set out above under our key charge control objectives, when setting charge controls we aim to promote efficient investment by both Openreach and competitors to Openreach whilst allowing Openreach 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*

2.44 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.

2.45 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,<sup>50</sup> 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*

2.46 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). 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 services at LRIC and allocating common costs accordingly. An example of how we have taken productive efficiency into account is our approach to determining the allocation of common costs between MPF rentals and WLR rentals as discussed below.

---

<sup>50</sup> Ramsey pricing allocates common costs on the basis of relative inverse demand elasticity (a measure of how responsive demand is to price).

### *Dynamic efficiency*

- 2.47 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 Openreach and other telecoms providers.
- 2.48 Below, we discuss how we have considered these different forms of efficiency in determining our approach for implementing the charge controls. First, we discuss our approach to choosing an appropriate cost standard. Second, we discuss our approach to choosing an appropriate cost allocation method.

### **Cost standard**

- 2.49 We have set the charge controls on the basis of an efficient national telecoms operator using a copper network with an FTTC overlay. In order to calculate these costs, we have used Openreach's costs as a starting point. We have set charges to recover our forecast of Openreach's FAC across the market as a whole but set MPF and GEA 40/10 rental charges on the basis of our estimate of LRIC+. Below, we set out our reasoning for reaching this view, taking into account stakeholder responses and any further considerations we have factored into our decision.

### *Choice between CCA FAC or LRIC+*

- 2.50 When setting charge controls on BT using BT's accounting cost data, we have typically done so on the basis of a CCA FAC cost standard. For example, we based the previous MPF/WLR, Wholesale Broadband Access (WBA) and Leased Lines (LLCC) charge controls on BT's CCA FAC. As set out below, we consider that the use of BT's CCA FAC (or a similar approach such as LRIC+) provides efficient build and buy signals as it reflects the current replacement costs of BT's assets. In principle, charges set on this basis will encourage entry where the entrant is as, or more, efficient than BT. In addition, it has the advantages of being transparent and practicable to implement as BT's costs are known and are based on its Regulatory Financial Statements (RFS) which are publicly available to stakeholders each year. Using BT's costs also has the benefit of leading to consistent cost recovery decisions both over time, and between other regulated markets.<sup>51</sup>
- 2.51 As noted in the 2012 LLU WLR Charge Control Statement, there may be little difference between CCA FAC and LRIC+.<sup>52</sup> 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.<sup>53</sup> The LRIC+ of a service is calculated as the forward looking incremental cost of a service and includes an allocation

---

<sup>51</sup> In contrast, using the costs of a hypothetical entrant could raise significant concerns of inconsistency between controls, and over time, opening scope for both under- and over-recovery of BT's costs.

<sup>52</sup> Ofcom, 2012. *Charge control review for LLU and WLR services – Statement*, paragraph 3.19. [https://www.ofcom.org.uk/data/assets/pdf\\_file/0024/53808/statementmarch12.pdf](https://www.ofcom.org.uk/data/assets/pdf_file/0024/53808/statementmarch12.pdf).

<sup>53</sup> There are a number of different approaches that can be taken to allocate these indirect costs (e.g. profit weighted net replacement costs (NRC) or total pay costs).

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.

- 2.52 Both cost standards involve using accounting rules and assumptions for the recovery of common costs for different services. They both reflect forward looking costs rather than the actual prices at the time the relevant assets were purchased, giving a better signal for efficient investment and entry than historic costs.
- 2.53 In past MPF 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 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 the outputs 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.
- 2.54 As discussed in Section 4 and Annexes 14 and 29, 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 of calculating LRIC independently of BT's LRIC model. However, to allocate common costs for fibre services we are reliant on BT's CCA FAC data.

#### *Decision to use CCA FAC across the WLA Market*

- 2.55 We have decided to continue to use CCA FAC as the basis for forecasting the efficient total aggregate cost across the WLA market.<sup>54</sup> CCA FAC has been used to set MPF prices across a number of control periods and has been considered previously in the Competition Commission's<sup>55</sup> Final Determination in the LLU and WLR Appeals.<sup>56</sup> It can also be reconciled to BT's RFS, which is published by BT and independently audited. BT CCA FAC data still provides us with the best source of cost data across all services in the market, which is important when we wish to allocate common costs.
- 2.56 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

---

<sup>54</sup> 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.

<sup>55</sup> Now the Competition and Markets Authority (CMA).

<sup>56</sup> 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/5332def6e5274a566000001/Final\\_determinations\\_PDF\\_2.6\\_Mb\\_.pdf](https://assets.publishing.service.gov.uk/media/5332def6e5274a566000001/Final_determinations_PDF_2.6_Mb_.pdf).

within the basket to be above or below FAC. We discuss the cost standard and charge control structure that we use for each individual ancillary service in Annex 23.

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

- 2.57 Although we are using CCA FAC to estimate aggregate costs across the total market, we have estimated costs for MPF and GEA 40/10 rental services on a LRIC+ basis. As discussed above, we are able to calculate the LRIC of GEA services provided using FTTC from our bottom-up model. We are also able to obtain LRIC estimates for services using BT's copper network from BT's LRIC model. By using a CCA FAC approach for the total market, we can have more confidence that we are not missing, or double counting costs and that costs are relatively transparent and audited.
- 2.58 A LRIC+ approach allows the recovery of Openreach's incremental cost plus an allocation of its common costs on a forward-looking basis. By allowing the recovery of both Openreach's incremental and common costs in the charges for services, we do lose some allocative efficiency, but we preserve Openreach's incentives to invest. Setting prices at this level is also more likely to be consistent with other telecoms providers having incentives to invest in competing networks, which is beneficial for dynamic efficiency.
- 2.59 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 services using BT's copper network and GEA services). We discuss this in more detail below, and set out how we allocate common costs between different copper and fibre services.

**Common cost approach**

- 2.60 We aim to allocate common costs between services in order to create 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 prices lead us to set an efficient structure of prices in the charge controls in order to meet the objectives we set out in paragraph 2.5.
- 2.61 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 us and other regulators in pricing determinations. Although conceptually there may be other approaches that are better for promoting static efficiency, such as Ramsey pricing, we are not able to implement these other approaches accurately and we consider EPMU is an acceptable, practical alternative. We therefore consider it appropriate to use EPMU to allocate common costs between MPF and GEA services.
- 2.62 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 MPF or GEA services in order to promote sustainable competition. At the extreme, all common costs could be allocated either solely to MPF or GEA services (as suggested by CityFibre).

- 2.63 As set out in the March consultation, we have estimated that, in comparison to EPMU, allocating all common costs to GEA services in 2020/21 would decrease the MPF price by around 35%, while increasing the GEA 40/10 charge by around 85%, with the net impact on MPF plus GEA 40/10 FTTC being an increase of around 15%. In contrast, allocating all common costs to copper services in 2020/21 would increase the MPF price by around 15% relative to EPMU. The GEA 40/10 FTTC charge would decrease by around 35% with the net impact on MPF plus GEA 40/10 FTTC 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:	
	Copper services	GEA services
MPF impact	Increase: 15%	Decrease: 35%
GEA 40/10 FTTC impact	Decrease: 35%	Increase: 85%
MPF+GEA 40/10 FTTC impact	Decrease: 5%	Increase: 15%

Source: Ofcom analysis

- 2.64 Allocating significantly more common costs to Openreach’s copper services, and away from GEA services, could disincentivise new network build and weaken the promotion of sustainable competition. This is because the wholesale costs of buying inputs to higher bandwidth broadband services (e.g. MPF+GEA) would decrease, as the common costs allocated to GEA services under EPMU would instead be spread across a greater number of copper lines. This would push down retail superfast broadband prices, potentially decreasing the profitability of an alternative full-fibre network that relies upon demand for higher bandwidth services.
- 2.65 CityFibre considered that allocating all common costs to fibre services would better promote dynamic efficiency as it would encourage entry by allowing operators with competing networks to earn higher returns. We agree that one factor affecting competing operators’ average prices and incentives to invest in new networks is the level of the MPF plus GEA 40/10 price. However, as set out in Volume 1, we consider that there are a number of other factors which are likely to influence investment incentives that do not relate to this price.
- 2.66 Although prices in the short term are important, given the scale and nature of the investments needed to build competing full-fibre networks, the time horizons being considered for relevant factors such as the level of prices in the market are likely to span well beyond the period of these charge controls (which will expire in March 2021). As set out in the March consultation, the impact of the allocation approach on the combined MPF plus GEA 40/10 price depends on the relative volumes of the MPF and GEA services. This means that over time as fibre penetration increases, the difference between the EPMU approach and allocating all common costs to GEA would decrease, so that by the time all customers have switched to fibre services there would be no difference. Hence, we do not



believe that allowing prices to fluctuate due to this transitory impact would promote competitive investment in the long term.

- 2.67 A further consideration when deciding between allocation approaches is the possible effect on consumers' incentives to migrate from copper to fibre services. A significant increase in prices of retail services using fibre connections could decrease static efficiency, which could mean slower migration to fibre connections, particularly if combined with a decrease in the MPF price. The fact that the relative prices of copper and fibre services have an impact on migration decisions is supported by market research evidence (discussed in Annex 5) which suggests that price was the major reason among respondents not intending to upgrade their broadband speed.<sup>57</sup> We therefore consider a common cost allocation approach that resulted in an increase in the GEA 40/10 price and a decrease in the MPF price, could make it harder to attract customers to full-fibre services and therefore hamper the promotion of sustainable competition.
- 2.68 In addition, we do not think that any loss in static efficiency for fibre services would be counterbalanced by an increase in take-up of copper services to any material extent. This is because the penetration of broadband is already very high – with 82% of adults with fixed broadband access<sup>58</sup> – and of those without broadband most are likely to be insensitive to price decreases. Among UK adults without internet access at home, more than half did not think they needed it.<sup>59</sup>
- 2.69 Another reason why CityFibre objected to the use of EPMU for cost allocation is that it believed this approach would not take account of the fact that GEA customers have a higher willingness to pay than copper customers and they should therefore make a larger contribution to common costs. We agree that the EPMU approach does not take into account customers' willingness to pay – as set out above, it is a practical alternative when other approaches, such as Ramsey pricing, are not possible because of the lack of necessary detailed information (such as demand elasticities). However, the EPMU approach does result in fibre customers contributing more to common costs than copper customers. This is because GEA is an overlay service that is purchased alongside a copper service (either MPF or WLR). Customers purchasing Openreach's GEA services will therefore contribute to common costs both through the copper service charge as well as through the GEA charge, whereas customers taking copper services contribute through the copper service charge only. Therefore, to the extent that customers using services provided over fibre have a higher willingness to pay than customers using services provided on the copper network, the EPMU approach would not be inconsistent with the six principles of cost recovery as it does allocate more common costs to GEA services.

---

<sup>57</sup> This is somewhat contrary to CityFibre's argument that lower MPF prices and high GEA prices would encourage consumers to trade up to the 'middle' option of FTTC. We note that CityFibre's theory relies on broadband being an experience good, such as beer, as in the cited Huber and Puto experiment. We consider that our market research evidence is more relevant to the services in question.

<sup>58</sup> Ofcom, 2017. *The Communications Market 2017: Telecoms and networks*, figure 4.4.

[https://www.ofcom.org.uk/data/assets/pdf\\_file/0023/26393/uk\\_internet.pdf](https://www.ofcom.org.uk/data/assets/pdf_file/0023/26393/uk_internet.pdf).

<sup>59</sup> *The Communications Market 2017: Internet and online content*, figure 5.15.

- 2.70 In summary, we continue to consider that 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 services could also distort competition as different telecoms providers sell quite different proportions of copper and fibre services. Increasing common cost allocations to GEA could also have negative consequences for static efficiency and migration between copper and fibre services.
- 2.71 On this basis, we have decided to allocate common costs between copper and FTTC services based on an EPMU approach.

#### **Recovery of common costs between copper services**

- 2.72 Although we are not setting a charge control for WLR and SMPF<sup>60</sup> services, we 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.
- 2.73 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 WLR and (ii) MPF and WLR+SMPF equal to the absolute difference in their incremental costs to maximise productive efficiency.
- 2.74 We are still of the view that MPF and WLR+SMPF are close substitute wholesale services and note that stakeholders did not comment on this point in response to our consultations. We have therefore taken the same approach to 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**

- 2.75 We now consider what proportion of the common costs that are allocated to GEA rental services should be allocated to BT's GEA 40/10 rental services and what proportion of common costs should be allocated to other GEA rental services.<sup>61</sup>
- 2.76 The network resources used to provide different GEA variants is nearly 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.
- 2.77 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

---

<sup>60</sup> As discussed in Section 1 and Annex 23, we have decided to charge control SMPF cease services. Also, the services in the Co-mingling new provides and rentals, and Tie Cables basket controls are used in conjunction with both MPF and SMPF.

<sup>61</sup> In addition to a 40/10 GEA service, Openreach also currently also offers services at 40/2, 55/10 and 80/20.

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 therefore infer from BT's pricing decisions what an efficient allocation of costs would be.

- 2.78 Current GEA-FTTC rental charge differentials are likely explained by differences in retail customers' willingness to pay, rather than LRIC differentials, across the different speeds. We have therefore spread the total cost allocated to GEA-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.<sup>62</sup> This means that if BT were to maintain the existing ratio of GEA rental prices relative to our control on the GEA-FTTC 40/10 service, on the basis of our current volume forecasts, it would just recover costs (on a LRIC+ basis and including a return on capital). We believe this is the best available approximation of how BT may actually price its higher speed services.

**Table 2.2: Current price relativities of different GEA rental services**

	40/2	40/10	55/10	80/20
Annual prices (£ excluding VAT)	82.80	88.80	100.80	119.40
Price relative to 40/10	93%	100%	114%	134%

Source: Openreach's FTTC price list<sup>63</sup>

- 2.79 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 increment. If we were able to produce LRIC estimates for individual GEA 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 increment. We would then have a significant amount of common costs that we would need to allocate to different bandwidth GEA services.
- 2.80 Rather than trying to identify the LRICs of the individual GEA services and then reallocate the common costs, we believe it is appropriate for the purposes of this charge control to base the cost difference between bandwidths on the observed prices.

<sup>62</sup> We note that from 19 May 2017 Openreach set special offer prices for GEA-FTTC based on the achievement of volume commitments and the relativities of the different GEA services special offer prices differ 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.

<sup>63</sup> Openreach. Fibre to the Cabinet – Price List:

<https://www.openreach.co.uk/org/home/products/pricing/loadProductPriceDetails.do?data=0RlviN9gWGktCdDGaQ8lFObCimFDJOVDZEidKC%2F1wh1Z6rNZuinCs99NblKJZPD9hXYmijixH6wrCQm97GZMyQ%3D%3D> [accessed 6 February 2018].

2.81 As an alternative, we also considered fixing current rental charge differences to the 40/10 service in absolute value. We consider it is preferable to use the ratios (rather than the absolute differences) to determine the charge control level for the anchor because our estimates indicate that the absolute differences approach is more likely to lead to a situation where BT under-recovers its costs.<sup>64</sup> We consider that the ratios approach is therefore more consistent with our charge control objective of preserving the investment incentives faced by BT.

2.82 In terms of volumes, we have used our latest forecasts of GEA-FTTC rentals split by bandwidth to allocate common costs between these services as set out in Table 2.3.

**Table 2.3: Forecast volumes of different GEA rental services (national UK, millions of lines)<sup>65</sup>**

	40/2	40/10	55/10	80/20
2018/19	[<del>X</del> (1.00-1.25)	[<del>X</del> (3.25-3.50)	[<del>X</del> (2.75-3.00)	[<del>X</del> (3.00-3.25)
2019/20	[<del>X</del> (1.25-1.50)	[<del>X</del> (3.75-4.00)	[<del>X</del> (3.00-3.25)	[<del>X</del> (3.50-3.75)
2020/21	[<del>X</del> (1.50-1.75)	[<del>X</del> (4.50-4.75)	[<del>X</del> (3.25-3.50)	[<del>X</del> (4.00-4.50)

Source: Ofcom forecast

2.83 As set out in Annex 10, these forecasts reflect market developments since we carried out our forecast for the March consultation. In particular:

- Openreach has withdrawn its GEA-FTTC 18/2 service for new supply;
- TalkTalk has migrated its existing customers from GEA-FTTC 40/2 to GEA-FTTC 40/10 and now offers a 40/10 Mbit/s option as its entry-level SFBB service; and
- BT Consumer has migrated a considerable proportion of its customers from the GEA-FTTC 55/10 service to the GEA-FTTC 80/20 service.

2.84 In general, increasing the proportion of customers taking higher speed GEA-FTTC services lowers the allocation of common costs to the GEA 40/10 service. We consider that using the updated volume weights to allocate common costs between GEA services is necessary to provide a representative view of consumer preferences for bandwidth over the control period and note that this is consistent with various submissions we received from

<sup>64</sup> In the March 2017 WLA Consultation, we estimated that the difference between allocating on the basis of ratios versus the absolute difference for the GEA 40/10 service would be £0.27 per month in 2020/21. We compared the risks of under- or over- recovery under each approach:

- If we set the charge control for GEA 40/10 using our estimates based on current absolute charge differences while in reality charges follow the current ratios, BT would under-recover the costs allocated to fibre by circa £49.3m in 2020/21.
- However, if we set the charge control for GEA 40/10 based on current ratios while in reality charges follow the current absolute differences, BT would over-recover the costs allocated to fibre by circa £45.3m in 2020/21.

<sup>65</sup> We have made a number of redactions to this version of our statement, indicated by “[<del>X</del>]”. Depending on the commercial sensitivity of the information, we have provided alternative text indicated by “(alternative)”, randomised numbers indicated by “(~number)” and ranges indicated by “(x - y)”.

- stakeholders on the increasing demand for higher bandwidth services over the coming years.<sup>66</sup>
- 2.85 Investment decisions being made now are affected by expectations of demand, competition and regulation long into the future. We cannot prejudge what actions we will take in the future, as any pricing decisions in future reviews will be made in 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 GEA services.
- 2.86 In terms of the approach that we take to common cost recovery in a future review, our current thinking is that it is likely to be appropriate to update the existing control for efficiency and scale effects relevant to GEA volumes overall, but not to adjust the spot control to reflect future growth in margins and/or volumes of higher bandwidth services other than to reflect scale effects of demand across all GEA bandwidth services. Thus, under such an approach, we would not expect to reallocate cost away from the GEA 40/10 service to take account of any increase in the relative price of the higher bandwidth GEA services 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 this statement.
- 2.87 We are outlining 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 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 GEA 40/10 service subject to a charge control, any price differentials between GEA 40/10 and other bandwidth services would not be likely to 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 the GEA 40/10 service in future reviews.
- 2.88 Therefore, we have set the GEA 40/10 regulated price in this charge control period to maintain the current bandwidth gradient based on Openreach’s current prices, and note our current view that in future reviews it is unlikely to be appropriate to update the pricing gradient or volume forecasts for higher bandwidths (barring a significant change in expected circumstances).

---

<sup>66</sup> For example, on [§<].

### Recovery of common costs for non-rental services

- 2.89 In some cases we have used different cost standards for non-rental services where we consider it is appropriate to promote competition and encourage investment. As set out above, the circumstances in which we consider BT should be able to recover only the LRIC of a service are most likely to be where:
- a) the service is key to the competitive process, for example, because it supports customer switching between telecoms providers; or
  - b) we are setting charge differentials between substitute services using LRIC in order to give good incentives for cost minimisation.
- 2.90 As in the 2014 FAMR Statement and as proposed in our March consultation,<sup>67</sup> we have adopted the following approach to setting charge controls:
- a) For new connection services that are necessary for service take-up, we impose a FAC-based control. This approach allows 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.<sup>68</sup>
  - b) For migrations, we impose a LRIC-based control that reduces switching costs and brings competition benefits from more effective switching.
  - c) For ceases of an MPF 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. Where the LRIC of these charges is very low, such as in the case of soft ceases, we have set controls at zero. We have not however, imposed a LRIC control for hard cease activities which are not related to a specific customer activity and so do not represent a barrier to customer switching and, ultimately, to competition.
- 2.91 In some circumstances a flat cap set either in nominal or real terms is more appropriate than a modelled cost based control. We consider using an unmodelled price cap where it would not be possible for us to accurately model costs and we believe the current price is a reasonable proxy for the cost of the service.<sup>69</sup> We would also consider this option where we believe a flat cap is consistent with our expectation of the costs of the service (based on the evidence available and having regard to our objective of encouraging efficiency) and

---

<sup>67</sup> March 2017 WLA Consultation – Volume 2, paragraphs 3.13-3.15.

<sup>68</sup> Note, however, that in the case of FTTC New Connections (i.e. PCP Only Install and FTTC Start of Stopped Line) we treat them as migration services from copper to fibre services. See our preferred cost standard for migrations below.

<sup>69</sup> This may be because the service was charge controlled in the recent past, therefore its current price can be used as a reference point for the cost (e.g. MPF Standard Line Test was previously under a basket control and is now individually charge controlled, see Annex 23); or because there are other similar services whose costs are known and relatively close to the current price of the service that we wish to charge control (e.g. SFIs and TRCs as a reference point for Superfast Visit Assure charge, see Annex 23).

producing a model would be disproportionate. Examples of when we may face this situation are where:

- a) 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 known to be currently low;
- b) we have insufficient information to produce a modelled cost based control;
- c) current and forecast volumes are unknown or volatile; and
- d) prices have remained stable for a number of years.

2.92 In relevant instances we have also decided to introduce regulatory reporting requirements on BT to ensure that we can obtain sufficient cost information on these services going forward (see Annex 8 for details).

## Adjustments to the top-down cost data

2.93 We aim to set prices for copper services that provide incentives for both efficient investment in new networks and efficient migration of consumers between legacy and new networks, to promote sustainable competition and confer the greatest possible benefits on end-users (among other objectives).

2.94 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.

2.95 We have made three significant 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 and GEA services:

- the ongoing network adjustments;
- taking account of the value of copper sales; and
- operating expenditure (opex) adjustments for the level of faults on Openreach's network.

2.96 In addition, we have made a number of other adjustments to the actual historical cost data provided by BT to ensure that it reflects the expected future costs of the network. These adjustments are not linked to our general modelling approach and are detailed in Annex 12.

## Ongoing network adjustments

- 2.97 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 life being different from the actual asset life or services provided by an asset being unevenly split over its life.
- 2.98 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 nearly 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 MPF prices may delay consumer migration to services using fibre and may adversely impact other telecoms providers' incentives to deploy their own networks.
- 2.99 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 12, we have identified a small number of assets that require ongoing network adjustments.

## Value of copper sales

- 2.100 As discussed in Annex 22, we have assessed the value of the copper that we consider BT can realise by selling the copper it will recover from its E-side and D-side networks and within exchange buildings. 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.
- 2.101 In the 2014 FAMR Statement we did not consider it appropriate to capture the impact of the value of copper sales. We were concerned that including the copper sales 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 the impact that the copper sales value would have on our cost estimates was highly uncertain given it was not clear whether the value of copper sales would have a positive net value.<sup>70</sup>
- 2.102 After further consideration, in this review we are still using an anchor pricing approach but now believe this can be consistent with capturing the value of BT's copper sales. 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

---

<sup>70</sup> 2014 FAMR Statement Volume 2, paragraphs 3.59-3.66.



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 value of copper sales and expect that it will be a material future revenue stream.

- 2.103 Including the impact of the residual copper sales 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.
- 2.104 We consider this question as well as how to capture the impact of copper sales on charges in Annex 12 (including relevant stakeholder responses). 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 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**

- 2.105 In order to maintain its network, Openreach will incur both capex on acquiring and retaining physical assets and opex relating to the cost of operating and maintaining the physical assets. This includes the costs of repairing network faults when they arise.
- 2.106 In Section 4 of our 2018 QoS Statement, we discuss our analysis that shows Openreach has been underspending on capex versus the allowance we included in the previous charge control. 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 incurred higher opex than we expected from our previous forecasts. This suggests that Openreach may have been incurring additional opex in order to maintain equipment that is old and becoming heavily depreciated.
- 2.107 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 set are appropriate for the purposes of promoting efficiency (among other objectives), we have modelled the cost of an efficient well-maintained ongoing network.
- 2.108 As described in Annex 13, the capex we have allowed Openreach under our steady state ongoing network approach should be sufficient for it to maintain its network with a low level of faults. When modelling the opex required to deal with faults, we aim to set the fault rate at a level that takes into account the effects of Openreach's preventative maintenance programme and underlying trends in technology over the forecast period. We consider that Openreach's current plans give us a way to proxy this level of faults and

in our analysis have therefore used the fault level that Openreach believes it will reach after the completion of its preventative maintenance programme.<sup>71</sup>

---

<sup>71</sup> As set out in Annex 13, we believe that Openreach will be able to reduce its fault rates by [3<] (10-13%).

## 3. Charge control design

- 3.1 In this Section we set out the design of our charge controls. Under each of the following topics, we set out our consultation proposals, a summary of stakeholder responses and details of our reasoning and decisions on:
- **specification of the MPF and GEA 40/10 rental charge controls:** we set out details of the MPF and GEA 40/10 rental services we have decided to charge control;
  - **duration of the MPF and GEA 40/10 charge controls:** we have set the charge controls for a three-year period from 1 April 2018;
  - **speed of aligning charges with cost:** we have 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;
  - **our principles for basket design:** we set out the principles we have been guided by in designing charge control baskets; and
  - **weighting price changes and consideration of additional controls within baskets:** we have decided to apply prior year revenue weights with individual sub-caps for the basket controls.

### Specification of the MPF and GEA 40/10 rental service controls

#### MPF rental service specification

- 3.2 BT offers MPF rental services at different service maintenance levels (SMLs). The charge control was previously applied to MPF SML2, which was the variant of MPF most used by telecoms providers and the default service level when we set the charge control in 2014.<sup>72</sup> Telecoms providers could pay for higher service levels if they chose to do so (SML3 and SML4).
- 3.3 In 2015, BT introduced a further variant of MPF Rental called SML1. This service was priced lower than the SML2 service subject to the charge control and has a two-day repair time target compared to SML2 which has a one-day target.<sup>73,74</sup> 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.<sup>75</sup>

---

<sup>72</sup> 2014 FAMR Statement Volume 1, paragraph 9.6.

<sup>73</sup> SML1 and SML2 also differ in that SML1 only requires repairs Monday to Friday, whereas SML2 additionally includes Saturday (for further details see Openreach, Fact Sheet: Service Maintenance Levels.

[https://www.openreach.co.uk/org/home/products/serviceproducts/serviceharmonisation/serviceharmonisation/downloads/SML\\_fact\\_sheet\\_web\\_vers\\_phme\\_61163\\_2011\\_09.pdf](https://www.openreach.co.uk/org/home/products/serviceproducts/serviceharmonisation/serviceharmonisation/downloads/SML_fact_sheet_web_vers_phme_61163_2011_09.pdf) [accessed 26 January 2018]).

<sup>74</sup> At 24 January 2018, SML1 was priced at £84.38 while SML2 cost £87.65 (Source: Openreach price list).

<sup>75</sup> 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](https://www.ofcom.org.uk/data/assets/pdf_file/0019/71524/quality-of-service-wlr-mpf.pdf).

- 3.4 In our March consultation, we proposed to impose a charge control on MPF SML1. We also proposed that it was not necessary to impose a charge control on MPF SML2 in addition to MPF SML1.
- 3.5 No stakeholder disagreed with our proposals<sup>76</sup> and we have decided to impose a charge control on SML1. We consider a charge control on SML1 will have greater benefits for downstream competition given the significant move to SML1 by telecoms providers.<sup>77</sup>
- 3.6 In addition, we have decided not to impose a charge control on SML2. We continue to consider this would be disproportionate as the fact that significant volumes have migrated to MPF SML1 suggests that this service is likely to be sufficient for telecoms providers in most cases. In addition, we expect that SML1 will act as a constraint on SML2 prices as, should BT significantly increase the price of SML2, telecoms providers are likely to switch to buying more SML1 instead.

### GEA 40/10 rental service specification

- 3.7 As set out in Volume 1 we have decided to impose a charge control on GEA 40/10 rentals for the first time. Section 9 of Volume 1 sets out why we have decided to impose a charge control on GEA 40/10 rentals and associated ancillary services, while allowing BT continued pricing flexibility on other bandwidth variants for the charge control period.

#### Charge control on GEA-FTTP 40/10 rentals

- 3.8 Our decision to charge control GEA 40/10 rental services relates to services offered over BT's FTTC network. However, GEA services can be provided either using GEA-FTTC in conjunction with copper, or using BT's FTTP network. In Volume 1, Section 9 we set out our reasoning and decision to require BT to align its rental charge for its GEA-FTTP 40/10 service over full-fibre with its equivalent GEA-FTTC rental charge.<sup>78</sup> This requirement does not apply for premises for which BT also offers a 40/10 service using FTTC. We consider this strikes an appropriate balance between addressing the risk that consumers in FTTP-only areas are subject to excessive prices and our approach of allowing pricing flexibility at higher bandwidths and for full-fibre services to promote investment.

---

<sup>76</sup> The only stakeholder response we had on this topic was Openreach, which did not disagree with our proposals (Openreach response to the March 2017 WLA Consultation – Volume 2, paragraph 91).

<sup>77</sup> By way of further background, on 31 May 2017 Openreach made a commitment to reduce its charge for MPF SML1 to £84.38, effective from 1 July 2017 and until the start of the charge control period for this market review. This was in response to our consultation of 31 March 2017 on a proposal to use our direction making powers in the SMP conditions imposed on BT in the Fixed Access Market Reviews to specify the fair and reasonable charge of not more than £84.38 for MPF SML1 in the period prior to the introduction of new charge controls in 2018. Please see: <https://www.ofcom.org.uk/consultations-and-statements/category-3/mpf-rental-at-service-maintenance-level-1>.

<sup>78</sup> See also the discussion on GEA 40/10 rentals with Fibre Voice Access and transition rentals in paragraphs 3.9 – 3.13 below.

### GEA 40/10 rentals with Fibre Voice Access and transition rentals

- 3.9 Where GEA services are provided using FTTP, voice services are provided either via the Fibre Voice Access (FVA) service along with GEA-FTTP or, in some cases, the GEA-FTTP Transition service plus an underlying copper service (WLR or MPF).
- 3.10 The FVA service in combination with GEA-FTTP 40/10 offers an equivalent service to GEA-FTTC 40/10 with WLR or MPF. FTTP rental volumes are currently low, but we expect volumes to grow over the course of the charge control period.<sup>79</sup> We consider equivalent services subject to a charge control provided using different networks and technologies should have the same charges. We have therefore decided to require the charges between the FVA service provided in combination with GEA-FTTP 40/10 rental services and the sum of MPF and GEA 40/10 FTTC rentals to be aligned in areas where the GEA-FTTC 40/10 service is not available (consistent with the approach outlined in paragraph 3.8 above).<sup>80</sup>
- 3.11 In addition, it is not possible to deliver FVA in all areas where GEA-FTTP 40/10 has been deployed. In those cases, as an interim alternative, BT offers a GEA-FTTP 40/10 transition service<sup>81</sup> which, like GEA-FTTC 40/10 services, is only available in conjunction with an existing WLR or MPF service.<sup>82</sup>
- 3.12 The annual rental for the GEA-FTTP 40/10 transition service and GEA-FTTC 40/10 service is currently aligned at £88.80. Given the equivalence of the two services and our technology neutral approach, we have decided that, where BT only offers FTTP services, these charges should remain aligned (at the level of the GEA 40/10 charge control) over the course of the charge control period.
- 3.13 BT also offers a GEA-FTTP 40/10 “data product variant”, a data only service, i.e. without the voice service included. We have decided not to impose a charge control on GEA-FTTP 40/10 data variants because we consider the full-fibre service rentals set out above (which are combined with voice) should impose a sufficient constraint on prices of the data variants.

---

<sup>79</sup> Openreach response dated 5 January 2018 to question 2 of the 44<sup>th</sup> s.135 notice.

<sup>80</sup> The case of FVA alone is addressed in the 2017 NMR Statement, paragraph 4.67. In particular, we included ATA (analogue telephony adaptor) enabled FTTP connections within the WFAEL market definition. As we have decided to impose a charge control on MPF SML1 rental services, we use the sum of MPF SML1 with GEA-FTTC 40/10 rental charges as the benchmark for the sum of FVA with GEA-FTTP 40/10.

<sup>81</sup> BT’s price list, “Transition Product” Variants at

<https://www.openreach.co.uk/org/home/products/pricing/loadProductPriceDetails.do?data=SjLGnN8O1mzybN7g39pZiNKvrleCIYZjBLZ4w%2FibaalZ6rNZujnCs99NbIKJZPD9hXYmiiixH6wrCQm97GZMyQ%3D%3D> [accessed 24 January 2018].

<sup>82</sup> The FTTP transition service delivers data over fibre, while voice is provided over copper.

## Duration of the MPF and GEA 40/10 charge controls

### Our proposals and stakeholder responses

- 3.14 In the March consultation, we proposed having a three-year duration for the charge controls. This length of this charge control is consistent with the previous charge control and aligns with the market review cycle specified in the Framework Directive.<sup>83</sup>
- 3.15 Openreach agreed with our proposed duration for the MPF and GEA charge controls.<sup>84</sup> No other respondent commented on this issue.

### Our reasoning and decisions

- 3.16 It is important when determining the duration of the charge controls to consider how best to promote efficiency, as set out under section 88 of the Act. We have considered what duration of charge control strikes the appropriate balance between dynamic and static efficiency.
- 3.17 All other things being equal, a longer charge control period creates stronger incentives for dynamic efficiency compared to a shorter period. It would allow BT to keep the additional profit from innovation and cost reduction for longer. However, the re-setting of new charge controls allows us to ensure that allocative efficiency objectives are met by bringing the level of charges into line with costs.
- 3.18 Therefore, price cap regulation trades-off some allocative efficiency in return for greater dynamic efficiency. The longer the duration of the cap, the greater the incentive to reduce costs, but the higher the potential cost of lost allocative efficiency as prices can be out of line with costs for longer and perhaps by a greater amount. Shorter charge controls thus tend to give more weight to allocative efficiency, since prices have less scope to diverge from costs.
- 3.19 We consider that a shorter time period would not be appropriate. A shorter period would reduce incentives on BT to innovate and make efficient investments and this could reduce dynamic efficiency. A longer control period also allows other telecoms providers using BT's infrastructure to better plan their own investments in capital and business processes. It would also allow more certainty on the regulatory environment for telecoms providers planning to make their own network infrastructure investment.
- 3.20 Conversely, given the extent of supply-side changes anticipated over this market review period (e.g. further new network investment, investment in systems and processes such as quality of service and the implementation of 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

---

<sup>83</sup> Article 16 of the Framework Directive 2002/21/EC, as amended by Directive 2009/140/EC.

<sup>84</sup> Openreach response to the March 2017 WLA Consultation – Volume 2, page 6.

investment incentives. This forecast uncertainty would be mitigated by adopting a shorter charge control period.

- 3.21 We continue to consider that a three-year charge control duration strikes the right balance between forecast uncertainty and providing regulatory stability for stakeholders. We have therefore decided the MPF and GEA charge controls set out in this statement will be in place for three years.

## Speed of aligning charges with cost

### Our proposals

- 3.22 In our March consultation, we proposed to align MPF and GEA 40/10 rental prices with costs in 2019/20, meaning we would use a one-year glidepath. We would then keep prices at our estimate of costs for the remainder of the charge control.
- 3.23 In our September consultation, we explained the basis of our proposals relating to the choice of glidepath for MPF rentals. We provided further details on why we considered that using a one-year glidepath to bring charges into line with costs was consistent with the framework we had established in the 2016 BCMR Statement and that the results of our Cost Allocation Review (CAR) would not automatically lead to a starting charge adjustment (SCA).

### Stakeholder responses

- 3.24 In response to our March consultation, Openreach agreed with our proposed use of glidepaths to align prices with costs, but disagreed with our proposed speed of adjustment. It believed that our proposed glidepath was effectively introducing an SCA that was not supported by the degree of price misalignment.
- 3.25 Openreach argued that our proposal for aligning MPF prices with cost was a departure from past regulatory practice away from promoting productive and dynamic efficiency towards allocative efficiency. Openreach also disagreed that the incentive properties for glidepaths were less important for services that were subject to a charge control for the first time (i.e. GEA 40/10).
- 3.26 Openreach argued the incentives to encourage and reward productive efficiency applied to GEA services as much as any other service. Additionally, it considered that we should give greater weight to dynamic efficiency, in particular encouraging investment and the development of new services. Openreach noted that its investment in GEA services has suffered losses over a number of years and so margins in line with the cost of capital do not provide a competitive benchmark for a new or growing service. It considered that we should take these past losses into account and ensure that any accelerated glidepath is consistent with the fair bet having played out.<sup>85</sup> In response to the September consultation,

---

<sup>85</sup> Openreach response to the March 2017 WLA Consultation – Volume 2, paragraphs 58 to 63.

- Openreach reiterated its argument that we should not use a ‘truncated’ one-year glidepath.<sup>86</sup>
- 3.27 [3] believed that using a glidepath that is as long as the market review period should be the starting point. However, it did not consider that a one-year glidepath would be detrimental.<sup>87</sup>
- 3.28 CityFibre considered that our proposals on a GEA 40/10 charge control were too aggressive, including the speed by which we align prices with costs via our proposed glidepath.<sup>88</sup>
- 3.29 Virgin Media believed that the steeper the glidepath was, the worse the potential impact on incentives to invest in new networks. It argued that we should take more account of the impact of the charge control on its incentives to invest.<sup>89</sup>
- 3.30 Vodafone did not comment on the glidepath for the GEA 40/10 charge control beyond noting that it did not support the timing of this charge control and that GEA prices should be ‘reset’ as early as possible to avoid consumers being over-charged. Vodafone agreed, however, with using a one-year glidepath for the MPF rental charge control.<sup>90</sup>
- 3.31 TalkTalk and Sky both considered we should make SCAs. TalkTalk argued that as we are regulating the GEA 40/10 service for the first time we should put an SCA in place. TalkTalk acknowledged our argument that we may use a glidepath to allow the fair bet to play out and noted that our proposed glidepath would allow a 12% return. It considered that if we found that the return was above 12%, we should put an SCA in place to ensure that Openreach earns no more than a 12% return.<sup>91</sup>
- 3.32 In response to our March consultation, TalkTalk and Sky argued that we should be making an SCA to MPF prices to reflect the cost reattributions that resulted from the CAR.<sup>92</sup> In response to the clarifications that we provided in the September consultation, TalkTalk made the following additional points:
- Our proposals were not consistent with the approach taken in the 2016 BCMR Statement on SCA because we had not distinguished between reattributions in regulated and non-regulated markets (which warrant an SCA) and reattributions between regulated markets (which do not warrant an SCA).
  - We ignored the allocative efficiency benefits of an SCA.
  - We should not be focussed on whether prices and costs are significantly misaligned when considering whether to impose an SCA, because ‘significant’ misalignment is an

---

<sup>86</sup> Openreach response to the September 2017 WLA Consultation, paragraphs 165-166.

<sup>87</sup> [3] response to the March 2017 WLA Consultation, page 5.

<sup>88</sup> CityFibre response to the March 2017 WLA Consultation, section 8.2.

<sup>89</sup> Virgin Media response to the March 2017 WLA Consultation, paragraphs 2 and 147-148.

<sup>90</sup> Vodafone response to the March 2017 WLA Consultation, paragraph 3.37 and page 61.

<sup>91</sup> TalkTalk response to the March 2017 WLA Consultation, section 7.4.

<sup>92</sup> TalkTalk response to the March 2017 WLA Consultation, section 8.0.



arbitrary test and it is important to understand the reasons for the misalignment in addition to whether there is a misalignment or not.<sup>93</sup>

- 3.33 TalkTalk also argued that we should not be using the DSAC<sup>94</sup> cost measure to test whether prices distort price signals and risk economic inefficiency. Rather, TalkTalk argued that we should use a measure of cost such as FAC+X%.<sup>95</sup>
- 3.34 In a follow-up letter, TalkTalk continued to argue that an SCA was appropriate and argued that lower prices for MPF would not worsen efficient competitive investment signals. It stated that the viability of full-fibre investments by other telecoms providers was dependent on having a scale existing customer base to migrate to the new network. It pointed to the announcements, subsequent to our March consultation, by CityFibre/Vodafone, Openreach and Gigaclear to invest in full-fibre, as evidence that lower prices will not reduce investment incentives. It also argued that lower MPF prices reduce legacy profits and so stimulate demand.<sup>96</sup>
- 3.35 In response to our September consultation, Sky argued that by relying on whether prices are close to costs in determining whether an SCA is appropriate we are violating the fair bet principle. Sky considered that because of cost misallocations in the 2014 FAMR charge controls, prices had been set inappropriately high. If when these misallocations are removed, prices are below costs, it argued that this just reflects the fair bet in action (i.e. BT bears the losses if its costs are higher than Ofcom's forecast of prices at the end of the charge control period).
- 3.36 Sky also argued that because the cost reallocations are to unregulated markets, there is no risk of cost under-recovery when making an SCA. Sky believed that there is a material cost reallocation based on the evidence we presented in the September consultation and so materiality would not be a valid reason for ignoring the impact of CAR.<sup>97</sup>

## Our reasoning and decisions

### Our framework for deciding at what speed to adjust prices

- 3.37 There are three broad options for closing any gap between prices and forecast unit costs within a charge control:
- **glidepath only:** charges gradually reduce over time determined by the X in the CPI-X control;
  - **one-off SCA:** charges are adjusted to cost at the beginning of the control period. Under this approach, the required annual change in prices in subsequent years will only be as a result of changes in our forecast of costs over time; and

---

<sup>93</sup> TalkTalk response to the September 2017 WLA Consultation, section 3.6.2.

<sup>94</sup> The Distributed Stand-Alone Cost (DSAC) for a network component is equal to the LRIC plus an allocation of the stand-alone cost (SAC) of a broad increment of services. The SAC is the cost of providing a service on its own (i.e. on a stand-alone basis).

<sup>95</sup> TalkTalk response to the September 2017 WLA Consultation, section 3.6.3.

<sup>96</sup> TalkTalk letter dated 30 November 2017 titled WLA charges [addressed to Caroline Longman of Ofcom], pages 1-3.

<sup>97</sup> Sky response to the September 2017 WLA Consultation, paragraphs 3.4-3.13.

- **combination of one-off SCA and a glide path:** charges are adjusted at the start of the control period to bring them closer to cost, but some of the gap between charges and cost is closed in subsequent years of the charge control by the X.
- 3.38 As set out in the March and September consultations, when adjusting prices to our estimate of costs we have a general preference for using glidepaths, potentially with some limited SCAs. We prefer adjusting prices gradually for two main reasons that fit with our overall objectives when setting a charge control as set out in Section 2:
- **To promote productive efficiency:** using a glidepath allows the regulated firm to keep the benefits of unit cost reductions, beyond those forecast when the charge control was set, for longer than if we use an SCA. Consequently, the use of a glide path gives the regulated firm better incentives to pursue improvements in productive efficiency and/or grow volumes than an SCA.
  - **To promote dynamic efficiency:** a glidepath avoids discontinuities in charges over time and leads to a more stable and predictable background against which investment and other decisions may be taken. This is a particularly important consideration when, as with our current strategy, we are seeking to provide the right conditions to promote competitive infrastructure investment.
- 3.39 Although the use of glidepaths can provide stronger incentives for productive and dynamic efficiency improvements than SCAs, it does so by allowing charges to diverge from costs for longer. One of our key concerns when putting a charge control in place is protecting citizens and consumers from a firm with SMP levying excessively high charges. In circumstances where charges exceed costs, the use of a glidepath to close the gap over the control period would need to be weighed against requiring customers of the regulated services to pay charges that are higher than the cost to the firm of providing those services.
- 3.40 Allowing charges to remain above cost for an extended period can lead to a reduction in short-term allocative efficiency. For a particular charge control, the appropriate balance between these economic efficiency considerations (and so whether we should use a glidepath or SCA) is a matter of regulatory judgement. When reapplying a charge control, we have historically placed more weight on productive and dynamic efficiency improvements because they are likely to generate greater benefits to consumers over time. However, as discussed further below, there will be some instances in which an SCA is likely to be appropriate when reapplying a charge control.
- 3.41 When charge controlling a service for the first time, we are typically less concerned about the productive efficiency considerations set out above. As no charge control had been in place we will not be removing the incentive for Openreach to outperform our forecast of efficiency. By contrast, BT could be enjoying excessive and persistent returns as a result of its SMP that we would wish to remove.
- 3.42 Openreach was concerned that by not allowing a glidepath over the entire period of the charge control, we are undermining its incentives to make efficient investments. We agree that care must be taken because high profits can result not only from exploitation of SMP but also by virtue of innovation, either in new products or savings from new technologies,

and we have considered these points when deciding on the appropriate level of the GEA 40/10 charge control discussed below.

*When we might use starting charge adjustments for currently charge controlled services*

- 3.43 In the September consultation, we set out the circumstances in which we may exercise our judgement to use an SCA. As we explained, these were the same criteria used in the 2016 LLCC.<sup>98</sup> We explained that there are two circumstances in which the balance of efficiency considerations may imply that an SCA is appropriate:
- **distorted pricing signals:** where the risk to economic efficiency or competition from distorted pricing signals is particularly significant; and
  - **significant price/cost differential:** where prices are significantly above or below cost for reasons other than efficiency or volume growth.
- 3.44 In the 2016 LLCC, our view was that pricing signals could be distorted if prices were above DSAC or below Distributed Long Run Incremental Costs (DLRIC). Although prices were high in the 2016 LLCC, we did not find they were above DSAC and therefore our judgement was that an SCA was not required to correct for distorted pricing signals. We did, however, consider that SCAs were appropriate to correct for a significant price/cost differential because when assessing the level of returns we found that:
- returns for the services relevant to the charge control had been exceptionally and persistently high; and
  - the high rates of return did not appear to be primarily due to outperformance by BT against efficiency and volume assumptions as used when setting the charge control for the previous period.
- 3.45 Both TalkTalk and Sky argued that we should also take into account the reasons for prices being different from costs and cited our position in the 2016 LLCC where we stated we would treat reallocations between regulated services differently from reallocations between regulated and unregulated services.
- 3.46 TalkTalk is correct that we made a distinction in the 2016 LLCC between costs that are reattributed to other charge controlled markets and those that are reattributed to unregulated markets. In particular, we were concerned about the potential for under-recovery when removing costs using an SCA that had not yet been included in the charge control for the market these costs were being allocated to.<sup>99</sup> However, this consideration was relevant in the context of the size of the SCA we would use in the 2016 LLCC rather than to the question of whether an SCA was necessary. We were explicit in the 2016 LLCC that we did not consider it was appropriate to decompose the reasons for BT's excess returns when deciding on whether an SCA was necessary.<sup>100</sup> We have applied the same principle in this case and therefore do not consider it is necessary to interrogate the reasons for BT's returns on MPF services. We believe the framework that we used to

---

<sup>98</sup> April 2016 BCMR Statement, Volume II.

<sup>99</sup> April 2016 BCMR Statement, Volume II, paragraph 7.80.

<sup>100</sup> April 2016 BCMR Statement, Volume II, paragraph 4.86.

determine whether to use an SCA in the 2016 LLCC is the appropriate framework to use for the 2018 WLA charge control.

- 3.47 In relation to TalkTalk’s suggestion that a mark-up on FAC is a more appropriate test for distorted pricing signals than DSAC, we note that the use of a FAC+X% approach was considered in the 2016 LLCC and considered to be inferior to DSAC.<sup>101</sup> However, as discussed below, for MPF rentals there is not a significant misalignment between prices and costs meaning the distorted pricing signals test is not relevant. We have therefore not given further consideration to the appropriate level for conducting this test in this review.

### **The glidepath for GEA 40/10 rentals**

- 3.48 As set out above, where we are placing a charge control on a service for the first time, we do not believe that the arguments for using a glidepath are as strong as when re-imposing a charge control. Consequently, there may be a case for an SCA adjustment to GEA 40/10 charges in order to reduce prices to cost immediately. However, as set out in our March consultation, in our judgement there are other factors to consider that mean a glidepath better achieves our goal of incentivising fibre investment (both by BT and other telecoms providers).

#### *Using a glidepath to incentivise investment*

- 3.49 In our March consultation, we argued that the use of a glidepath may incentivise investment in full-fibre networks in two ways:
- i) by ensuring that the fair bet is met on BT’s FTTC investment; and
  - ii) by providing a more stable pricing environment for competitive infrastructure investment.
- 3.50 In Volume 1, Section 9 and Annex 6, we discuss our assessment of 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.
- 3.51 The longer we allow BT to price above our estimate of the cost of provision of GEA 40/10 services, the greater BT’s return on its investment and the more likely the fair bet will have been met. However, as set out in Volume 1, determining when the fair bet has been met and the level of return consistent with the fair bet is a matter of regulatory judgement.
- 3.52 In our March consultation, we calculated that a one-year glidepath would lead to BT earning an internal rate of return (IRR) on its FTTC investment of just under 12% (11.8%). We noted that higher returns provide an indication that the fair bet has been met, but it is not determinative.

---

<sup>101</sup> April 2016 BCMR Statement, Volume II, paragraphs 4.103-4.104.

- 3.53 It was not our position in the consultation that a 12% IRR meant that the fair bet had been met. We also noted that it was important that we take account of the asymmetric risk of regulatory error and therefore to err on the side of caution. We therefore do not agree with TalkTalk that we should necessarily perform an SCA to bring the IRR down to 12% if it is above this level. We now estimate that with a one-year adjusted glidepath the IRR would be around 15% compared to an IRR of [X] if we use an SCA. Given the level of the IRRs are much higher than in our March consultation, we now believe that using an SCA on 40/10 GEA prices might be consistent with the fair bet being met.
- 3.54 As part of our assessment on whether to use an SCA, we also consider it is important to focus on encouraging sustainable competition at the network level, since this has the potential to generate significant dynamic efficiency benefits. In considering whether an SCA is appropriate in this instance, we have placed considerable weight on the likely impact on competitive investment.
- 3.55 Virgin Media and CityFibre both noted the importance of the GEA 40/10 rental price when making network infrastructure investment decisions. We have therefore considered the potential for an SCA to have an adverse impact on the investment decisions of BT's competitors. A particularly sharp price adjustment may impact on investments that have been made and lead to uncertainty about the regulatory environment, which may result in a reluctance to continue investing in these or other projects.
- 3.56 Given sizable investments in network infrastructure have recently been announced, we would not want to take action now that would jeopardise these investments and the benefits they will bring to consumers. We are of the view that not using an SCA in this case better protects other telecoms providers currently engaged in network infrastructure investment from price shocks and provides a more stable regulatory environment.

*Decision on the glidepath for GEA 40/10 rentals*

- 3.57 Although we recognise the need to provide a stable platform for investment decisions, we also recognise the considerable additional cost imposed on Openreach's wholesale customers by not immediately reducing prices to cost via the use of an SCA.<sup>102</sup> In addition, we are aware that this charge control is being introduced a year later than the original timetable which means Openreach has had pricing flexibility for longer than would otherwise have been the case.
- 3.58 It is our judgement that the path of prices for the GEA 40/10 charge control that best meets our objectives is 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 with a glidepath to cost over three years. Although a glidepath may not be necessary for Openreach to achieve the fair bet on its FTTC investment, we still consider this glidepath provides the right balance between protection for Openreach's customers from the risk of high prices and preserving other

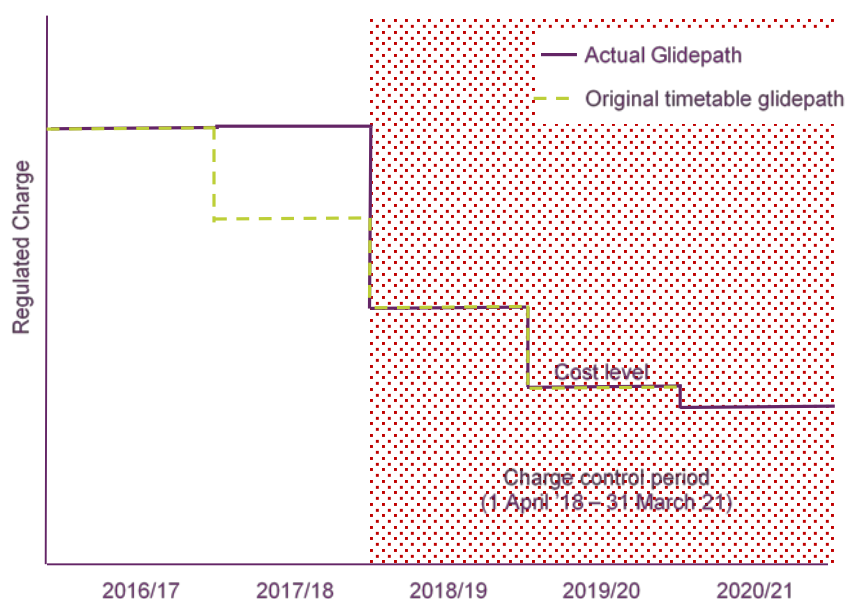
---

<sup>102</sup> Compared to our preferred approach of adjusting prices on 1 April 2019 to the level prices would have been at if the control commenced on 1 April 2017., using a one-year glide path would have given Openreach approximately £20m additional revenue.

telecoms providers’ incentives to invest in competing infrastructure. Additionally, as this glidepath moves us onto the path of prices we would have been on if the control had commenced on 1 April 2017, we believe that it provides a stable regulatory environment because it is consistent with our past practice when applying glidepaths (i.e. it mimics a glidepath that lasts for the entire control period if that control period started on 1 April 2017).

3.59 We set out below a stylised representation of our glidepath and how it relates to our original timetable in Figure 3.1 below.

**Figure 3.1: Stylised representation of our glidepath approach**



Source: Ofcom

### The glidepath for MPF rentals

3.60 In past MPF charge controls, we have used glidepaths to move charges from their current level to our estimate of cost. As MPF services are currently subject to a charge control, MPF prices are therefore subject to the dynamic and productive efficiency arguments set out above. Our starting point is therefore that we should use a glidepath. In our September consultation, we did not consider that there was a significant misalignment between prices and costs that would warrant an SCA. Indeed, our estimate of FAC for 2018/19 was above the current price for MPF rentals.

3.61 Our updated estimate of FAC for MPF rentals in 2018/19 is still above current prices for MPF rentals. The difference between the costs reported in BT’s RFS and the current price also suggests that we are not observing exceptionally high returns and therefore no SCA is required either to correct for pricing distortions or significant returns that are not caused by outperformance against historical efficiency or volume assumptions.

3.62 As prices are currently below costs, if we were to make an SCA on the basis that TalkTalk and Sky are arguing, it would mean reducing charges further below our estimate of cost

and then increasing prices back up to the cost level at some point during the remainder of the charge control. We are concerned that this path of prices would lead to pricing discontinuity.

- 3.63 We do not agree with Sky that not making an SCA would undermine the principle of the fair bet. The fair bet does not require us to remove particular costs using an SCA, rather it would require us to treat this type of cost reallocation consistently between allocation in and out of the market. Due to the inherent uncertainty when forecasting (including cost reattributions), in any modelling exercise our forecasts will differ from what actually occurs, which will mean the price in the final year of a charge control may be above or below our new cost estimate. However, we would not expect to make an SCA for the differences between our forecasts and outturn reality unless the conditions discussed above are met. It is not our position that the reallocation of costs as a result of the CAR was done as a result of BT deliberately misattributing costs. Rather, the CAR reattributions reflect our view of how costs should be attributed for the purpose of setting charge controls on a forward-looking basis.

*The size of the CAR reattributions*

- 3.64 In the September consultation, we explained why the impact of the CAR on the WLA market was smaller than in the BCMR context. This was not, as suggested by Sky, because we were arguing that we should not make an SCA on materiality grounds. Our position in the March consultation was that the outcome of the CAR was not a determinative factor in deciding whether an SCA was necessary for the WLA charge controls. However, given that the CAR did move a significant amount of cost out of the WLA market, we believed it was helpful to explain why it does not follow that the current WLA prices would have been much lower if they had been calculated on a “post-CAR” basis.
- 3.65 The attribution rules reflected in the current MPF prices are not the same as those reviewed as part of the CAR. The current prices were set in the 2014 FAMR based on cost data from BT’s 2011/12 RFS, while the CAR reviewed the cost attribution approaches used by BT in its 2013/14 and 2014/15 RFS. In the intervening period, BT made significant changes to its cost attribution approach.
- 3.66 The most significant set of changes were made by BT in 2012/13. The impact of these changes on the cost attribution to each market is set out in a report published by BT on 3 October 2013.<sup>103</sup> The impact of these changes was, amongst other things, to increase the costs attributed to Fixed Access markets and reduce the costs attributed to Leased Lines markets. In the 2014 FAMR statement, we explained that we were concerned that the changes appeared to be unbalanced in BT’s favour. We therefore did not update our MPF cost forecasts to reflect the 2012/13 RFS and did not reflect the increased cost attribution in the WLA charge controls.

---

<sup>103</sup> BT, 2013. *Report requested by Ofcom describing certain changes to the Accounting Documents for the year ended 31 March 2013 and illustrating the resulting differences to the Current Cost Financial Statements had those changes not applied.*

- 3.67 However, the 2016 CAR reviewed the way BT attributed its costs in its 2013/14 and 2014/15 RFS, so did take account of the new rules introduced by BT in 2012/13 and subsequent years.
- 3.68 Therefore, it is not possible to consider the impact of the CAR adjustment on MPF costs without also considering the impact of BT’s adjustments since 2011/12 in the opposite direction. Indeed, a significant proportion of the total of the adjustments that followed the CAR had the effect of reversing changes made by BT after 2011/12. For example, as explained in the 2016 BCMR Statement, one of the most significant adjustments made following the CAR related to BT’s use of an attribution rule based on pay and return on assets. As illustrated by the table below, BT applied this rule to more cost categories and to a significantly higher level of costs in 2014/15 than it did in 2011/12. Therefore, even if it was possible and appropriate to apply the CAR adjustments to the 2011/12 costs, the adjustment would have been much smaller than it was in 2016.

**Table 3.2: Total costs subject to a pay and return on assets attribution rule in 2011/12 and 2014/15 (£m nominal)<sup>104</sup>**

Cost category	2011/12	2014/15
Corporate costs	[<del>X</del> (400-450)]	[<del>X</del> (500-1000)]
TSO support costs	-	[<del>X</del> (50-100)]
Openreach overheads	-	[<del>X</del> (50-100)]
BT Wholesale software	-	[<del>X</del> (10-50)]
Openreach software	-	[<del>X</del> (50-100)]
<b>Total</b>	[<del>X</del> (400-450)]	[<del>X</del> (500-1000)]

Source: Ofcom estimates from the 2016 BCMR Statement, Annex 28, Table 2.3

- 3.69 While it is difficult to predict what the current MPF prices might have been had they been set on a basis that reflected the findings of the CAR, our finding (set out above) is that the current prices (based on forecast costs calculated on a pre-CAR basis) indicate that the CAR

<sup>104</sup> See [https://www.ofcom.org.uk/data/assets/pdf\\_file/0020/46622/final-annex-28.pdf](https://www.ofcom.org.uk/data/assets/pdf_file/0020/46622/final-annex-28.pdf).



adjustments were offset by the effects of other adjustments to attribution rules since 2011/12. This at least partly explains why we do not observe such a large difference between prices and our estimate of costs. Although in some cases the source of the costs being allocated in and out of the WLA market will be different, as set out in our framework above, we do not consider the source of the cost to be relevant when deciding whether we should make an SCA.

#### *Decision on the glidepath for MPF rentals*

3.70 Although we consider a glidepath is appropriate for the MPF rental service, we continue to believe that BT should not unnecessarily benefit or be penalised for the delay in the start of the new control. As part of the lacuna arrangement, Openreach agreed to reduce the MPF SML1 rental price to the level it would have been at if the charge control had been in place on 1 April 2017.<sup>105</sup> Therefore, a glidepath that is consistent with a charge control being in place from 1 April 2017 is consistent with current pricing. As with the GEA 40/10 rental service, we will use a one-year glidepath and move MPF rental prices onto the path of prices that they would have been on if the charge control had not been delayed.

## Principles for basket design

3.71 In our March consultation we set out the principles that have guided us in designing the charge control baskets. We have not received any responses from stakeholders on our proposals and our reasoning and decisions on principles for basket design have not changed since our consultation. In the remainder of this section we set out our reasoning and decisions relating to these principles.

### Our principles

3.72 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 the changes in the charges of all the services in the basket weighted by revenue.

3.73 In designing the 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.

---

<sup>105</sup> The new price for MPF SML1 was based on our estimate of the nominal price in the first year of a glidepath from BT's current price (£85.29) to our proposed charge control nominal estimate for MPF SML1 in 2019/20 (£82.28) as at March 2017 (note the reduced price of £84.38 came into effect on 1 July 2017). See 31 May 2017 MPF Lacuna Arrangement – [https://www.ofcom.org.uk/\\_data/assets/pdf\\_file/0020/102476/Update-MPF-Rental-at-Service-Maintenance-Level-1.pdf](https://www.ofcom.org.uk/_data/assets/pdf_file/0020/102476/Update-MPF-Rental-at-Service-Maintenance-Level-1.pdf).

- 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 in a basket to align to the differential in incremental costs, we would need an additional control within the basket.<sup>106</sup>

### Advantages of broad baskets

- 3.74 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.<sup>107</sup>
- 3.75 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.
- 3.76 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

- 3.77 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

---

<sup>106</sup> 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*, paragraph 4.18, [https://www.ofcom.org.uk/data/assets/pdf\\_file/0030/58575/llu\\_wlr\\_cc\\_2014.pdf](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 Section 2.

<sup>107</sup> 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.

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

- 3.78 In some cases, 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.
- 3.79 Alternatively, or in addition, sub-caps or inertia clauses on particular services within a basket can be used to address these competition concerns. In this way, the potential harm to competition can be mitigated while, at the same time, retaining the pricing flexibility benefits of basket controls.
- 3.80 Whether a broad basket with sub-caps is preferable to a larger number of smaller baskets will depend on the characteristics of the services being charge controlled. In principle, 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.

## Weighting price changes and consideration of additional controls within baskets

- 3.81 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 during a period of time (e.g. a financial year). When BT sets prices during the charge control year, we need to consider how the revenue weights for the services 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.

## Our proposals and stakeholder responses

- 3.82 In the March consultation, we considered three different approaches to set basket weights:<sup>108</sup>
- i) current year revenue weights, i.e. 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;

---

<sup>108</sup> These were also considered in the 2014 FAMR Statement.

- ii) prior year revenue weights with individual sub-caps, i.e. the 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; or
  - iii) snapshot approach, i.e. this is a variant of the former which consists of changing 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.
- 3.83 We proposed to adopt the second approach, prior year revenue weights with individual sub-caps for the basket controls.
- 3.84 We did not receive any stakeholder responses on our proposals.

## Our reasoning and decisions

- 3.85 We set out below our reasoning and decisions on the three different approaches we considered to set basket weights discussed above.

### Current year revenue weights

- 3.86 We have decided not to use the current year revenue weights approach because it can involve risks of gaming, potential volatility in charges and administrative burden.
- 3.87 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 the demand for some 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.
- 3.88 Additionally, BT or other telecoms providers could try and game the control by producing misleading forecasts for service volumes in a particular year. Although any overcharge would need to be paid back in subsequent years, there could still be cashflow incentives to engage in charge control gaming.
- 3.89 An alternative way to mitigate the risk of this type of gaming would be for us to review BT’s volume forecasts. However, we would not necessarily be in a position to argue that any forecasts we make to test BT’s forecasts would be more accurate than BT’s. 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.
- 3.90 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.
- 3.91 Also, we consider that the SMP condition requiring 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.

### Prior year revenue weights

- 3.92 Using prior year weights enables BT to plan its charges in a given year with confidence that it will meet the overall basket control.<sup>109</sup> 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 are using a sub-cap on individual charges in a basket (see heading on “Sub-caps at CPI-X+7.5%” below).
- 3.93 We consider that the clause requiring BT to automatically repay its wholesale customers any over-recovery of revenue from the charge controls fits well with prior year revenue 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 the risk of being unable to recover the allowed revenue of a basket in that period or subsequent ones.

### Snapshot approach

- 3.94 We have decided not to use the snapshot approach as we do not consider it would be appropriate for services where revenues and volumes may be volatile. If volumes are volatile the latest volume information is unlikely to be the most representative. In the case of MPF ancillary services there is a significant degree of revenue and volume volatility for some of the basket services, which may persist in the future.<sup>110</sup> Given the potential for revenue volatility in future years, we do not consider the snapshot approach is appropriate for our ancillary baskets.

---

<sup>109</sup> 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 (see Annex 33, Condition 9.4 in the Legal Instruments for this Statement). 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.

<sup>110</sup> We can illustrate this with three examples. Revenue from MPF tie pair modification (3 working day lead time re-termination) was £[redacted] in 2013/14 and £[redacted] in 2014/15. Revenue from MPF new provide standard was £[redacted] in 2013/14 and £[redacted] in 2014/15. Revenue from MPF standard line test was £[redacted] in 2013/14 and £[redacted] in 2014/15. BT’s 2015/16 LLU WLR Confidential Compliance Statement.

### Conclusion on basket weightings

- 3.95 We have decided to use prior year revenue to weight services in the basket controls. Prior year revenues provide the most certainty for all stakeholders and the potential for gaming the control can be mitigated through the use of sub-caps (as described below).
- 3.96 We have decided to continue the SMP Condition in which BT is required to automatically make repayments to its wholesale customers any amounts that are overcharged by reference to the charge controls. The clause does not operate if BT over-complies with the controls.

### Sub-caps at CPI-X+7.5%

- 3.97 We have decided to set the basket sub-caps at CPI-X+7.5% (i.e. the controlling percentage for the respective basket plus 7.5%).<sup>111</sup>
- 3.98 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 over how it recovers common costs within the charge control baskets. Also, sub-caps provide some degree of protection to customers from the risk of large price increases (and excessive prices), as well as protecting retail competition, by limiting BT's scope to distort competition by concentrating price increases on services that are largely consumed by non-BT telecoms providers.<sup>112</sup>
- 3.99 We have decided to use sub-caps rather than inertia clauses.<sup>113</sup> First, we consider there is likely to be greater risk of Openreach pricing too high rather 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.<sup>114</sup>
- 3.100 We consider that sub-caps are easy to understand and set, and mitigate the risks of gaming whilst continuing to allow some pricing flexibility.
- 3.101 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).
- 3.102 Setting the appropriate level of sub-caps on individual charges requires the exercise of regulatory judgement 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

---

<sup>111</sup> This was also considered in the 2014 FAMR Statement – Volume 2, paragraph 4.291.

<sup>112</sup> This relates to our objectives of protecting consumers against the risk of high prices, and protecting retail competition where necessary, based on access to BT's network.

<sup>113</sup> An inertia clause limits the maximum annual increase or decrease of a charge, whereas a sub-cap only limits the charge increase.

<sup>114</sup> BT's 2016/17 LLU WLR Compliance Statement shows that for most of the LLU baskets the controlling percentage is close to the weighted percentage price change (if not the same).

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 Openreach flexibility to set charges within the basket whilst also providing protection to telecoms providers purchasing each specific service. Also, from the data reported in BT's LLU and WLR Price Control – Confidential Compliance Statements from 2014/15 to 2016/17, we have not observed any systematic behaviour that, in our view, may be considered gaming. Therefore, we have decided to take the same approach again in this charge control.

## 4. Charge control cost modelling

- 4.1 In this section we summarise our approach to estimating the cost of MPF and GEA services (rental and ancillary services) for the purposes of setting charge controls which will apply from 1 April 2018 to 31 March 2021.
- 4.2 This section is structured to discuss:
- our modelling approach: we set out our choice of modelling approach to estimate the cost of MPF and GEA 40/10 services, the relationship between the models we have produced and how we have undertaken information gathering to inform the inputs to our modelling;
  - a summary of our how we have calculated our service volume forecasts;
  - the design of the top-down model to estimate the cost of MPF services and our key inputs to this model;
  - the design and calibration of the bottom-up model to estimate the GEA 40/10 rental costs; and
  - a summary of the model outputs for the MPF and GEA 40/10 rental charge controls.<sup>115</sup>
- 4.3 More detailed information on our decisions relating to the charge control cost modelling and modelling inputs can be found in Annexes 10 to 23, and in the models we have published alongside our statement.
- 4.4 In January 2018, we commissioned Plum Consulting London LLP (Plum) to provide an external review of our top-down and bottom-up models. Plum completed its work in January and February 2018. A letter outlining the scope of its work, its approach and findings is published alongside our statement. We have considered the issues raised by the external review in finalising our models.

### Modelling approach

- 4.5 As set out in Section 2, to estimate costs for the charge controls, we have used an anchor pricing approach based on an ongoing copper access network with an FTTC overlay providing GEA services. There are a number of different approaches we could have used to estimate the future costs of these services. Historically, when forecasting 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. In this type of model we forecast the costs based on asset volume elasticities (AVEs) and cost volume elasticities (CVEs) applied to our forecast of component volumes. The model then allocates costs to services based on usage factors.

---

<sup>115</sup> We set out our decisions and the model outputs for MPF, LLU and GEA ancillary services in Annex 23. As explained in Annex 23, whilst the focus of our controls is on MPF and GEA services, in some cases we also charge control ancillary services related to SMPF, given they are not performing the same function as the equivalent MPF ancillary services.



- Bottom-up model:<sup>116</sup> based on an estimate of how much network equipment is required to efficiently deliver a projected level of service volumes for a specific service cost driver (referred to as network dimensioning). These network equipment volumes are then converted into costs based on evidence of the capital expenditure and operating expenditure associated with each unit of equipment. Costs are then allocated to services based on the drivers that were used to dimension the network.

4.6 We consider a top-down model forms the best basis for estimating the cost of MPF services. We have an established model that can reliably 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 services in the RFS for a number of years, meaning we have some confidence in the data and the cost volume relationships that underpin it. We consulted on and have decided to use BT's top-down cost data as the basis for estimating the cost of MPF services. We discuss the details of how we have built the top-down model in Annexes 11 and 12.

4.7 With regard to fibre cost modelling, we consulted on and have decided to model the incremental cost of providing GEA services using a bottom-up model based on an FTTC network using VDSL<sup>117</sup> technology. We discuss details of how we have built the bottom-up model in Annex 14 and address stakeholder responses to our consultations there. In summary, we consider a bottom-up model is preferable to a top-down model for estimating the costs of GEA services because it:

- a) allows us to more accurately calculate 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; and
- b) is more transparent because it can be published with fewer redactions.

4.8 A bottom-up model is also more consistent with the approach set out in the 2013 EC Recommendation.<sup>118</sup> We discuss the consistency of our modelling approach with the 2013 EC Recommendation in Section 5.

## 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.

---

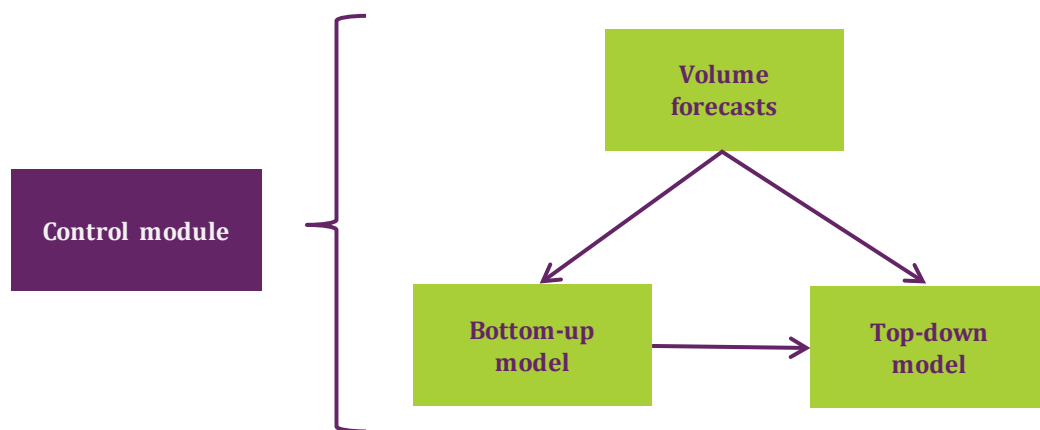
<sup>116</sup> When we build a bottom-up model we will usually calibrate it against top-down data meaning it is sometimes referred to as a hybrid model.

<sup>117</sup> Very high bit rate digital subscriber line.

<sup>118</sup> 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](http://ec.europa.eu/smart-regulation/impact/ia_carried_out/docs/ia_2013/c_2013_5761_en.pdf) [accessed 22 February 2018].

4.10 The high-level relationships between the control module, the bottom-up and top-down models and service volume forecasts are shown in the figure below. We calculate service volume forecasts 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.<sup>119</sup> We use these GEA LRIC cost estimates as inputs to the top-down model. Our top-down model calculates:

- a) the aggregate current cost accounting (CCA) FAC for the WLA and WFAEL<sup>120</sup> markets;
- b) the unit CCA FAC for some MPF services;<sup>121</sup>
- c) the unit LRIC for some MPF services;<sup>122</sup>
- d) the allocation of common costs across MPF rentals and GEA rentals; and
- e) 'X' values for the charge control.

### Approach to information gathering to inform our modelling

4.12 Our cost modelling has been informed by an extensive process of information gathering including information gathered using our formal powers and responses to our consultations. We discuss the relevant data sources within our annexes.

4.13 Some stakeholders have raised concerns with information asymmetry between BT, other telecoms providers and Ofcom. They noted that BT has an incentive to inflate costs (thereby increasing the level of the charge controls) and with no clawback for

<sup>119</sup> 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).

<sup>120</sup> Wholesale Fixed Analogue Exchange Line market which includes Wholesale Line Rental (WLR) services. This is included to allow common costs to be allocated across similar services.

<sup>121</sup> Hard Ceases (including SMPF Hard Ceases), Co-mingling New Provide and Rental Services, Tie Cables, and Other LLU Ancillary Services.

<sup>122</sup> MPF Single and Bulk Migrations, as well as MPF Rentals (for re-allocating common costs across rental services).

outperformance of the controls, there is no incentive for BT to not behave in this way.<sup>123</sup> Some stakeholders suggested that we sanction BT for its actions and undertake a greater level of proactive scrutiny of BT’s regulatory financial information.<sup>124</sup>

- 4.14 We agree that it is very important that our charge controls are based on accurate information. Our formal information requests put a legal duty on recipients to provide accurate and correct information. If the information provided is not accurate, we can and have taken enforcement action, including imposing financial penalties.<sup>125</sup>
- 4.15 Once we have received data using our formal powers, we undertake a rigorous analysis of both the accuracy of the data and whether the data are appropriate for use in our models. As set out in the relevant annexes, we have made adjustments to the data we received (both adding and removing costs) to address inaccuracies or better align the underlying data with our approach to modelling.
- 4.16 In setting charge controls, we forecast efficient costs using a wide range of input data. These not only include historical information gathered from a range of stakeholders but also evidence to allow us to estimate the evolution of future costs. We consider the extensive data gathering process that we have undertaken and the rigorous analysis of the information provided, as well as our enforcement powers and regulatory reporting requirements, largely mitigates any risk of deliberate gaming of the information asymmetries by BT.
- 4.17 Finally, we discuss our decision to adopt incentive regulation in Section 2 and the incentives this form of regulation has. We have decided not to pursue a “clawback” of outperformance.

## Service volume forecasts

- 4.18 Service volume forecasts are used by our bottom-up and top-down models to estimate individual service costs for MPF and GEA services as well as calculating the common cost allocations within the model. In Annex 10 we discuss how we have forecast the total number of Openreach lines and how individual service forecasts have been created. A summary of the steps we have taken to estimate service volumes until 2020/21 is set out below.
- **Step 1:** We forecast the number of fixed lines to UK households and small businesses (excluding mobile only households and businesses that are likely to use a leased line).

---

<sup>123</sup> For example, Sky, Vodafone and TalkTalk discussed the errors in cost data provided to Ofcom. See Sky response to the September 2017 WLA Consultation, paragraphs 1.1-1.18, Vodafone response to the September 2017 WLA Consultation section 1.2 and TalkTalk response to the September 2017 WLA Consultation, page 23. See also UKCTA response to the September 2017 WLA Consultation, page 2.

<sup>124</sup> See Sky response to the September 2017 WLA Consultation, paragraphs 1.14-1.15, TalkTalk response to the September 2017 WLA Consultation, page 23, UKCTA response to the September 2017 WLA Consultation, page 2.

<sup>125</sup> For example, we recently concluded an investigation into BT’s compliance with a statutory information request as part of the WLA Market Review and imposed a fine on BT. See [https://www.ofcom.org.uk/about-ofcom/latest/bulletins/competition-bulletins/all-closed-cases/cw\\_01208](https://www.ofcom.org.uk/about-ofcom/latest/bulletins/competition-bulletins/all-closed-cases/cw_01208).

- **Step 2:** We forecast the number of Openreach lines, taking into account observed market trends and our expectation of how the market will develop (e.g. additional competition from alternative networks).
- **Step 3:** We estimate how the forecast Openreach lines should be split between MPF, WLR, SMPF and GEA<sup>126</sup> rental services.
- **Step 4:** We forecast connections and ancillary services based on the forecasts for rental volumes.

4.19 The outputs from our volume forecasts are summarised in Table 4.2 below.

**Table 4.2: Summary of WLA and WFAEL 2016/17 actual and 2020/21 forecast lines**

	2016/17 Actuals		2020/21 Forecasts	
	Number of lines (millions)	Share of all Openreach lines	Number of lines (millions)	Share of all Openreach lines
MPF lines <sup>127</sup>	7.2	29%	4.6	19%
WLR lines <sup>128</sup>	4.8	19%	3.4	14%
WLR + SMPF	6.3	25%	3.5	14%
MPF + GEA <sup>129</sup>	1.9	8%	5.1	21%
WLR + GEA <sup>130</sup>	4.8	19%	7.8	32%
<b>Total Openreach lines</b>	<b>25.1</b>		<b>24.6</b>	

Source: BT actuals (consistent with 2016/17 RFS) and Ofcom 2020/21 forecasts

## Top-down model of MPF costs

4.20 In this sub-section we summarise the approach we have taken to estimating the cost of MPF services including the MPF SML1<sup>131</sup> rental service on which we have decided to impose a charge control.

4.21 As set out in Section 2, the top-down model is based on an efficient ongoing national copper network providing services in both the WLA and WFAEL markets. In addition, the

<sup>126</sup> We have assumed that all Openreach fibre based broadband services are GEA-FTTC to be consistent with our anchor technology approach. Furthermore, we forecast GEA volumes split by the available bandwidth variants for GEA-FTTC.

<sup>127</sup> MPF lines that are not purchased with GEA.

<sup>128</sup> This includes both residential and business lines that use WLR but not a subsequent SMPF or GEA line.

<sup>129</sup> This includes both GEA-FTTC and GEA-FTTP service volumes in 2016/17. The forecasts will include use of G.Fast and SOGEA.

<sup>130</sup> This includes both GEA-FTTC and GEA-FTTP service volumes in 2016/17. The forecasts will include use of G.Fast and SOGEA.

<sup>131</sup> Service Maintenance Level 1 (SML1): Fault clear by 23:59 day after next, Monday to Friday, excluding public and bank holidays.

model includes common costs associated with BT's WLA services (i.e. both MPF and GEA services) and WFAEL services (e.g. WLR) which cannot be attributed directly to the individual services.

- 4.22 Stakeholder responses and our decisions on the different aspects of the top down model are discussed in Annexes 11 and 12 (general approach and details of the model and inputs) and Annexes 17 to 22 (inflation, AVEs and CVEs, efficiency, cost of capital, cumulo and sales of copper and sales of property). Our decisions in relation to a number of MPF and SMPF ancillary services are set out in Annex 23.

## Model design

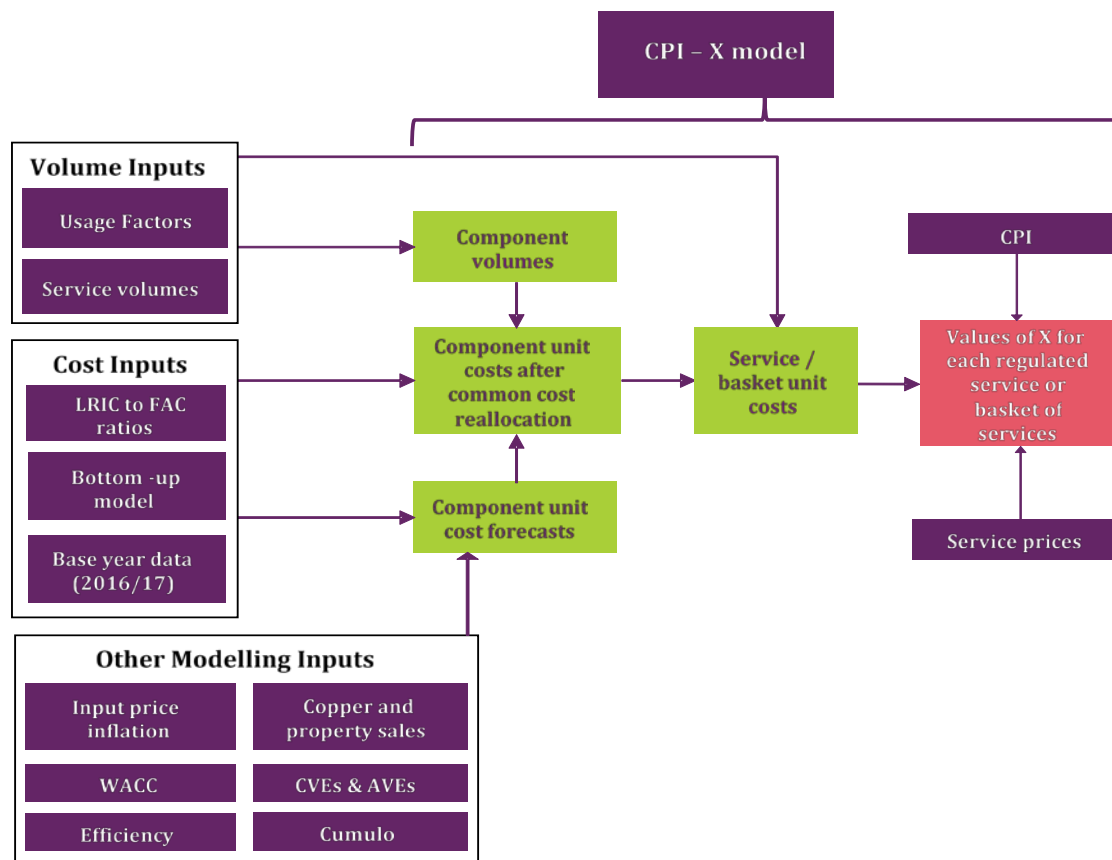
- 4.23 The top-down model forecasts costs from the base year (2016/17) up to and including the final year of the charge control period (2020/21).

- 4.24 Our top-down model calculations consist of the following six key steps:

- **Step 1:** We forecast service volumes over the modelling period using the outputs of the volumes model.
- **Step 2:** We convert service volumes to Network Component volumes using service usage factors to determine network component volume growth rates.
- **Step 3:** We calculate forecasts of the capex and opex costs for each network component using the base year costs and applying estimated asset price changes, efficiency forecasts, as well as AVEs and CVEs combined with network component volume growth rates.
- **Step 4:** We calculate future service costs based on the amount of each network component that a given service uses (i.e. by using the usage factors).
- **Step 5:** We allocate common costs to reflect incremental cost differences, as well as to reflect any policy decisions.
- **Step 6:** We calculate the X-values to be used in the CPI-X controls for each service or basket of services, as appropriate.

- 4.25 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

### Adjustments to our top-down model

4.26 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 2016/17 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. As discussed in Annex 12, we have made some adjustments where the 2016/17 costs were not representative of the forward-looking costs of an ongoing network. In addition, we have separately forecast some costs where they are likely to be materially different going forward or we did not consider the general approach in the top-down model (as set out in Annex 11) was appropriate. We discuss these in more detail below.

### Adjustments to 2016/17 costs

4.27 We have made the following adjustments within the base year costs and the CPI-X model:<sup>132</sup>

- **restructuring costs and property rationalisation provision costs:**<sup>133</sup> given these costs can be volatile between years, we have assessed these costs over a four-year period and included an average as an adjustment in our base year model;
- **tie cables:** we have removed the historical capitalised labour installation costs within the base year and replaced them with an estimate of the in-year labour operating costs required to install tie cable services;
- **co-mingling:** we have made adjustments to the base year to remove historical capitalised co-mingling survey and provision costs and reattributed the class of work ACPA<sup>134</sup> costs;
- **pensions:** we have adjusted the base year pay costs by £34m to reflect our estimate of the efficient level of pension costs given the announced changes to BT's pension schemes and current market conditions; and
- **ongoing network adjustments** – we consider it appropriate to model the costs of an ongoing copper network, which requires an adjustment to BT's costs.

### Separate forecast costs

4.28 We have separately forecast a number of different cost components due to factors that materially impact their forward-looking costs or for some services where we consider a different approach is appropriate. These forecasts are then input into the CPI-X model. This includes:

- **business rates (cumulo):** we forecast business rate costs separately given the expected significant increase in these costs from 2018/19 onwards. Our decision on cumulo costs is discussed later in this section and Annex 21;
- **service level guarantees (SLGs) and repair related costs:** we forecast SLG and repair costs separately to account for expected changes due to QoS improvements and automatic compensation (also discussed in detail in Annex 13);
- **sales of copper:** BT generates revenue from sales of copper (and other material) no longer required in its network. We currently estimate the value of this copper to be £240m and we therefore consider it could be a significant revenue stream in the future. We have offset these proceeds against costs across all copper access lines in our top-down model. Our decision on sales of copper is discussed in Annex 22;

---

<sup>132</sup> Within the base year we have also removed costs and income associated with BDUK to ensure we reflect the unit FAC for BT's commercial deployment.

<sup>133</sup> Restructuring costs relate to changes in BT's organisational structure that result in redundancy payments and property rationalisation provision costs relate to BT's strategy of consolidating its office space to enable the mothballing and subletting of buildings.

<sup>134</sup> ACPA costs cover LLU related accommodation, cables and equipment; electronics, lights, power, network cables, security works, broadband enabled equipment and overheads (i.e. travel and subsistence, material handling charges, planning team salary costs).

- **DPA costs** – we have included forecast costs and revenues associated with our PIA remedy (see Volume 3); and
- **modelling simplifications** – we have applied a simplified but consistent modelling approach for certain components and services e.g. TRCs and SFIs.

## Summary of key inputs to the top-down model

4.29 We now discuss our decisions on the key inputs to our top-down model.

### Efficiency

- 4.30 One of the key inputs into the top down model is the level of efficiency improvement we assume that Openreach can achieve over the period of the control. As discussed in Annex 19, we consider efficiency to be cost savings that are not due to the impact of inflation or changes in volume. This includes cost savings that can be achieved by doing things less often, doing things more quickly and stopping doing things that are no longer needed.
- 4.31 In our March consultation, we proposed a range of efficiency targets for all copper operational costs (including repair costs) from 3.5% to 6.5%, with a proposed target of 5.5%.<sup>135</sup> In our March 2017 QoS Consultation, we proposed higher QoS standards for Openreach. We also considered that by Openreach investing in preventative maintenance, the volume of faults would reduce over the charge control period. We forecast a circa [X] (18-21%) reduction in the annual fault rate over the five-year forecasting period which equated to a c. [X] (4-5%) annual reduction in repair costs.
- 4.32 Following our March consultations, we have updated our analysis based on new information (including the 2016/17 actuals) and views and evidence provided by stakeholders. In particular, Openreach was concerned that we were double counting efficiency savings between our QoS and efficiency proposals.<sup>136</sup> To ensure this is not the case, and to improve the transparency of our overall efficiency proposals, we have forecast repair costs separately from non-repair costs.
- 4.33 As set out in Annex 19, taking into account all of the evidence available to us, we have decided that the appropriate efficiency target for non-repair costs should be 4.5% per annum. The reduction from our base case proposal of 5.5% in the March consultation is largely due to further evidence on Openreach's ability to achieve a similar level of cost savings in the future and changes to our analysis following new evidence and stakeholder comments.
- 4.34 For repair costs, as explained in Annex 13, we expect Openreach to reduce the rate of faults over the forecast period and that this will lead to cost savings. We have estimated that Openreach can reduce the fault rate for copper services by around c. [X] (10-13%)

---

<sup>135</sup> Our approach to the efficient costs of an FTTC network for use in our bottom-up model is discussed in Annex 14.

<sup>136</sup> Stakeholder responses and our views on these are set out in detail in Annex 13 (in relation to QoS) and Annex 19 (for all non-repair costs).



over the next four years and we expect this to result in repair cost savings of around c. [3%] (2-3%) per annum.

- 4.35 We then considered whether Openreach will also be able to achieve further efficiencies for repair costs, for example, by doing things more quickly (i.e. task time efficiency), improving operational processes or making technological advances. Based on our analysis of BT's historical and forecast cost information, we have decided that a further efficiency assumption of [3%] (2%-3%) per annum is appropriate. This equates to total cost savings of 5.5% per annum on repair costs, including the reduction in the number of faults and improvements in efficiency in other areas.<sup>137</sup>
- 4.36 Combining the 5.5% repair cost efficiency assumption with our non-repair cost efficiency assumption of 4.5% per annum results in an overall average rate of efficiency saving across all operating costs of 4.8% per annum.
- 4.37 In relation to capital expenditure, we have decided to set an efficiency target of 3.0% per annum. This represents the mid-point in our analysis and we consider represents a stretching but achievable target.

#### Cumulo costs

- 4.38 Cumulo rates are the non-domestic rates (property tax) BT pays on its rateable assets<sup>138</sup> in the UK. It is called a cumulo assessment because all of the rateable assets are valued together.
- 4.39 We have decided to forecast BT's cumulo costs separately to reflect the large increase in BT's Rateable Values (RVs) that came into effect on 1 April 2017. Our forecasts now reflect recent revisions to these values plus the transition scheme that applies in England and the effect of increasing demand for MPF and GEA-FTTC lines on BT's RV over the charge control period.
- 4.40 In addition, we have decided to attribute cumulo costs in three steps:
- a) estimating the cumulo costs attributable to GEA services by assuming each GEA rental connection attracts an RV of £18 per annum in each year;
  - b) attributing all GEA cumulo costs to GEA rentals; and
  - c) attributing all non-GEA cumulo costs across non-GEA network components using a profit weighted net replacement cost approach.
- 4.41 The net effect of these decisions is that we are forecasting the contribution from BT's cumulo rates costs to be £5.93 per line on MPF rentals costs and £9.09 per line on GEA

---

<sup>137</sup> As explained in Annex 13, in modelling repair costs we have also taken into account that for Openreach to achieve the higher QoS standards and still recover its efficiently incurred costs, there will need to be an increase in repair costs of around 14% over the forecast period (c. 3.5% per annum). We do not include these costs in our assessment of operational expenditure efficiency because it represents the additional costs of Openreach producing a superior level of service (i.e. the additional costs of repairing a higher proportion of faults on time) and consequently would not allow comparison between years on a consistent basis.

<sup>138</sup> For example, duct, fibre, copper and exchange buildings.

40/10 rentals costs in 2020/21. The details of how we have forecast and attributed cumulative costs are set out in Annex 21.

### Cost of capital

4.42 When setting a charge control, we are concerned with estimating the weighted average cost of capital (WACC) on a forward-looking basis. As described in Section 3, we have used a glidepath to align charges with costs in 2019/20 and 2020/21 (the final year of the control period). Therefore, for modelling purposes, we require an estimate of the WACC in both 2019/20 and 2020/21.

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

4.44 For this statement, we have applied:

- the Openreach copper access pre-tax nominal WACC of 8.1% in 2019/20 and 7.9% in 2020/21 to WLA copper and passive access services; and
- the Other UK telecoms pre-tax nominal WACC of 9.3% in 2019/20 and 8.9% in 2020/21 to fibre access.

4.45 The details of our decisions on WACC are set out in Annex 20.

### Other key inputs

4.46 There are various other inputs to the top-down model which include:

- **Pay and non-pay inflation:** We have adopted an average annual non-pay inflation assumption in our cost modelling of 2.6% and a pay cost inflation rate of 2.8% (see Annex 17).
- **Asset price inflation:** We have adopted asset price change assumptions which ensure that duct and copper assets are valued consistently with how they are revalued for CCA purposes in BT's RFS. All other asset prices are assumed to stay constant in nominal terms (see Annex 17).
- **AVEs and CVEs:** Asset volume elasticities (AVEs) and cost volume elasticities (CVEs) are used to determine how component costs change when component volumes change.<sup>139</sup> We have calculated our own AVE and CVE estimates based on BT's LRIC to FAC ratio for each component within its LRIC model (see Annex 18).
- **Sales of property:** Profits and losses arise when BT sells property that it considers surplus to requirements. We have not adjusted the base-year model for sales of property, but consider BT should include sales of property in its RFS so that we can monitor revenues. We have also required BT to notify us of any changes to the attribution of these sales (see Annex 22).

---

<sup>139</sup> AVEs and CVEs typically have a value of less than 1, meaning a 1% increase in volume causes a smaller than 1% increase in total costs. A CVE less than 1 implies the presence of economies of scale and a CVE greater than 1 implies the presence of diseconomies of scale.

## Common cost allocation

- 4.47 We allocate costs that are common to copper and fibre 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 GEA-FTTC services: we have decided to use the EPMU approach
  - across copper services: we have decided to allocate the same absolute amount of common costs to each MPF and WLR line; and
  - across GEA-FTTC services: we have decided to allocate common costs between GEA-FTTC services with different speeds based on the current observed difference in prices.
- 4.48 In Annex 12, we set out how we have implemented the 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.
- 4.49 We set the charge controls for some services using their forecast LRIC rather than forecast 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 forecast the common costs currently allocated to GEA services to ensure consistency with the bottom-up model's GEA LRIC.

## Bottom-up model of GEA-FTTC costs

- 4.50 In this sub-section we summarise the approach we have taken to estimate the LRIC of GEA services including the GEA 40/10 rental service on which we have decided to impose a charge control. We also discuss the approach we have taken to calibrating this model with Openreach's information and to ensure that the outputs are consistent with the top-down model.
- 4.51 Stakeholder responses and our decisions on the different aspects of the top-down model are discussed in Annexes 14 and 15 (details of the model and calibration). Cartesian's report<sup>140</sup> is set out at Annex 29. We also set out at Annexes 17, 20 and 21 (inflation, cost of capital and cumulo) and our decisions in relation to a number of GEA ancillary services are set out in Annex 23.

## Model design

- 4.52 We have used a bottom-up model to calculate the LRIC of GEA services. FTTC costs are modelled using VDSL technology as an ongoing overlay to an existing copper network. The modelling duration is from 2007/08 (when FTTC roll-out is assumed to have begun) to 2028/29. We use the data from 2018/19 to 2020/21 for the purposes of setting our charge

---

<sup>140</sup> The Cartesian report provides details of how we have calculated the amount of equipment required for our modelled fibre to the cabinet (FTTC) network and identified the costs associated with that equipment.

controls and undertake some cross checks as part of our analysis for years beyond the charge control.

4.53 In a 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.

4.54 In our May 2016 and March 2017 WLA Consultations, we proposed to use a scorched node approach and respondents who commented on our proposal agreed with this approach. 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 the reality of Openreach’s actual network deployment.

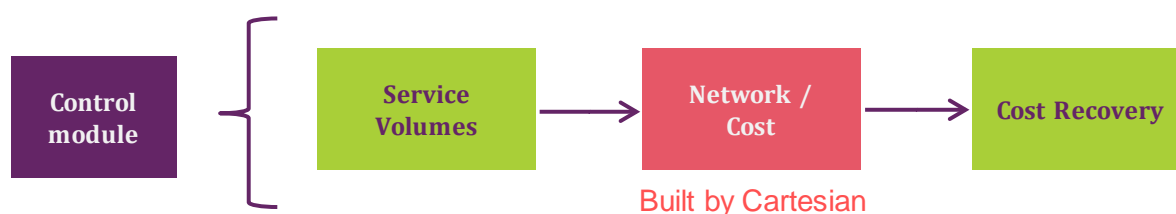
4.55 In order to reflect competitive market outcomes, we have excluded areas where FTTC deployment has been subsidised (in part or in whole). We believe that excluding the costs, volumes and revenues associated with subsidised rollout from our modelling is likely to best mirror the costs of an efficient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

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

- **Step 1:** We take service volumes over the modelling period from the WLA Volume Module.
- **Step 2:** We dimension a network capable of meeting these service volumes.
- **Step 3:** We calculate the cost of the assets in the dimensioned network.
- **Step 4:** We spread the costs of the network over time (i.e. calculate a depreciation profile for the network assets).
- **Step 5:** We recover the cost of the network by allocating the costs of each network element to services based on the routing factors used to dimension the network.

4.57 The structure of the bottom-up model is shown in the figure below.

**Figure 4.4: Structure of the bottom-up model**



Source: Ofcom

### Network Cost module

4.58 The Network Cost module uses the service volumes and coverage information to calculate the necessary volumes of the fibre network components. It then takes these component

volumes and multiplies them by the capital expenditure (for those assets purchased) and operating expenditure (for those assets in operation) for each component to give the total expenditure in each year. Details of the Network Cost module are laid out in the Cartesian Report on the bottom-up model in Annex 29.

- 4.59 In addition to the cost outputs from the bottom-up network cost model, similar to the top-down model, we have included some costs or adjustments that are incremental to GEA-FTTC services but not captured by our network dimensioning parameters. These are:
- business (cumulo) rates (as discussed above);
  - pension costs (as discussed above);
  - OSS/BSS – system development costs; and
  - Service level guarantees and repair related costs (as discussed above).
- 4.60 We have also taken account of Openreach’s most recent NGA business case and Fibre First programme when forecasting the coverage of a commercial NGA network.<sup>141</sup> We have used Openreach’s cost forecasts in these business cases to ensure our bottom-up modelling over the charge control period is appropriate. Where we identified discrepancies, and were able to validate Openreach’s forecasts, we made adjustments to our network dimensioning. In particular, we have:
- added [redacted] (~1,600) second FTTC cabinets, [redacted] (~2,000) cabinet upgrades and adjusted the proportion of copper cabinets that require re-shelling from [redacted] (~18%) to [redacted] (~39%) to account for demand growth for FTTC services over the years 2017/18 to 2020/21;
  - uplifted the unit capex of DSLAM elements by 15% from 2017/18 to account for Openreach’s plan to deploy vectoring in its FTTC network; and
  - added [redacted] new FTTC cabinets to account for Openreach’s FTTP rollout plans in commercial areas where FTTC is not yet available. We have assumed these cabinets will be deployed over the period 2018/19 to 2020/21.
- 4.61 These adjustments are implemented in the ‘Input\_Coverage’ and ‘Input\_CostTrends’ tabs of the Network Cost module.

### Cost Recovery module

- 4.62 Once the total costs of the fibre access network have been calculated, we must determine the path of cost recovery over time and across services:
- the bottom-up model uses CCA depreciation to determine the level of cost recovery over time. This is implemented in the ‘CCA’ tab of the Cost Recovery module;
  - E-side duct costs are then added as a top-down allocation. This is implemented in the ‘TD cost allocations’ tab of the Cost Recovery module;

---

<sup>141</sup> Openreach submitted its updated NGA1 business case alongside its response to our March consultation. For Openreach’s Fibre First programme see <https://www.homeandbusiness.openreach.co.uk/news/fibrefirst>.

- having calculated the CCA costs for each year we then determine how these costs should be recovered across services;<sup>142</sup> and
- the final service unit costs are calculated.<sup>143</sup>

## Calibration of the bottom-up model

- 4.63 We have calibrated the bottom-up model to ensure that the intermediate and final outputs are reasonably in line with a real world network deployment and cost. We set out the details of our calibration in Annex 15. As a result of this calibration, we have made some adjustments to our model inputs and network design parameters where appropriate.
- 4.64 We have calibrated our bottom-up model using as much information as we can.<sup>144</sup> Calibrating over a number of years is preferable to a point calibration because it enables us to observe the changes in the calibration metrics and compare them to changes in our bottom-up model outputs. We have received actual asset count and cost information from Openreach for the following years which we have used in our calibration:
- a) 2015/16 and 2016/17 for asset count; and
  - b) 2014/15, 2015/16 and 2016/17 for cost information.
- 4.65 We have used a two-stage approach to our model calibration:
- **Stage 1** – Asset count calibration: we compared the number of network elements dimensioned by the bottom-up model against BT’s asset count information; and
  - **Stage 2** – Cost calibration: we compared the model against multiple BT cost metrics (Gross Replacement Costs (GRC), Net Replacement Costs (NRC), opex, capex, total CCA costs).
- 4.66 As a final cross-check, we compared the combined MPF and GEA 40/10 unit LRIC+ produced by the bottom-up and top-down models against comparable access prices set by other European NRAs. We have not, however, calibrated the model against European price benchmarks.

## Cost modelling outputs of the MPF and GEA 40/10 rental charge controls

- 4.67 The results from our cost modelling and our decisions on the charge controls for MPF and GEA 40/10 rental services are set out in the table below.<sup>145</sup>

---

<sup>142</sup> The ‘Service\_Costing’ tab of the Cost Recovery module uses routing factors to allocate the modelled network costs to each relevant service.

<sup>143</sup> See the ‘Outputs\_TD model’ tab. There, we have made an additional top-down allocation to capture the duct costs for the modelled network. These duct costs are calculated in the ‘TD cost allocations’ tab of the same workbook.

<sup>144</sup> Since our March consultation we have been able to include additional information for the purposes of our calibration exercise.

<sup>145</sup> We set out our charge control decisions on certain LLU (MPF and SMPF) and GEA ancillary services in Section 1 – Tables 1.2-1.3.

Table 4.5: Charge controls on MPF and GEA 40/10 rentals\*

	Current annual charge (£)	Charge control annual charge CPI-X (nominal charge estimates <sup>146</sup> £)		
		2018/19	2019/20	2020/21
MPF	84.38	85.46	CPI-2.4% (84.95)	CPI-2.1% (84.84)
GEA 40/10	88.80	69.59	CPI-14.0% (61.12)	CPI-4.0% (59.91)

Source: Output from our control module and Openreach's price list [accessed 23 March 2018]

\*Some of the figures in this table and paragraph 4.68 below have subsequently been amended as set out in the explanatory note: [https://www.ofcom.org.uk/data/assets/pdf\\_file/0011/114203/Explanatory-note-modification-SMP-condition-7a.pdf](https://www.ofcom.org.uk/data/assets/pdf_file/0011/114203/Explanatory-note-modification-SMP-condition-7a.pdf)

4.68 BT is required to give its wholesale customers notice of any price increases 90 days before they come into effect. As such, we do not expect any increase in MPF prices to come into effect towards the end of May 2018 at the earliest. We have therefore set the charge control so that BT must charge no more than £85.46 *on average* over the course of that financial year. This means that BT may set the charge slightly higher than £85.46 so that over the course of the year the cap is not exceeded. The form of the control is discussed in Section 5.

<sup>146</sup> This is our estimate of the price in 2019/20 and 2020/21, the actual price will depend on the Consumer Price Index minus the 'X' applied.

## 5. Implementation of our WLA charge control decisions and legal tests

- 5.1 In this section, we explain how the charge controls for copper (LLU, MPF) and fibre (VULA) services will work to address, together with the other remedies discussed in Volume 1, the competition concerns arising in the WLA market in the UK excluding the Hull Area, in which we have found that BT has SMP. We explain how some of the key charge control decisions set out in Sections 3 and 4 of this volume and Annex 23 are implemented in the legal instruments at Annex 33.
- 5.2 We also explain why we consider that our decision to impose charge controls in the form set out in the legal instruments at Annex 33 satisfy the legal tests set out in the Act and why we consider that, in making our charge control decisions, 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.

### Implementation of WLA charge control decisions

- 5.3 The SMP Conditions 7A (for copper services), 7B (for fibre services), and 7C (for SFIs, TRCs and for charges straddling both copper and fibre services) as set out in Annex 33, have three key effects. They will:
- a) set charge controls from 1 April 2018 to 31 March 2021 for the services specified;
  - b) 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
  - c) require BT to provide information annually to Ofcom to enable compliance monitoring.
- 5.4 In this sub-section, we explain the structure of Conditions 7A, 7B and 7C and how they will work in practice. In particular, we discuss:
- a) how the charge controls will work alongside other regulation and interact with other remedies;
  - b) the baskets and services covered by the conditions; and
  - c) how we will ensure compliance with the charge ceilings created by the CPI-X controls.
- 5.5 We received a small number of stakeholder responses which dealt specifically with the implementation of our proposals within the draft legal instruments and which have not been addressed elsewhere in this document.<sup>147</sup> We address these at the end of this sub-

---

<sup>147</sup> Stakeholder responses relating to our charge control proposals themselves are addressed in relevant sections and annexes throughout Volume 2.



section, along with a short explanation of the corrections and clarifications we have made as part of finalising the legal instruments.

5.6 The text of our copper and fibre charge control conditions is set out in Annex 33.

### **Interaction with other remedies**

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

- a) provide network access on reasonable request, which includes that access must be provided on fair and reasonable terms and conditions (which includes charges in the absence of applicable charge controls or basis of charges obligations) (Condition 1 and direction);
- b) provide specific forms of network access (Condition 2);
- c) set out and follow a process in relation to requests for new forms of network access (Condition 3);
- d) not unduly discriminate in relation to matters connected with network access (Condition 4);
- e) provide network access on an Equivalence of Inputs basis, except in relation to existing network access not being provided on an Equivalence of Inputs basis as at the date of entry into force of the SMP condition (Condition 5);
- f) publish a reference offer (Condition 8);
- g) notify charges and technical information (Conditions 9 and 10);
- h) 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 BT pursuant to Conditions 1 and 2 (as applicable) (Condition 11); and
- i) comply with rules on regulatory financial reporting (Condition 12).

5.8 The WLA charge controls at 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 found that BT has SMP.

### **Baskets and services covered by the conditions**

5.9 The structure of the SMP charge control conditions for WLA is as follows:

- a) SMP Condition 7A covers MPF SML1 rental services as well as a number of MPF and SMPF ancillary services. Some of these copper ancillary services are grouped into one of four baskets: the Tie Cables basket, the Hard Cease Services basket, the MPF New Provides basket and the Co-Mingling New Provide and Rental Services basket. The Annex to Condition 7A lists the groups of services that fall within each basket;

- b) SMP Condition 7B covers GEA 40/10 rental services as well as a number of fibre ancillary services. All fibre services are subject to individual charge controls (there are no fibre services baskets); and
  - c) SMP Condition 7C covers Special Fault Investigations (SFIs), Time Related Charges (TRCs) as well as a number of controls straddling both copper and fibre services. All these services are subject to individual charge controls (there are no baskets within this condition).
- 5.10 Tables 5.1, 5.2 and 5.3 at the end of the “Baskets and services covered by the conditions” sub-section outline the specific parts of the conditions which set out the charge control caps and formulae relevant to each service.

### Starting charges and values of ‘X’

#### *Rental services*

- 5.11 In Section 4, we set out our decision to set individual charge controls on a number of copper and fibre rental services. The charge ceilings will be subject to the CPI-X formula<sup>148</sup> except for 2018/19 when (apart from MPF SML1 Rental, see below) the controls are set at a particular level for services subject to individual charge controls.
- 5.12 The CPI-X formula sets the charge controls with regard to the rate of inflation, measured by the CPI. The values of ‘X’ for each service or basket are set out in Section 4.
- 5.13 To give effect to our decisions in relation to rental services, we have reflected the final figures set out in Section 4 for these rental services in Conditions 7A and 7B, specifically:
- a) Conditions 7A.2 (copper services) and 7B.2 (fibre services) for the starting charge in 2018/19; and
  - b) Conditions 7A.6 (copper services) and 7B.4 (fibre services) for the CPI-X controls in 2019/20 and 2020/21.<sup>149</sup>
- 5.14 With regard to MPF SML1 Rental, we have made a small amendment to the wording of the starting charge provision at Condition 7A.2, so that BT may charge different prices during 2018/19 provided that the weighted average over the charge control year complies with the cap. This is to enable BT to recover its costs across the year in light of the fact that the current price for MPF SML1 Rental is slightly below the charge control for 2018/19, and to ensure that BT gives telecoms providers at least 90 days’ notice before the price of this key service is increased. The formula to calculate the average charge over the 2018/19 period is set out at Condition 7A.3 and is weighted by reference to the number of days in the relevant year during which a specific charge was in effect.

#### *Ancillary services*

---

<sup>148</sup> We note that the precise formulation in the legal conditions is CPI+X, but since the X for the controlling percentage is in most cases defined as a negative number we have referred to it in the main sections of this document as CPI-X.

<sup>149</sup> In addition, some FTTP rental services are subject to an alignment control as against FTTC rental services in certain circumstances. We deal with these in the “Alignment of certain charges” sub-section below.

- 5.15 In Annex 23, we set out our decision to set individual charge controls for certain ancillary services and to have four separate baskets for some copper ancillary services:
- a) the charge ceilings for the baskets of copper ancillary services will be subject to the CPI-X formula for the entire charge control period;
  - b) with the exception of the individual services covered by sub-paragraph c) below, the charge ceilings for individual copper and fibre ancillary services will be subject to the CPI-X formula except for 2018/19 when the controls are set at a particular level;<sup>150</sup> and
  - c) the charge ceilings for a number of fibre connections and repair services<sup>151</sup> are set as a flat nominal cap for the entire charge control period, while a number of cease services and Cablelink rentals<sup>152</sup> are set to zero.
- 5.16 To give effect to our decisions in relation to ancillary services, we have reflected the final figures that are set out in Annex 23 for these ancillary services in Conditions 7A, 7B and 7C, specifically:
- a) the CPI-X controls for the baskets of copper ancillary services are set out in Condition 7A.6;
  - b) the CPI-X controls are set out in Conditions 7A.6 (copper), 7B.4 (fibre) and 7C.4 (SFIs and TRCs) and the starting charges for 2018/19 are set out in Conditions 7A.2 (copper), 7B.2 (fibre), 7C.2 (TRCs) and 7C.6 (SFIs) for individual ancillary services not covered by sub-paragraph c) below; and
  - c) the flat nominal caps (including those set at zero) are set out in Conditions 7A.2 (copper) and 7B.2 (fibre) for the ancillary services referred to in the footnotes to paragraph 5.15(c) above.

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

- 5.17 Conditions 7A.5, 7B.3 and 7C.3 set out the formula that we have decided to use to determine the Percentage Change for single services. For the First Relevant Year, various products will be subject to specific charge ceilings rather than having a Percentage Change applied. Those ceilings are set out at Conditions 7A.2, 7B.2 and 7C.2.
- 5.18 In relation to the baskets of services, the formula we use 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 have decided 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 decisions. The relevant formula for calculating the percentage change of each of the baskets is set out in Condition 7A.4 in Annex 33.

---

<sup>150</sup> In addition, some ancillary services are subject to an alignment control as against other ancillary services. We deal with these in the "Alignment of certain charges" sub-section below.

<sup>151</sup> 1 Gbit/s Cablelink Connections, 10 Gbit/s Cablelink Connections and Superfast Visit Assure.

<sup>152</sup> MPF soft ceases, SMPF soft ceases, fibre ceases, 1 Gbit/s Cablelink rentals and 10 Gbit/s Cablelink rentals.

5.19 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 have therefore decided to carry over our approach from the 2014 FAMR Statement to:

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

### Sub-caps

5.20 Condition 7A also sets out a number of specific controls on the services which fall within the copper baskets.

5.21 As explained in Section 3, we have decided to set sub-caps for each of the following baskets of services: Tie Cables; MPF New Provides; Hard Ceases; and Co-Mingling New Provides and Rentals.<sup>153</sup> For each of the baskets the relevant formula we will use for calculating the Percentage Change is set out in Condition 7A.4 and the sub-cap constraints in Condition 7A.6.

### Alignment of certain charges

5.22 In Section 4 (in relation to rentals) and Annex 23 (in relation to ancillary services) we explain that we have decided to align the charges between some services as follows:

- a) some copper services will be aligned with other copper services, namely:
  - i) MPF Amend with MPF Cancellation;
  - ii) SMPF Remove Jumper Order Singleton Charge with the MPF equivalent;
  - iii) SMPF Remove Jumper Order Bulk Charge with the MPF equivalent;
- b) some fibre services will be aligned with other fibre services, namely:
  - i) two FTTP 40/10 rental services will be aligned with equivalent FTTC 40/10 services where FTTC is not available;<sup>154</sup>
  - ii) VLAN Moves, GEA 40/10 Cancel/Amend/Modify – CRD and GEA 40/10 Cancel/Amend/Modify – Regrading will each be individually aligned with GEA Bandwidth Modify to 40/10;<sup>155</sup> and

---

<sup>153</sup> See our four-basket structure for relevant copper services in Annex 23.

<sup>154</sup> Specifically, FTTP 40/10 Transition Rental services will be aligned with FTTC 40/10 Rental services, while FTTP 40/10 Voice and Data Rental will be aligned with the charge for FTTC 40/10 Rental combined with MPF SML1 Rental.

<sup>155</sup> For clarity, these charge controls do not apply to FTTP in geographies where FTTP 40/10 Rental is not subject to a charge control.

- c) some copper services will be aligned with fibre services, namely MPF Amend and MPF Cancellation will each be individually aligned with GEA Bandwidth Modify to 40/10.
- 5.23 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.
- 5.24 To give effect to these decisions, we have set out alignment requirements in Conditions 7A, 7B and 7C, specifically:
- Condition 7A.7 for copper services being aligned with other copper services;
  - Condition 7B.5 for fibre services being aligned with other fibre services; and
  - Condition 7C.5 for copper services being aligned with fibre services.

### Summary tables

- 5.25 Tables 5.1, 5.2 and 5.3 below outline the specific parts of the conditions which set out the charge control caps and formulae relevant to each rental service.

**Table 5.1: Charge control caps and formulae for copper and fibre rental services**

Rental service	Charge control for 2018/19	Controlling Percentage	Percentage Change
MPF SML1 Rental	Condition 7A.2(a)	Condition 7A.6	Condition 7A.4
GEA FTTC 40/10 Rental	Condition 7B.2(a)	Condition 7B.4	Condition 7B.3
GEA FTTP 40/10 Voice and Data Rental	Under Condition 7B.5, alignment of charge with FTTC 40/10 Rental + MPF SML1 Rental where FTTC 40/10 is not available in the relevant geography		
GEA FTTP 40/10 Transition Rental	Under Condition 7B.5, alignment of charge with FTTC 40/10 Rental where FTTC 40/10 is not available in the relevant geography		

Source: Ofcom

**Table 5.2: Charge control caps and formulae for LLU (MPF and SMPF) ancillary services**

Basket/service	Charge control for 2018/19	Controlling Percentage	Percentage Change
MPF Single Migration	Condition 7A.2(b)	Condition 7A.6	Condition 7A.4
MPF Bulk Migration	Condition 7A.2(c)	Condition 7A.6	Condition 7A.4
MPF New Provides basket	See Controlling Percentage column	Condition 7A.6	Condition 7A.3
<i>Sub-cap</i>		Conditions 7A.5 and 7A.6	Conditions 7A.5 and 7A.4

Basket/service	Charge control for 2018/19	Controlling Percentage	Percentage Change
MPF Soft Cease	Condition 7A.2(e) – also applies for 2019/20 and 2020/21	n/a	n/a
SMPF Soft Cease	Condition 7A.2(f) – also applies for 2019/20 and 2020/21	n/a	n/a
Hard Ceases basket	See Controlling Percentage column	Condition 7A.6	Condition 7A.3
<i>Sub-cap</i>		Conditions 7A.5 and 7A.6	Conditions 7A.5 and 7A.4
Special Fault Investigations	Condition 7C.6	n/a – formulae for 2019/20 and 2020/21 provided in Condition 7C.6	n/a
Time Related Charges <sup>156</sup>	Condition 7C.2	Condition 7C.4	Condition 7C.3
LLU tie cables basket	See Controlling Percentage column	Condition 7A.6	Condition 7A.3
<i>Sub-cap</i>		Conditions 7A.5 and 7A.6	Conditions 7A.5 and 7A.4
LLU Co-mingling New Provides and Rentals services basket	See Controlling Percentage column	Condition 7A.6	Condition 7A.3
<i>Sub-cap</i>		Conditions 7A.5 and 7A.6	Conditions 7A.5 and 7A.4
MPF Standard Line Test	Condition 7A.2(d)	Condition 7A.6	Condition 7A.4
Cancellation of MPF orders	Under Condition 7A.7, alignment of charge with Amend MPF orders Under Condition 7C.5, alignment of charge with VULA Bandwidth Modify to 40/10 – see Table 5.3		
Amend MPF orders	Under Condition 7A.7, alignment of charge with Cancellation of MPF orders Under Condition 7C.5, alignment of charge with VULA Bandwidth Modify to 40/10 – see Table 5.3		

<sup>156</sup> Note that TRCs are services available in relation to both copper and fibre networks.

Basket/service	Charge control for 2018/19	Controlling Percentage	Percentage Change
SMPF Remove Jumper Order Singleton Charge	Under Condition 7A.7, alignment of charge with MPF Remove Jumper Order Singleton Charge		
SMPF Remove Jumper Order Bulk Charge	Under Condition 7A.7, alignment of charge with MPF Remove Jumper Order Bulk Charge		

Source: Ofcom

**Table 5.3: Charge control caps and formulae for fibre ancillary services<sup>157</sup>**

Service	Charge control for 2018/19	Controlling Percentage	Percentage Change
GEA FTTC 40/10 PCP Only Install Connection	Condition 7B.2(b)	Condition 7B.4	Condition 7B.3
GEA FTTC 40/10 Start of Stopped Line Connection	Condition 7B.2(c)	Condition 7B.4	Condition 7B.3
GEA FTTP 40/10 FVA with GEA Connection	Condition 7B.2(j)	Condition 7B.4	Condition 7B.3
GEA FTTP 40/10 Transition Connection	Condition 7B.2(k)	Condition 7B.4	Condition 7B.3
VULA CP to CP Migrations	Condition 7B.2(d)	Condition 7B.4	Condition 7B.3
VULA ceases	Condition 7B.2(m) – also applies for 2019/20 and 2020/21	n/a	n/a
<b>GEA 1 Gbit/s Cablelink</b>			
<i>Connection</i>	Condition 7B.2(f)	n/a	n/a
<i>Rental</i>	Condition 7B.2(h) – both also apply for 2019/20 and 2020/21	n/a	n/a
<b>GEA 10 Gbit/s Cablelink</b>			
<i>Connection</i>	Condition 7B.2(g)	n/a	n/a
<i>Rental</i>	Condition 7B.2(i) – both also apply for 2019/20 and 2020/21	n/a	n/a

<sup>157</sup> The charge controls on GEA (FTTP) ancillaries only apply in areas where the respective FTTP rental is also subject to a charge control. The exceptions to this are the charge controls for GEA (FTTP) CP to CP Migrations, and GEA (FTTP) ceases, which apply in all areas regardless of the existence of a charge control on FTTP rentals. The details of the charge controls for all ancillary services are set out in Annex 23.

Service	Charge control for 2018/19	Controlling Percentage	Percentage Change
GEA Bandwidth Modify to 40/10	Condition 7B.2(e)	Condition 7B.4	Condition 7B.3
VLAN moves applied to GEA Cablelinks	Under Condition 7B.5, alignment of charge with VULA Bandwidth Modify to 40/10		
GEA 40/10 Cancel/Amend/Modify – CRD	Under Condition 7B.5, alignment of charge with VULA Bandwidth Modify to 40/10		
GEA 40/10 Cancel/Amend/Modify – Regrading	Under Condition 7B.5, alignment of charge with VULA Bandwidth Modify to 40/10		
Superfast Visit Assure	Condition 7B.2(l) – also applies in 2019/20 and 2020/21	n/a	n/a
Time Related Charges <sup>158</sup>	Condition 7C.2	Condition 7C.4	Condition 7C.3

Source: Ofcom

## Rules used to determine compliance

### Deficiency and excess provisions

- 5.26 Deficiency and excess provisions set out how any under- or over-recovery in a charge control should be dealt with.
- 5.27 These provisions have been included in previous charge controls and we have decided to use them for the individual services and baskets of services that will be subject to charge controls as part of this review.<sup>159</sup> These provisions are set out in detail in Conditions 7A.6 for copper services (MPF and certain SMPF ancillary services), 7B.4 for fibre services and in 7C.4 for TRCs in the legal instruments in Annex 33. 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.
- 5.28 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 have

<sup>158</sup> Note that TRCs are services available in relation to both copper and fibre networks.

<sup>159</sup> For example, in the 2014 FAMR Statement Volume 2, Annex 29, condition 7A.7 (c) and (d).



therefore decided to continue using deficiency and excess provisions for our WLA charge controls.

- 5.29 As explained further below, Openreach has highlighted an unintended consequence relating to the drafting of our deficiency and excess provisions in the legal instruments at consultation stage, which has been addressed in the legal instruments at Annex 33.
- 5.30 We have also decided 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

- 5.31 We have decided to require BT to supply information in order for us to monitor its compliance with the controls. Consistent with the obligations in place in the previous charge controls, BT will 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 33. BT will also be required to publish non-confidential compliance schedules as set out in Annex 8.

### Specific aspects of the draft legal instruments raised in stakeholder responses

- 5.32 We received a small number of stakeholder responses dealing with the way we proposed to implement our consultation proposals in the draft legal instruments. These related to the following specific aspects:
- a) our BT product definitions;
  - b) the exclusion of discounts for the purpose of calculating compliance with the charge controls;
  - c) the risk of large price adjustments towards the end of a charge control year due to a delay in determining compliance for copper basket controls; and
  - d) the formula for calculating the Controlling Percentage in the case of Deficiency or Excess in the First Relevant Year of the charge controls.<sup>160</sup>
- 5.33 We deal with these issues in turn below.

### BT product definitions

#### *Our proposals*

---

<sup>160</sup> Please note that in this Section we have not addressed:

- stakeholder responses relating to our proposals which have already been dealt within this Volume; and
- stakeholder responses to our WLA Network Expansion Consultation relating to the way in which we proposed to take account of BT's costs of providing universal broadband should it reach an agreement with the UK Government, as it has now been confirmed that such an agreement will not take place.

5.34 We proposed to define the services that would be subject to a charge control by reference to the way in which BT names them on its website. By way of example, the definition proposed for MPF Single Migration was:

**“MPF Single Migration”** shall be construed as having the same meaning as “MPF Connection charge – Singleton migrations (Transfer from WLR/SMPF or Change of CP migrations)” as provided by the Dominant Provider on its website for definitions and explanations of its products”.

*Stakeholder responses*

5.35 Vodafone submitted that our use of BT’s own service names interchangeably with its own descriptions for regulated products “could lead to abuse, particularly if BT later attempts to define new products and variants so as to avoid regulation”.<sup>161</sup> Vodafone considered that we should “replace all BT product names contained in all legal instruments with more neutral terms” and “define the parameters of regulated services on their own terms rather than with reference to BT’s product descriptions”. Vodafone suggested by way of illustration that “in the context of VULA all references to GEA, GEA-FTTC and GEA-FTTP should be substituted with references to VULA, VULA-FTTC or FTTP, where applicable”.<sup>162</sup>

*Our reasoning and decisions*

5.36 Defining charge controlled services by reference to what BT calls them provides clarity and transparency for both BT and stakeholders as to which services are subject to the charge controls.

5.37 Vodafone’s concern that BT might seek to avoid regulation by defining new products and variants is addressed by our material change provisions at Conditions 7A.8, 7B.6 and 7C.7. Specifically, should BT make a material change to any service subject to a charge control (other than to a charge), the legal instruments provide that the charge control conditions continue to have effect, subject to such reasonable adjustment to take account of the change as Ofcom may direct. Therefore, these provisions would also cover instances where a new service is introduced in substitution for the existing service subject to a charge control.

5.38 BT is free to introduce new services under fair and reasonable terms, conditions and charges, provided it continues to offer the existing services that are subject to a charge control alongside such new services. Should BT seek to withdraw the existing services that are subject to a charge control, the material change conditions described above would apply.

5.39 We also note that this approach is consistent with our past practice in the 2014 FAMR Statement.

5.40 We have therefore decided that it is appropriate to continue to define services subject to a charge control by reference to the way in which BT names them.

---

<sup>161</sup> Vodafone response to the March 2017 WLA Consultation, Annex 1, paragraph 1.c.

<sup>162</sup> Vodafone response to the March 2017 WLA Consultation, Annex 1, page 30.

## Discounts for the purpose of compliance calculations

### *Our proposals*

5.41 We proposed that discounts should not be included in the calculations for determining compliance with our WLA charge controls.<sup>163</sup>

### *Stakeholder response*

5.42 Openreach said that time limited special offers should be allowed to count towards the WLA charge control compliance due to:

- a) consistency with Ofcom’s approach in the 2016 BCMR Statement (for example, in relation to Condition 10A.19);
- b) benefits for telecoms providers and consumers, “as it allows Openreach the flexibility to stimulate demand, or incentivise migration from legacy to strategic products”. Openreach argued that “[i]f such special offers cannot be taken into account for the purposes of assessing compliance, the incentives to offer such special offers could be reduced, to the detriment of CPs and consumers”; and
- c) less flexibility to change charges to respond to commercial drivers under the proposed charge control conditions, although Openreach noted that Condition 7 does not prevent it from increasing or reducing prices (and this being reflected in the weighted average price for compliance purposes), where those price moves are not characterised as a special offer.<sup>164</sup>

### *Our reasoning and decisions*

5.43 We do not consider that special offers should count towards the calculations to determine compliance with the WLA charge controls. Responding to Openreach’s points summarised above, we do not consider that because we allowed some discounts to count towards the LLCC compliance, the same approach must necessarily be extended to the WLA market. The market dynamics and the importance of special offers in the BCMR context differ from the WLA market. In particular, in the 2016 BCMR we set charge control baskets encompassing a relatively wide range of services, which justified giving BT a degree of discretion over the price changes it applied to individual business connectivity services within the relevant basket. In that context, it was appropriate to enable BT to use discounts to test the impact of potential permanent price reductions or to make time-limited offers to encourage migration from legacy services.<sup>165</sup> By contrast, there are unlikely to be similar benefits in the WLA market because our approach has been to set individual charge controls rather than baskets for the most important services in terms of total revenue (including MPF and GEA rentals). Where we are setting charge controls for certain services within baskets, this is limited to a set of copper ancillary services that have

---

<sup>163</sup> See Conditions 7A.4, 7A.9(c), 7A.12(cc), 7B.3, 7B.7(c), 7C.3 and 7C.8(c) at Annex 33.

<sup>164</sup> Openreach response to the September 2017 WLA Consultation, paragraphs 129-133.

<sup>165</sup> 2016 BCMR Statement, Volume II, Annex 34, paragraphs A34.31-A34.36.

been grouped on the basis of similar technical characteristics, degrees of substitution, and common costs.

- 5.44 We also note that we are not preventing BT from offering special offers or from changing its prices, and we consider that the charge control conditions provide sufficient flexibility for BT to change its charges, even where special offers do not count towards compliance. In particular, Condition 9.4 enables BT to decrease its prices (whether by way of a special offer or a price change) with 28 days' notice, and to increase its prices with 90 days' notice or 28 days' notice in the case of a special offer coming to an end.
- 5.45 In addition, even if BT chooses not to make time limited special offers (because they would not count towards the calculations to determine compliance with the WLA charge controls), we consider that it still has an incentive to implement the equivalent price changes, which would count for compliance purposes and would offer similar benefits to telecoms providers and consumers. Price changes offer the advantage of a longer notification period before the price increases again, giving telecoms providers more time to prepare for the change (90 days instead of 28 days).
- 5.46 Finally, we note that our decision not to count special offers in the WLA charge control compliance is consistent with our decisions in the 2014 FAMR and 2017 NMR statements.

### **Copper baskets: delay in determining compliance potentially leading to large price adjustments**

#### *Our proposals*

- 5.47 With regard to the baskets of copper services, we proposed that the Percentage Change for each basket at the end of each Relevant Year be determined (inter alia) by reference to revenue accrued during the Prior Year in respect of the individual services forming part of the basket.

#### *Stakeholder response*

- 5.48 Openreach indicated that for price changes to take effect at the start of each charge control year (on 1 April), Openreach's pricing decisions will have been made months in advance (for example, a price change scheduled for 1 April will have been signed off internally the preceding December). Given that revenues are not certain until BT's RFS publication in July each year, Openreach submitted that this may require large price adjustments to apply for the last four months of the relevant charge control year. Openreach further explained that, in the case of price increases, adjustments would be introduced from December given the need to provide 90 days' notice period in such cases. While Openreach accepted the current drafting of the legal instrument as this was the current situation and no practical issues have been experienced to date, Openreach asked "Ofcom to note the issues that this could create and provide comfort that such price adjustments would be acceptable".<sup>166</sup>

#### *Our reasoning and decisions*

---

<sup>166</sup> Openreach's response to Volume 2 of our March 2017 WLA Consultation, paragraphs 344-345.

- 5.49 For the purposes of basket control compliance, the use of Prior Year revenue weights implies that BT faces a degree of uncertainty at the time of making pricing decisions for the start of the following charge control year (bearing in mind the notification periods).<sup>167</sup> However:
- a) This degree of uncertainty is limited to some copper ancillary services which are subject to basket controls. Services we have decided to individually charge control (i.e. all rentals and all fibre ancillary services, as well as some copper ancillary services) are not affected; and
  - b) The degree of uncertainty faced by BT is relatively small as it is likely to have access to more than six months of revenue information (and therefore the respective basket weights) at the time it takes pricing decisions for the start of the following charge control year. Furthermore, given that the prices for most charge controlled services, and specifically for those charge controlled within baskets, should decrease year on year (or remain the same, rather than increase), the applicable notification period is 28 days (rather than 90 days in the case of price increases). This means that pricing decisions are more likely to be taken relatively close to the start of a new charge control year, at a time when Openreach holds more Prior Year revenue information than suggested in its response.
- 5.50 We also note that this approach is consistent with our 2014 FAMR Statement and that, as Openreach also said, no practical issues with Prior Year revenue weights have been experienced to date.
- 5.51 Where BT needs to make large price adjustments in order to comply with the main basket control, it would also need to ensure it complies with other aspects of the charge control conditions (including in relation to basket controls, individual sub-caps, etc.).
- 5.52 In light of the above, we have decided not to change our approach to calculating the Percentage Change in Condition 7A.3 by reference to revenue accrued during the Prior Year in respect of the individual services forming part of each basket.

### **Formula for the Controlling Percentage in the case of Deficiency or Excess**

#### *Our proposals*

- 5.53 As explained above, we proposed to allow the Controlling Percentage between each charge control year to be adjusted to reflect any Excess or Deficiency from the previous year to be carried forward. This would be implemented via Conditions 7A.6(d), 7B.4(d) and 7C.4(d).

#### *Stakeholder response*

- 5.54 Openreach stated that:
- a) It supported our proposal and noted it was consistent with previous charge controls.

---

<sup>167</sup> See Section 3 for our explanations on the use of Prior Year revenue weights.

- b) However, “where there is a price ceiling in the first year of the control (as is the case for some MPF items and all GEA items covered by Condition 7B) the formula cannot simply be applied as set out in these sub-Conditions as there would not be a value for “100%+Cpt-1””. This is because there would not be an X value defined for that year.
- c) To allow any over-compliance against the price caps in the first year of the control to be carried forward, Ofcom should “[convert] the difference between the Initial Charge (the price in effect at 1 April 2017) and the price ceiling into a percentage change. This percentage change will act as a proxy for the controlling percentage in the first year”.<sup>168</sup>

*Our reasoning and decisions*

5.55 As highlighted by Openreach, our draft legal instruments at consultation stage did not fully mirror our proposal to enable BT to carry forward excess compliance for any charge control year into the next charge control year, as the formula for Excess or Deficiency scenarios set out in Conditions 7A.6, 7B.4 and 7C.4 does not work in all situations.<sup>169</sup> We agree with Openreach that if it prices individual services below their applicable charge control ceiling in the First Relevant Year, then the applicable charge controls in the Second Relevant Year and the Third Relevant Year<sup>170</sup> should be adjusted to reflect any excess compliance from the First Relevant Year.

5.56 Therefore, for the purpose of setting the charge controls in the Second Relevant Year and the Third Relevant Year for services that are subject to a price ceiling in the First Relevant Year, we have amended the legal instruments at Annex 33 so that:

- a) as now provided by Conditions 7A.1B, 7B.1A and 7C.1A, where the average charge for the relevant service in 2018/19 is lower than the charge control ceiling set out for that year, the charge control ceilings for 2019/20 and for 2020/21 will be calculated on a different basis. Specifically, the ceiling for 2019/20 will be determined by reference to the charge control ceiling for 2018/19, multiplied by a percentage which takes account of the applicable CPI and the applicable X for 2019/20. The ceiling for 2020/21 will be determined by reference to the charge control ceiling for 2019/20, multiplied by a percentage which takes account of the applicable CPI and the applicable X for 2020/21;
- b) the average charges in 2018/19 and in 2019/20 are to be calculated by reference to the relevant year weighted average charge formula set out in Condition 7A.3, 7B.3 and 7C.3, which is weighted by reference to the number of days in the relevant year during which a specific charge was in effect; and
- c) similarly, the 2019/20 and the 2020/21 charge ceilings will work as weighted averages over the year rather than being fixed at a specific level for the entire year, and will be

---

<sup>168</sup> Openreach’s response to the March 2017 WLA Consultation – Volume 2, paragraph 346.

<sup>169</sup> We note that, apart from MPF SML1 Rental, an over-compliance situation is unlikely to arise in the First Relevant Year as past practice indicates that BT tends to price services at the level of the relevant ceiling set by Ofcom.

<sup>170</sup> Since the draft statement, we have added a formula to enable the calculation of the charge ceiling for the third charge control year in such circumstances, for consistency with our approach in relation to the second charge control year.

calculated by reference to the relevant year weighted average charge formula set out in Condition 7A.3, 7B.3 and 7C.3.

## Corrections and clarifications reflected in the legal instruments

- 5.57 As part of the process of finalising the legal instruments, we have also corrected a number of minor typographical errors<sup>171</sup> and simplified the drafting where appropriate.
- 5.58 We have also clarified the scope of application of our fibre charge controls in relation to FTTP services, clarified our definitions of Cablelink Rentals and clarified how to calculate SFI component charges in 2019/20 and 2020/21.<sup>172</sup>

### FTTP services

- 5.59 As explained in Section 3, we have clarified our policy where BT's FTTP services are available but FTTC services are not available, to require BT to offer some of its GEA-FTTP 40/10 rental services at the same charge as the equivalent GEA-FTTC rental service. BT is not required to offer a GEA-FTTP 40/10 rental service at the charge controlled price for those premises where a GEA-FTTC 40/10 service is available. Condition 7B.5, which aligns FTTP 40/10 rental charges to FTTC 40/10, now reflects this.
- 5.60 In line with this approach, we have also clarified that, in general, the charge controls on GEA (FTTP) ancillaries only apply in areas where the respective FTTP rental is also charge controlled. The exceptions to this are the charge controls for GEA (FTTP) CP to CP Migrations, and GEA (FTTP) ceases, which apply in all areas. We have amended Conditions 7B (in relation to FTTP ancillaries) and 7C (in relation to TRCs) to reflect this decision.

### Definitions for Cablelink Rentals

- 5.61 With regard to our definitions of 1 Gbit Cablelink Rental and 10 Gbit Cablelink Rental in Conditions 7B.10(c) and (d), Openreach stated that these contained "cross-referencing errors" on the basis that there are "no corresponding services described on Openreach's website", and requested that these terms be redefined on a standalone basis.<sup>173</sup> We note that Openreach's website<sup>174</sup> sets out the charges for its GEA FTTP services by way of a table which displays two columns, one titled "Connection", the other titled "Annual Rental",<sup>175</sup> while the equivalent price list for Openreach's GEA FTTC services has recently been

---

<sup>171</sup> These include typographical errors which were identified at Annex 4 of Openreach's response to Volume 1 of our March 2017 WLA Consultation and in Openreach's response to the September 2017 WLA Consultation, paragraph 134.

<sup>172</sup> Since the draft statement, we made some minor corrections and clarifications.

<sup>173</sup> Openreach's response to the September 2017 WLA Consultation, paragraph 137.

<sup>174</sup> Last accessed on 21 February 2018.

<sup>175</sup> See GEA FTTP price list:

<https://www.openreach.co.uk/orgp/home/products/pricing/loadProductPriceDetails.do?data=M80QNeH46o4g6JKGD604vTypQOKfNn%2Beo6vmoVhAQBZZ6rNZujnCs99NbIKJZPD9hXYmijxH6wr%0ACQm97GZMyQ%3D%3D>; GEA FTTC price list: <https://www.openreach.co.uk/orgp/home/products/pricing/loadProductPriceDetails.do?data=0RlviN9gWGKtCdDgaQ8lFObCimFDJOVDZEidKC%2F1wh1Z6rNZujnCs99NbIKJZPD9hXYmijxH6wrCQm97GZMyQ%3D%3D> (accessed on 21 February 2018).

amended to only include a “Connection” column for ancillary services.<sup>176</sup> The “Annual Rental” column for the GEA FTTP price list shows a fee of £”0.00” for 1 Gbit Cablelink and 10 Gbit Cablelink services. We presume that, absent our charge control at £0 on Cablelink rental services, and should Openreach seek to introduce rental fees in future, the above price lists’ tables would be updated to include the services’ respective rental fees.

- 5.62 We have therefore decided to keep the reference to Openreach’s price lists in these definitions, although we have added language in Conditions 7B.10(c) and (d) at Annex 33 to clarify that Openreach does not currently charge rental fees for these services.

### Calculation of SFI component charges in 2019/20 and 2020/21

- 5.63 With regard to how SFI component charges should be calculated in the second and third years of the charge control period, we proposed at consultation stage (as corrected in April 2017) that both the SFI visit component charge and the SFI hourly component charge for 2019/20 and 2020/21 be calculated by using the Controlling Percentage for each of those years which we were proposing for the TRC service for an Additional Hour when BT provides that service on a normal working day.<sup>177</sup>

- 5.64 In effect, as far as the second and third years of the charge control period are concerned, it is irrelevant which TRC service these SFI component charges are linked with in the Legal Instruments. This is because the ‘X’ for the second year is the same for all TRCs, as is the ‘X’ for the third year.

- 5.65 We note that Openreach raised a concern that we proposed to link these SFI component charges to a TRC service in the Legal Instruments that was not strictly equivalent.<sup>178</sup> For greater clarity, we have decided to set out the actual formulae to apply in order to calculate the SFI component charges ceilings in the second and third years of the charge control period.<sup>179</sup>

- 5.66 We have reflected these changes in Condition 7C.6 which is set out at Annex 33.

## Legal tests

- 5.67 We consider that each of the charge controls on copper and fibre rental and ancillary services we have decided to set satisfies the legal tests set out in the Act and is in accordance with our legal duties.

---

<sup>176</sup> See GEA FTTC price list:

<https://www.openreach.co.uk/orgp/home/products/pricing/loadProductPriceDetails.do?data=vzq%2FQaGYa3hVgsB2ZYfjHxzflSuq3px%2FWFtgATP2kPRZ6rNZujnCs99NbIKJZPD9hXYmijxH6wr%0ACQm97GZMyQ%3D%3D> (accessed on 21 February 2018).

<sup>177</sup> Clarifications and corrections to the WLA Market Review consultation document of 31 March 2017, 20 April 2017, [https://www.ofcom.org.uk/\\_\\_data/assets/pdf\\_file/0017/101078/wla-market-review-200417.pdf](https://www.ofcom.org.uk/__data/assets/pdf_file/0017/101078/wla-market-review-200417.pdf).

<sup>178</sup> Openreach response to the September 2017 WLA Consultation, Volume 2, paragraphs 138-140. For further details on SFIs and related stakeholder responses, please see Annex 23.

<sup>179</sup> In the draft Statement we linked the SFI component charges to certain TRC services for the second and third years of the charge control period. For greater clarity, in this Statement we have set out the actual applicable formulae. In practice the charge controls have not changed.



- 5.68 In particular, we set out below why we consider that:
- a) each of the charge controls are authorised pursuant to section 87(9) of the Act, and satisfy the tests in section 88 of the Act and the criteria in section 47(2) of the Act;
  - b) in formulating each of the charge controls, we have complied with our relevant statutory duties, particularly those under sections 3 and 4 of the Act; and
  - c) in formulating each of the charge controls, we have taken utmost account of all applicable recommendations issued by the European Commission under Article 19(1) of the Framework Directive and BEREC Common Positions.
- 5.69 As mentioned above, in order to give regulatory effect to our decisions, we are setting three SMP Conditions under section 87(9) of the Act: Condition 7A (for certain copper services), Condition 7B (for fibre services) and Condition 7C (for SFIs and TRCs and charges straddling both copper and fibre services). The text of these conditions is set out in the Schedule to the statutory notification published under section 48A of the Act in Annex 33.
- 5.70 Given the substantial overlap in our reasoning, we have set out our position on the charge controls for copper and fibre services together below.

### **Copper and fibre charge controls**

- 5.71 The new SMP conditions 7A, 7B and 7C require BT to ensure that its charges for the copper and fibre 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 individual service subject to a charge control.<sup>180</sup>
- 5.72 Our reasons for proposing this particular form of control and the values for X are set out in full in this volume. The first year of the control for all charge controlled services will begin on 1 April 2018. The controls will last for three years, ending on 31 March 2021.

### **Our duties and policy objectives**

- 5.73 We discuss our duties and objectives specific to the copper and fibre charge controls in detail in Volume 1 and Sections 2, 3, and 4 of this Volume. Our opinion of the likely impact of implementing the decisions (as discussed throughout this document) is that the performance of our general and specific duties under section 3 and 4 of the Act is secured or furthered by our decision to adopt the charge controls.
- 5.74 We consider that the charge controls for copper and fibre 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 copper 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.

---

<sup>180</sup> With the exception of a number of ancillary services which are subject to a flat real or nominal cap, set at zero or aligned with other charges.

- 5.75 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.
- 5.76 In making our decisions, we have also sought the least intrusive regulatory measures to achieve our policy objectives and we are removing existing charge controls where we consider that they are no longer necessary.

### **Powers under sections 87 and 88 of the Act**

- 5.77 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 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.
- 5.78 Section 87(9) of the Act authorises the setting of SMP services conditions to impose on the dominant provider:
- a) 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;
  - b) such rules as Ofcom may make in relation to those matters about the recovery of costs and cost orientation;
  - c) such rules as they may make for those purposes about the use of cost accounting systems; and
  - d) obligations to adjust prices in accordance with such directions given by Ofcom as they may consider appropriate.
- 5.79 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:
- a) promoting efficiency;
  - b) promoting sustainable competition; and
  - c) conferring the greatest possible benefits on the end-users of public electronic communications services.
- 5.80 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.

- 5.81 In our opinion, Conditions 7A, 7B and 7C satisfy section 88 of the Act.
- 5.82 In Volume 1 we explain 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 copper and fibre services at an excessively high level and/or price in such a way as to create a margin squeeze in the downstream market.<sup>181</sup>
- 5.83 We also consider that the charge control conditions for copper and fibre are appropriate for the purposes of promoting efficiency and sustainable competition and conferring the greatest possible benefits on the users of public electronic communications services.

### Promoting efficiency

- 5.84 We consider that the conditions for copper and fibre 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 copper and fibre services.
- 5.85 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.
- 5.86 In addition, the charge controls will increase allocative efficiency by bringing prices more in line with costs. The 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 copper and fibre services, we have assumed that BT will have certain underlying efficiency gains.<sup>182</sup> This is the approach that we have applied over charge control periods to encourage efficient investment.<sup>183</sup>

### Sustainable competition and benefits for end-users

- 5.87 We also consider that the conditions for copper and fibre services are appropriate to ensure sustainable competition and to confer the greatest possible benefits on users of public electronic communication services.
- 5.88 As explained in Section 2, 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

---

<sup>181</sup> Volume 1, Sections 9 (fibre) and 10 (copper).

<sup>182</sup> See Section 2 and further details in Annex 19.

<sup>183</sup> We note that the charge controls we are imposing in relation to the PIA remedy (which are set out at Condition 7D of the Legal Instruments at Annex 33) take account of certain PIA related network adjustment costs and productisation costs. As explained in Section 5 of Volume 3, we consider this approach meets the relevant legal tests.

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.

- 5.89 Although part of our charge control for MPF (and SMPF) 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.
- 5.90 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 fibre and full-fibre services.

### Investment matters

- 5.91 In setting the charge controls for copper and fibre 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:
- a) in modelling BT's forecast costs, we have built in a reasonable rate of return on investment;
  - b) we have used a CPI-X form of charge control, which encourages and rewards investment in new, more efficient technologies; and
  - c) we have adopted the anchor pricing approach, which incentivises investment in innovative and more efficient technology.
- 5.92 We have carefully considered whether BT has had a fair opportunity to make a return on its original investment in fibre and if a charge control, as decided for fibre, would be consistent with the fair bet principle, as detailed in Annex 6.
- 5.93 We consider that our charge controls for copper and fibre 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 deliver the services subject to a charge control at a lower cost than we anticipated when setting the charge controls.

### Section 47 of the Act

- 5.94 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:
- a) objectively justifiable in relation to the networks, services, or facilities to which it relates;
  - b) not such as to discriminate unduly against particular persons or a particular description of persons;
  - c) proportionate as to what it is intended to achieve; and

d) in relation to what it is intended to achieve, transparent.

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

### **Objective justification**

5.96 We have set out our conclusions in Volume 1 that BT has SMP in the WLA market and Conditions 7A, 7B and 7C set 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 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.

5.97 The structure of the 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.

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

### **Undue discrimination**

5.99 We are satisfied that the charge controls for copper and fibre 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 relevant condition. The charges are set to ensure a fair return and price level for all customer groups.

5.100 We consider that the 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 controls seek to address that market position, including BT's ability and incentive to set excessive charges for services falling within the controls.

### **Proportionality**

5.101 We are satisfied that the charge controls for copper and fibre 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 identified BT as having SMP. The charge controls that we have set are focussed on ensuring that there are reasonable prices for those access services, which are critical to the development of a competitive market.

- 5.102 We have decided to impose a charge control on BT's GEA 40/10 rental service, whilst permitting continued pricing flexibility on other bandwidths (subject to a fair and reasonable charges obligation), as well as permitting flexibility on FTTP in areas where FTTC 40/10 rental services are available. We consider that these decisions address 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.
- 5.103 Under the 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 have been formulated using information on BT's costs and a consideration of how these costs will change over time.
- 5.104 In addition, we have decided 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. the majority of SMPF services).
- 5.105 We therefore consider that the charge controls for copper and fibre services are:
- a) appropriate to achieve the aim of addressing BT's ability and incentive to charge excessive prices for the services covered by the charge controls;
  - b) 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
  - c) such that they do not, in our view, produce adverse effects that are disproportionate to the aim pursued.

### Transparency

- 5.106 We consider that the charge controls are transparent in relation to what they are intended to achieve. The aims and effects of the charge controls are clear and they have been drafted so as to secure maximum transparency. We consulted fully on the charge control proposals and now set out our analysis of responses to the consultation stage and the basis for our final charge control decisions in this document. Additionally, we have published with our Statement 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.
- 5.107 The text of the conditions has been published in Annex 33 and the operation of those conditions is aided by our explanations in this document.

### Sections 3 and 4 of the Act

- 5.108 We also consider that the charge control conditions for copper and fibre services are consistent with our duties under sections 3 and 4 of the Act.

- 5.109 For the reasons set out above, we consider that the charge controls set out in this document 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 charge controls seek to ensure the availability throughout the UK of a wide range of electronic communications services. In setting 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.
- 5.110 Further, we consider that, in line with section 4 of the Act, the charge controls will, in particular, promote competition in relation to the provision of electronic communications networks, further development of fibre 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

### EU Recommendations

- 5.111 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.
- 5.112 Of particular relevance to the charge control aspects of our review of the fixed access markets are:
- a) the EC’s Recommendation of 11 September 2013 on consistent non-discrimination obligations and costing methodologies to promote competition and enhance the broadband investment environment (the “2013 EC Recommendation”);<sup>184</sup> and
  - b) the EC’s Recommendation of 20 September 2010 on regulated access to Next Generation Access Networks (the “NGA Recommendation”).<sup>185</sup>
- 5.113 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).<sup>186</sup>

---

<sup>184</sup> 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](http://ec.europa.eu/smart-regulation/impact/ia_carried_out/docs/ia_2013/c_2013_5761_en.pdf).

<sup>185</sup> 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>.

<sup>186</sup> Note that we also briefly discuss the 2013 EC Recommendation and the NGA Recommendation in Volume 1, Section 9.

- 5.114 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:
- a) if not modelling an NGA network, it should reflect a gradual shift from a copper network to an NGA network;
  - b) it should apply an asset valuation method that takes into account that certain civil infrastructure assets would not be replicated in the competitive process;
  - c) 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
  - d) 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.
- 5.115 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.
- 5.116 In Section 4 and Annexes 11 and 12, 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 state 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.”<sup>187</sup>

- 5.117 We believe that our continued use of a top-down modelling approach to estimate the cost of MPF (and SMPF) services is consistent with the 2013 EC Recommendation.
- 5.118 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:
- a) to model an efficient network using the latest technology employed in large scale networks;<sup>188</sup>
  - b) to use a bottom-up LRIC+ costing methodology;<sup>189</sup> and
  - c) when modelling a fibre deployment NRAs should include existing infrastructure capable of hosting a fibre network.<sup>190</sup>
- 5.119 We discuss each of these points of detail in Annex 14, but we believe in general that our approach of estimating the cost of GEA services using a bottom-up model and calculating the LRIC+ of an FTTC overlay service is compliant with the 2013 EC Recommendation.
- 5.120 The NGA Recommendation aims to foster the development of the single market by enhancing legal certainty and promoting investment, competition and innovation in the market for broadband services, in particular the transition to next generation access networks. It does so by setting out a common approach for promoting the consistent implementation of remedies with regard to such networks.
- 5.121 In Annex 14, we also note that we have taken utmost account of the 2010 EU Recommendation in developing our approach on the bottom-up model.

### BEREC Common Positions

- 5.122 In considering our decisions 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. We consider the following to be particularly relevant to this Statement:
- a) 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.<sup>191</sup> In particular, the following best practices (BPs):

---

<sup>187</sup> 2013 EC Recommendation, page 22.

<sup>188</sup> 2013 EC Recommendation, page 15.

<sup>189</sup> 2013 EC Recommendation, page 19.

<sup>190</sup> 2013 EC Recommendation, paragraph 32.

<sup>191</sup> 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.

- i) BP3: NRAs should encourage infrastructure competition at the deepest level where it is reasonable, to reduce barriers to entry.
- ii) BP32: NRAs should require SMP operators to provide a reasonable defined level of service.
- iii) BP35b: NRAs should require that the price of the switch does not act as a barrier to the wholesale switching processes happening.
- iv) 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.
- v) BP42: When determining their price regulation, NRAs need to consider that it should incentivise both efficient investment and sustainable competition.
- vi) 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.<sup>192</sup>
- vii) BP44: NRAs should determine the costing methodology, taking into account the prioritisation of the regulatory objectives and prevailing market conditions.
- viii) 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.
- ix) 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 competitive market, where the equilibrium price reflects the cost of efficient service provision.
- x) 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.
- xi) 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.

---

[http://www.berec.europa.eu/files/document\\_register\\_store/2012/12/20121208163628\\_BoR\\_\(12\)\\_127\\_BEREC\\_COMM\\_ON\\_POSITION\\_ON\\_BEST\\_PRACTICE\\_IN\\_REMEDIES\\_ON\\_THE\\_MARKET\\_FOR\\_WHOLESALE.pdf](http://www.berec.europa.eu/files/document_register_store/2012/12/20121208163628_BoR_(12)_127_BEREC_COMM_ON_POSITION_ON_BEST_PRACTICE_IN_REMEDIES_ON_THE_MARKET_FOR_WHOLESALE.pdf).

<sup>192</sup> Note that we also discuss BP42 and BP43 in Volume 1, Section 9.

- xii) 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).
  - xiii) 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.
  - xiv) 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.
  - xv) 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.
- b) BEREC, Common Position on Layer 2 Wholesale Access Products.<sup>193</sup> In particular: CP2: Pricing of L2 WAP (with regard to market 3a).

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

---

<sup>193</sup> 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](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)