Review of BT's Network Charge Controls

Explanatory Statement and Notification of decisions on charge controls in wholesale narrowband markets

Statement

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Contents

Section 1

Summary

1.1 This Statement contains the conclusions of Ofcom's review of network charge controls (NCCs) and the formal legal Notifications to give effect to new NCCs. Ofcom published a consultation on proposals for NCCs on 19 March 2009, referred to in the Statement as the "March consultation".

1.2 We received 14 responses to the March consultation. A list of respondents is included in this Statement at Annex 3.

1.3 This document must be read in conjunction with our March consultation document[1] for the full reasoning of Ofcom's final decisions on the setting of the SMP conditions imposing the NCCs on BT. Our original analysis and proposals for NCC were set out in full in our March consultation. Our conclusions in this statement are drawn from that original analysis and the further consideration we have afforded to each issue after carefully considering each and every response we received to our consultation.

1.4 The NCC review has been managed in close coordination with the concurrent reviews of retail and wholesale narrowband markets. Statements containing the conclusions of these reviews have been published simultaneously with this Statement.[2]

Scope of the NCCs

1.5 The wholesale narrowband market review (WNMR) has concluded that BT has significant market power (SMP) in the markets for wholesale fixed call origination and geographic call termination and that new NCCs should be applied to these services. A summary of the conclusions of the WNMR is at Section 3 of this Statement. Ofcom will therefore apply charge controls, as an appropriate SMP remedy, to the wholesale call origination and call termination services provided by BT. In addition, charge controls will apply to the technical area of interconnection circuits, necessary for the provision of both wholesale call origination and geographic call termination, and to the component in the charges for these services to cover Project Management, Policy and Planning (PPP).

1.6 The following charge controls will be applied to these services from 1 October 2009:

[1] http://www.ofcom.org.uk/consult/condocs/review_bt_ncc/
[2] http://www.ofcom.org.uk/consult/condocs/review_wholesale/statement/

Table 1.1: NCCs to apply from 1 October 2009

Service/technical area/ component	**NCC 2009-2013**	Proposed NCC ranges in the March 2009 Consultation	Current NCC 2005-2009
Call termination	**RPI+3.75%**	RPI+3.25% to RPI+10.5%	RPI-5%
Call origination	**RPI+2.75%**	RPI+2.5% to RPI+9.5%	RPI-3.75%
Interconnection circuits (ISB)	**RPI+3.75%**	RPI+1.5% to RPI+6.5%	RPI-5.25%
PPP	**RPI+1.50%**	RPI+0% to RPI+6.75%	RPI+0.75%

1.7 As shown in Table 1.1, these controls are within the ranges of values published by Ofcom in its consultation document.

1.8 Charges for all of these services are subject to current NCCs which expire at the end of September 2009, and have been subject to this form of regulation since NCCs were first introduced in 1997. The new controls are therefore a continuation of an established approach to regulation of wholesale and interconnection services in markets in which BT has SMP.

Trends in Unit Costs

1.9 The new NCCs will be the first with positive values for X (i.e. RPI+X) allowing the charges for controlled services to rise above the rate of inflation (as measured by RPI). The positive values for X are primarily driven by a shortfall between the volumes forecast for the current NCC (2005 – 2009) and actual outturn volumes for these services. Lower than forecast volumes during the current NCC means that the new NCC will start from a position where BT is not recovering the fully allocated costs (FAC) of the NCC services. The new NCC therefore enables charges to rise to allow BT to recover the FAC of NCC services by the end of the control period (September 2013).

1.10 It is important to understand that the positive values for X do not reflect steeply rising unit costs. Our modelling shows real unit costs for termination and origination as having a gradual downwards trajectory for the next NCC period. To show this, Table 1.2 contains values of X for the new NCCs together with values for X calculated using unit cost trends only.

Table 1.2: Comparison of values of X for new NCCs with values for X based on unit cost trends alone and no increases to cover the shortfall between starting charges and unit costs

Service/technical area/ component	NCC 2009 – 2013	Unit cost trend values of X 2009 – 2013
Call termination	RPI+3.75%	RPI-0.50%
Call origination	RPI+2.75%	RPI-0.25%
Interconnection circuits (ISB)	RPI+3.75%	n/a[3]
PPP	RPI+1.50%	RPI+3.00%[4]

NCC duration

1.11 The new controls will commence on 1 October 2009 and run for four years to 30 September 2013. Ofcom has fully considered the views of stakeholders in setting the duration for the new controls. In addition, we have taken account of relevant developments since we published the March consultation, notably

- BT's announcements concerning its plans for voice services and the continuation of the Public Switched Telephone Network (PSTN) during the life of the new NCC;[5] and
- the adoption in May 2009 by the European Commission of a Recommendation on the regulatory treatment of fixed and mobile termination rates in the European Union.[6]

1.12 We have concluded that BT's plans for extended use of the PSTN should not change our overall approach to modelling. However, we have made some adjustments to the NCC cost model to reflect our conclusions following analysis of information supplied by BT on its network plans.

1.13 Ofcom acknowledges that the NCC cost model is not wholly consistent with the recommended approach set out by the Commission in its Recommendation[7], and that the ending of the new NCC (30 September 2013) falls nine months after the end date for transition to the Commission's recommended approach (31 December 2012).

[3] We have not calculated unit cost trends for the ISB since it comprises a mix of services with different cost components. Furthermore, the services have different basket weights. As a result of these factors, a single unit cost trend figure would not be helpful for the purpose of the analysis in Table 1.2.
[4] Note that the unit cost trend for PPP is higher than the NCC. This is because in contrast to origination and termination, starting charges are currently above the level of modelled FAC.
[5] BT published Bulletins in April and July on its secure Consult21 website which is available to other CPs on registration http://www.btplc.com/21CN/Theroadto21CN/Consult21/Consult21.htm
[6] http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:124:0067:0074:EN:PDF
[7] The Commission Recommendation sets out that termination service charges should be set by reference to pure long run incremental costs (LRIC) and costs modelled on the basis of next generation network (NGN) infrastructure whereas the NCC has been set using a hypothetical ongoing network model.

1.14 We have taken utmost account of the Recommendation and weighed this nine month overrun very carefully against the benefits of a four year control which were explained in the consultation document – notably the dynamic efficiency benefits of a longer control. In addition we have considered the problems associated with de-linking the regulation of call termination from the broader NCC package, and the potential impact on the NCCs of shortening the control (i.e. shortening the control would increase the values of X other things being equal).

1.15 We will continue to engage positively with stakeholders on call termination issues – both nationally and at the European level – through the wholesale mobile voice call termination market review currently underway[8] and in subsequent relevant regulatory proceedings.

Cost modelling

1.16 As explained in the consultation document, Ofcom has developed a hypothetical ongoing network cost model to set the cost base for the new NCCs. Consistent with the approach adopted for the current NCCs, our model uses fully allocated current cost (FAC CCA) data from BT's Regulatory Financial Statements (RFS) as inputs. In consultation, Ofcom explained that it had made some adjustments to BT's RFS data consistent with the hypothetical ongoing network methodology.

1.17 The model was designed to meet Ofcom's objectives by providing efficient network investment signals, and by protecting end users and competing Communications Providers (CPs) in downstream markets from excessive pricing. In particular, we sought to avoid the risk of inefficient parallel running costs being passed on to consumers during the migration between the PSTN and BT's next generation network (which BT commonly refers to as the "21st Century Network" - 21CN).

1.18 As explained above, since the consultation document was published, BT has announced plans to extend the life of its PSTN for voice services. Ofcom has reviewed its cost modelling methodology in light of this development and in response to evidence submitted by stakeholders. Following this review, we have concluded that some adjustments to the model are appropriate to reflect BT's plans for voice services. The key area of the model affected is our assumption on appropriate asset lives for a hypothetical ongoing network.

1.19 Asset lives are used in the model to calculate the depreciation charge. Other things being equal, longer asset lives will cause yearly depreciation charges to be lower. We have adjusted modelled asset lives by calculating a weighted average of the network asset lives in BT's Regulatory Financial Statements for the last five years. This has enabled us to reflect the available empirical evidence of longer use of some assets within the overall framework of the hypothetical ongoing network cost model. This change has increased the length of some component asset lives and in turn has reduced the modelled depreciation charge. The resulting decrease in yearly depreciation has led to lower values of X for termination and origination than in our consultation base case.

1.20 We recognise that the future development of services covered by the NCC during the four year duration of the next NCCs and beyond is uncertain. BT's announcement of new plans for its voice services and extended use of the PSTN has added to the uncertainty over the underlying costs of provision since the precise mix of capital and operational expenditure involved in extension of the legacy PSTN is not yet known. In

[8] http://www.ofcom.org.uk/consult/condocs/mobilecallterm/

these circumstances, we believe that our hypothetical ongoing network cost model remains the most robust option available to us to set efficient charges for NCC services. We believe that the adjustments we have made to our modelling assumptions on asset lives are appropriate to reflect the new evidence on the useful economic lifetime of PSTN assets within a hypothetical ongoing network model.

1.21 In addition to the asset life assumption, two other aspects of the model have been revised in light of developments since the March consultation:

- We have concluded that an efficiency target of 2.5% per annum is appropriate for the NCCs commencing 1 October 2009. This conclusion results from assessment of all the evidence available to us. In particular, a 2.5% efficiency target is consistent with the conclusions of the leased lines charge control (LLCC) for Traditional Interface Symmetric Broadband Origination (TISBO) services. This is important as NCC services and TISBO services are both supplied by BT Wholesale and use the same core transmission network operated and managed by BT.

- The volume forecasts used in the model have also been updated using revised information from BT verified against Ofcom's own forecasts. These revised forecasts increase the volume of network components used by termination and origination services.[9] Higher component volumes cause unit lower costs and subsequently lower values of X for termination and origination.

1.22 The model and changes to it are explained more fully in Section 4 and Annex 2.

[9] For termination and origination these components would include Local Exchange Concentrator, Local Exchange Processor, Remote Local Transmission Link and Remote Local Transmission Length.

Section 2

Introduction

2.1 This Statement contains the conclusions of Ofcom's review of network charge controls (NCCs) and the formal legal Notifications to give effect to new NCCs.

Structure of the document

2.2 The document is structured as follows:

- This section contains a brief introduction to the background of network charge controls, their role, and how their use fits with Ofcom's statutory duties and regulatory principles. This section also explains Ofcom's approach to its impact assessment and equality impact assessment in the NCC review.

- Section 3 summarises the findings of the fixed Wholesale Narrowband Market Review (WNMR). The conclusions of the review are published today simultaneously with this Statement[10]. These include relevant market definitions, identification of the markets in which BT holds significant market power (SMP), and the remedies Ofcom is putting in place – including the identification of charge controls as appropriate remedies in certain markets - to ensure there is no abuse of SMP.

- Section 4 explains the detail of Ofcom's conclusions on NCCs and the methodology used to implement them.

- The associated Annexes comprise:

    - the legal Notifications of the revised regulations necessary to implement the new controls (Annex 1);

    - details of the cost model used to set the new NCCs (Annex 2);

    - a list of the stakeholders who responded to the March consultation (Annex 3);

    - an explanation of the legal framework for NCCs (Annex 4);

    - a list of services covered by the NCCs (Annex 5); and

    - a glossary of the more technical terms used (Annex 6).

The role of NCCs

2.3 The NCCs are one of a range of remedies for SMP, where our market analyses shows there is a risk of the SMP operator (BT) charging prices at an excessively high level. They act as a constraint on excessive pricing behaviour by capping prices at an efficient level of cost plus a reasonable rate of return. The RPI+/-X formula used for the NCCs has been successfully employed by Ofcom and its predecessor Oftel in wholesale, interconnection and retail markets, and by other sector regulators and competition authorities in the UK and abroad. It is a tried and tested means of

[10] http://www.ofcom.org.uk/consult/condocs/review_wholesale/statement/

safeguarding consumers and downstream markets from excessive pricing whilst driving efficiency in the regulated firm which in turn creates efficient pricing signals for the whole industry.

NCC and Ofcom's regulatory principles

2.4 When considering the application of SMP remedies, we are required to follow our statutory duties under the Communications Act 2003. In seeking to fulfil our objectives under Section 3 of the Communications Act, we apply a number of relevant regulatory principles, specifically:

- We operate with a bias against intervention, but with a willingness to intervene firmly, promptly and effectively where required.
- We strive to ensure that our interventions will be evidence-based, proportionate, consistent, accountable and transparent in both deliberation and outcome.
- We always seek the least intrusive regulatory mechanisms to achieve our policy objectives.
- We consult widely with all relevant stakeholders and assess the impact of regulatory action before imposing regulation upon a market.

2.5 The WNMR has identified the need for new charge controls but covering a smaller range of wholesale markets than those currently subject to NCCs. Following our market analysis and subsequent consultation we consider that charge controls are a necessary and appropriate remedy for geographic call termination, wholesale call origination, interconnection circuits and Product Management, Policy and Planning (PPP) in keeping with Ofcom's statutory duties and regulatory principles.

Legal Framework

2.6 In setting any SMP Service condition, Ofcom has to ensure that the proposed condition complies with the various tests set out in the Communications Act 2003 ("the Act"), . The legal framework within which the NCCs are set is explained in full at Annex 5.

2.7 The scope of this review derives its authority from the SMP findings made in the WNMR.[11] That review discussed whether charge controls should be applied as an appropriate remedy to SMP in various markets and concluded that charge controls were an appropriate remedy. This Statement presents Ofcom's conclusions about how those charge controls, as appropriate remedies, should be imposed.

2.8 In setting out our conclusions on how the charge controls should work, we have been mindful of the need to ensure that our methodology remains consistent with the various obligations in the Act. The NCCs have to pass various tests, and we have to ensure that we are acting consistently with our duties under sections 3 and 4 of the Act.

Section 47

2.9 Section 47 of the Act requires that any condition set must be:

[11] http://www.ofcom.org.uk/consult/condocs/review_wholesale/statement/

i. objectively justifiable;

ii. not such as to unduly discriminate;

iii. proportionate; and

iv. transparent.

2.10 Section 47 was considered in general terms in the WNMR as to whether a charge control is an appropriate remedy based upon the identified market failures. This review has therefore concentrated on how the specific mechanics of the control satisfy both the requirements of section 47 and the separate section 88 tests, which are discussed below.

Section 88

2.11 Charge controls, as a price control remedy, are authorised under section 87(9)(a) of the Act. Where a section 87(9) remedy is proposed it must be compliant with section 88 of the Act.

2.12 Section 88(1) requires that such conditions must only be set where there is a relevant risks of adverse effects arising from price distortion and where the condition is appropriate for the purposes of:

i. promoting efficiency;

ii. promoting sustainable competition; and

iii. conferring the greatest possible benefits on end users.

2.13 In addition, under section 88(2), we must take account of the extent of the investment made by the Dominant Provider.

2.14 Section 88 is of particular importance when designing a charge control as the choices that are made in determining how the control shall operate will affect how well it meets these requirements. It is important to ensure that the proposals made are such that the control remains appropriate for the purposes set out in s88(1)(b), and 88(2).

Sections 3 and 4

2.15 It may be that charge controls could be set in a number of ways, all of which pass the tests set out in sections 47 and 88. It is therefore important to consider the impact of any proposals against our general duties under section 3 of the Act and our obligations under the Community requirements, as set out in section 4.

2.16 The principal section 3 duty requires us to further the interests of citizens in relation to communication matters and to further the interests of consumers, where appropriate by promoting competition.

2.17 Section 4 obliges us to act in accordance with the six Community requirements. Article 8 of the Framework Directive sets out policy objectives and regulatory principles which member states shall take all reasonable measures to achieve. Where there is conflict between our section 3 general duties and our obligations under section 4 the latter has precedence.

Impact assessment

2.18 The analysis presented in the sections and annexes of this Statement represents an impact assessment as defined in section 7 of the Act. Impact assessments provide a valuable way of assessing different options for regulation and showing why the preferred option was chosen. They form part of best-practice policy making. This is reflected in section 7 of the Act which requires that generally Ofcom has to carry out impact assessments where its proposals would be likely to have a significant effect on businesses or the general public, or where there is a major change in Ofcom's activities. However, as a matter of policy, Ofcom is committed to carrying out and publishing impact assessments in relation to the majority of its policy decisions. For further information about Ofcom's approach to impact assessments, see the guidelines, "Better policy making: Ofcom's approach to impact assessment"[12]

Equality impact assessment

2.19 Equality impact considerations are an integral part of the assessment of the options available to us in policy making. However, we have not carried out separate equality impact assessments in relation to race or gender equality, or equality schemes under the Northern Ireland and Disability Equality Schemes. This is because we do not believe that the policies presented here, which primarily affect wholesale markets, would have a different impact in relation to people of different gender or ethnicity, or consumers in Northern Ireland or on disabled consumers compared to consumers in general.

2.20 Similarly, we have not made a distinction between consumers in different parts of the UK or between consumers on low incomes. Again, we believe the new NCCs will not have a particular effect on one group of consumers over another.

[12] http://www.ofcom.org.uk/consult/policy_making/guidelines.pdf.

Section 3

Wholesale Narrowband Market Review Decisions

3.1 In a separate regulatory statement published today[13] Ofcom has explained the conclusions of the WNMR. The markets included in that review include wholesale conveyance services which will be covered by the new NCCs – wholesale call origination and call termination. The WNMR statement also contains discussion of the technical areas (interconnection circuits) and cost components (Product Management Policy and Planning – PPP) which will also be regulated in the NCCs.

3.2 The WNMR Statement contains a detailed explanation of Ofcom's findings in its analysis of market definition and the existence of Significant Market Power (SMP) in these and other markets. It also identifies and explains the remedies which Ofcom believes are appropriate in wholesale markets where we have identified SMP and presents the economic and policy rationale and legal justification for them. The NCCs are one such remedy. The detailed design and implementation of the NCCs are covered in this document.

3.3 Hence, the scope of the proposed new NCCs is defined by the WNMR, and the detailed design of the NCCs is covered in this document. For ease of reference, the conclusions of the WNMR as they relate to NCC scope are summarised here.

Market definitions and SMP findings

Wholesale call origination

3.4 Ofcom has identified markets for wholesale call origination.

3.5 Ofcom has concluded that markets for call origination are technology neutral. They cover the network from the point of connection of the exchange line on a fixed narrowband network to the first point where access is available to other CPs for interconnection. This technology neutral definition is generic for call origination on both the PSTN and NGN architectures.

3.6 Ofcom has identified that BT has SMP in the market for wholesale call origination in the UK outside of the Hull area, and that KCOM has SMP in the market for wholesale call origination in the Hull area. Specifically, we found that there was a risk of BT having the ability and the incentive to price excessively, and therefore a need to set a charge control as an appropriate remedy.

Fixed geographic call termination

3.7 Ofcom has identified markets for geographic call termination.

3.8 Ofcom has concluded that markets for call termination are technology neutral. In terms of call routing, call termination is essentially the mirror image of call origination and hence the market also covers the network from the point of connection of the exchange line to the first point where access is available to other CPs for

[13] http://www.ofcom.org.uk/consult/condocs/review_wholesale/statement/

interconnection. This technology neutral definition is generic for call termination on both the PSTN and NGN architectures.

3.9 Separate markets exist for termination on all fixed networks in the UK. Ofcom has identified that SMP exists in the provision of termination to geographic numbers on all of these networks and hence any CP which terminates this traffic has SMP. Ofcom has published a list of these terminating CPs in the WNMR statement.[14] Additonally, in relation to BT only, we found that there was a risk having the ability and the incentive to price excessively, and therefore a need to set a charge control as an appropriate remedy.

Remedies

3.10 Ofcom is imposing the following remedies in these markets.

Wholesale call origination

3.11 As a result of its SMP findings on both BT and KCOM in call origination markets, Ofcom has decided to impose conditions on BT and KCOM, specifically:

- requirements to provide network access, to publish a Reference Offer, to notify charges, to notify technical information, no undue discrimination, cost accounting and accounting separation;
- the provision of carrier pre-selection (CPS) and indirect access (IA); and
- cost orientation.

3.12 In addition, Ofcom has decided that call origination on BT's network be subject to:

- a process for requesting new network access;
- a call origination obligation for number translation services (NTS); and
- a charge control.

Wholesale call termination

3.13 As a result of its SMP findings on all terminating CPs in geographic call termination markets, Ofcom has decided that all terminating CPs be subject to a requirement to provide network access on fair and reasonable terms. Ofcom is consulting on whether an obligation to publish charges will apply to all terminating CPs. Details on this can be found in the WNMR statement.[15]

3.14 Ofcom has decided that the following remedies also be applied to call termination on BT's and KCOM's networks:

- cost accounting and accounting separation;
- requirement not to unduly discriminate;
- requirement to set cost oriented charges;

[14] http://www.ofcom.org.uk/consult/condocs/review_wholesale/statement/
[15] http://www.ofcom.org.uk/consult/condocs/review_wholesale/statement/

- requirement to publish and notify charges; and
- requirement to publish a Reference Offer.

3.15 In addition, Ofcom has decided that a charge control be applied to BT's charges for call termination.

NCC scope

3.16 These conclusions from the WNMR mean that the scope of the new NCCs is:

- wholesale call origination on BT's network; and.
- wholesale geographic call termination on BT's network.

3.17 In addition, Ofcom has identified the need to impose charge controls on interconnection circuits – the circuits which provide the physical connection between interconnected networks. Interconnection circuits are a necessary facility for interconnection and hence are regulated as a 'technical area' needed for the fulfilment of BT's obligations under remedies imposed in SMP markets.

3.18 In this statement, Ofcom has also imposed a control of BT's charges for Product Management, Policy and Planning (PPP) activities related to regulated products. This includes administration overheads, marketing activities directly related to the regulated products, customer service management for these products and billing and finance activities.

Further consultation on specific wholesale narrowband markets

3.19 Responses to the WNMR raised a number of issues in relation to specific markets which required further analysis. As such, the WNMR will also contain a re-consultation on the following issues:

- Wholesale transit services: in the March consultation on the WNMR we proposed that Inter-tandem conveyance/transit and single transit were in same market and that BT no longer had SMP in this transit market (Inter-tandem conveyance/transit was deemed competitive by Ofcom in 2005). Based on responses to consultation, we are re-consulting on a proposal that they are separate markets and that BT has SMP in single transit. We are also consulting on options for appropriate remedies, although it is not proposed that a charge control should be applied to this market.
- The obligation for CPs other than BT and KCOM to publish charges for fixed geographic call termination: in the March consultation we suggested it would not be proportionate to impose an obligation on CPs other than BT and KCOM to publish prices. The statement will consult on imposing this obligation in the light of the potential impact of de-regulation in other markets.

3.20 We will also be re-consulting on market definition, market power determination and the appropriateness of remedies in relation to ISDN30 in a further separate consultation shortly. For the avoidance of doubt, none of the issues which remain open for the consultation in the WNMR statement will affect the new NCCs.

Section 4

The Network Charge Controls

Introduction

4.1 In this section we explain the detail of our conclusions from the NCC review, and the new NCCs which will take effect on 1 October 2009.

4.2 The new NCCs are the result of analysis by Ofcom of the evidence it has gathered in composing its initial proposals, subsequently, and submitted by stakeholders in their responses to consultation.

Detailed explanation of the charge controls

Hypothetical ongoing network model

Our proposal

4.3 In the March consultation we explained that we preferred to use a technology neutral model rather than explicitly model two networks and the migration between them (i.e. a PSTN that will eventually be phased out and a 21CN voice platform that is being built). The main reasons for choosing the technology neutral model instead of modelling the two networks running in parallel were:

- the considerable uncertainty over 21CN costs, replacement services, and migration patterns; and
- explicitly modelling two different networks might distort incentives with regard to the efficient migration of traffic and services from one network to the other.

4.4 Our cost model is designed around proven technology used to deliver the relevant wholesale narrowband voice services, i.e. BT's PSTN network. However, the cost model is hypothetical in that it assumes:

- first, as noted previously, that all traffic is carried on this network throughout the control period; and
- second, that the capital costs (i.e. depreciation and cost of capital employed) and operating costs of the network are at the efficient levels that would be expected if the network were in an ongoing environment.

4.5 We have developed the technology neutral cost model assuming a hypothetical ongoing network based on PSTN components. We have used this model to determine the level of network charges.

Consultation responses

4.6 In the consultation document, we asked whether stakeholders agreed with the use of a hypothetical ongoing network cost model. Although all respondents agreed that it is better to use a technology neutral model (as opposed to modelling two parallel networks) there were differing opinions on the base to use to construct the model. Broadly, consultation responses regarding the use of the hypothetical ongoing network model can be grouped into four categories:

- Some respondents agreed with us that it is best to use a hypothetical ongoing network and that it should be based on PSTN components. One respondent suggested that we review this assumption during the charge control period if BT's 21CN costs require this.

- A few respondents suggested that we use a hypothetical ongoing network based on 21CN components. One respondent, in particular, suggested that incentives for 21CN investment would be strengthened if the NCCs were set using a NGN cost model as these rates would, in the respondent's view, be lower than the charges proposed by us.

- One respondent suggested that we take a different approach to modelling a hypothetical efficient network. In particular, this respondent suggested a scorched node model where the location of some network nodes is fixed, and the most efficient technology option can then be selected to configure the network around these nodes. The respondent suggested that this approach would take into account that declining traffic needs a smaller network. The most efficient technology could then either be PSTN or NGN, depending on which is cheaper for the specific network infrastructure.

- Some respondents thought that using a hypothetical ongoing PSTN model allows BT to recover more costs than justified and therefore suggested using a PSTN model with declining volumes and re-use of assets. They argued that volume declines release network equipment that can be re-used rather than having to purchase new equipment to replace a worn out network.

Our analysis and conclusions

4.7 As we explained in the consultation document, we do not have sufficient information to construct a robust 21CN cost model. There is considerable uncertainty regarding technology solutions, network architecture and services that will be offered on the new platform, and it is therefore not possible to take a robust view on underlying costs at this time. Moreover, we are not aware of any national fixed network operator of comparable scale to BT with a complete next generation voice network that we could use as a benchmark to build a UK specific 21CN cost model. As a consequence we believe it unlikely that these uncertainties will be resolved for some considerable time, a view reinforced by BT's recent 21CN announcements. We thus consider that the hypothetical ongoing network model is likely to remain relevant for the duration of the NCC.

4.8 A scorched node model would re-dimension the network for declining traffic volumes. In fact, our cost model does take into account that lower volumes of traffic require less network equipment through declining Gross Replacement Costs. Indeed, we do not project unit cost increases for termination and origination despite declining volumes (as shown in Table 1.2 of Section 1).

4.9 After the March consultation was published, BT announced changes to its plans for voice services, including an extension of use of the PSTN (this is discussed in further detail below and adaptations to the NCC cost model to reflect this are also explained in Annex 2). Respondents had the opportunity to comment on the changes, and their relevance for the NCC proposals, in their responses to consultation. Some respondents suggested that we use a cost model with heavily depreciated PSTN assets to reflect BT's new approach. We have considered the advantages and disadvantages of such a model compared to those of a hypothetical ongoing network based on PSTN components. In order to make the comparison it is important to

discuss further developments to BT's plans to migrate its customers to a 21CN voice platform.

BT's plans for its voice services

4.10 BT has announced changes to its plans for deployment of an IP voice platform in its 21CN. In particular, our understanding is that BT's plans to migrate voice services to the 21CN platform will be at a slower pace than previously envisaged[16], so the extent of migration within the four year duration of the new NCC is uncertain and may not be significant.

4.11 We have investigated BT's current plans and reviewed the most recent BT documents on this issue. We understand that BT is currently discussing various scenarios with its suppliers and contractors and trying to decide on the optimal investment path to follow. Our understanding is that BT's expenditure profile and mix between capital expenditure (capex) and operational expenditure (opex) may now differ from that assumed when we prepared our hypothetical ongoing network cost model in the March consultation. It now seems likely that 21CN capex will be scaled back in the medium-term, but that there may be some continued capex on PSTN equipment and likely additional opex to prolong the life of the PSTN. Unfortunately given the significant uncertainty about the cost of the different options, we are not in a position to estimate with any degree of precision at this point in time what BT's actual costs would likely be. However, a key motivation behind our hypothetical ongoing network approach to cost analysis is that it avoids us having to predict with accuracy the expected actual mix of capital and operating costs for each network. What matters is whether our model generates an economically efficient path of prices given total unit costs irrespective of how the total unit costs would precisely breakdown between capital costs (further split between PSTN and 21CN) and operating costs (including any costs associated with the parallel running of two networks).

"Legacy network extension" versus a hypothetical ongoing network cost model

4.12 Ofcom has considered whether it is appropriate to move the cost modelling approach away from the hypothetical ongoing approach and towards a model based on the extension of the legacy PSTN and deferral of 21CN investment, hereafter referred to as a "legacy network extension model". This type of approach was advocated by some stakeholders following the announcement by BT of its plans for voice services.

4.13 The key difference between the hypothetical ongoing network model and a legacy network extension model is that, in the first BT is assumed to invest in asset renewals and enhancements in the usual way, while in the second efforts are focussed on maintaining and repairing existing equipment only. The first assumption is consistent with an operator that expects long term use of the network, and the second strategy is most likely if it is planning to use the network in the short to medium run only.

4.14 A legacy network extension strategy might be cheaper in the short run as it entails less capex. However, in the medium and long run it is likely to be more expensive as opex rises to maintain PSTN assets approaching the end of their useful economic lifetimes. Moreover, delaying investment in new equipment may postpone productive

[16] BT published Bulletins in April and July on its secure Consult21 website which is available to other CPs on registration: http://www.btplc.com/21CN/Theroadto21CN/Consult21/Consult21.htm

efficiency improvements which new equipment can deliver, thereby making efficiency improvements in the medium to long run more difficult to achieve.

4.15 As the legacy network extension programme becomes less sustainable (as assets approach the end of their feasible economic lifetimes), significant capex for renewals and enhancements is necessary, as is decommissioning of the old network and migration of traffic. At this point ongoing network unit costs return to a stable ongoing network level.

4.16 In the medium to long run, the path of unit costs (assuming constant volumes) implied by a legacy network extension modelling approach might exhibit four phases:

- First, flat or falling unit costs as assets become fully depreciated and opex remains relatively unchanged;
- Second, rising opex as failure rates and maintenance rise possibly off-setting the savings from reduced capital costs as assets are fully depreciated;
- Third, a potential sharp rise in unit costs as capex for the replacement network is needed and parallel running costs are incurred; and
- Fourth, a decline in unit costs once the old network is fully decommissioned and all traffic is carried on the new network.

4.17 For cost modelling purposes an accurate view on the timing and duration of each of the above phases would be needed. In particular, over the next four years, while BT's current plans suggest that migration to 21CN is unlikely, we have no robust information on whether pure legacy network extension (the first phase above) would remain viable or sustainable (or whether the second and third phase would also start). Moreover, setting a charge control on the basis of legacy network extension may involve an implicit expectation that when the period of parallel running, decommissioning and migration happens, such costs can be recovered. However, setting charges in this way is unlikely to give good incentives to BT to minimise the period and costs of parallel running and decommissioning.

4.18 Overall, a more efficient and less volatile path of prices is likely to follow from a hypothetical ongoing network cost model which abstracts both from both legacy network extension and the need to model explicitly 21CN investment, parallel running and PSTN decommissioning.

Investment incentives and cost recovery

4.19 Ofcom has considered the impact on investment incentives of its hypothetical ongoing network approach and potential modifications to it.

4.20 One respondent, in particular, suggested that incentives for 21CN investment would be strengthened if the NCCs were set using a NGN cost model as these rates would, in its view, be lower than the charges proposed by us. We do not agree with this view. We believe that if the investment in 21CN is overall likely to be profitable for BT compared to delivering the same services on its existing network, then BT will always be incentivised to make the investment.

4.21 However, if the short run legacy network extension costs of the PSTN are lower than the ongoing long-run costs of the 21CN and charges are set on the basis of the former costs for a sustained period (i.e. a four year charge control), this would imply a

path of charges inconsistent with the underlying efficient path of unit costs and would dis-incentivise efficient investment in the medium to long run.

Adjustments to the hypothetical ongoing network model

4.22 We have made changes to three key areas of the model on which we consulted, namely asset lives, volumes and efficiency.

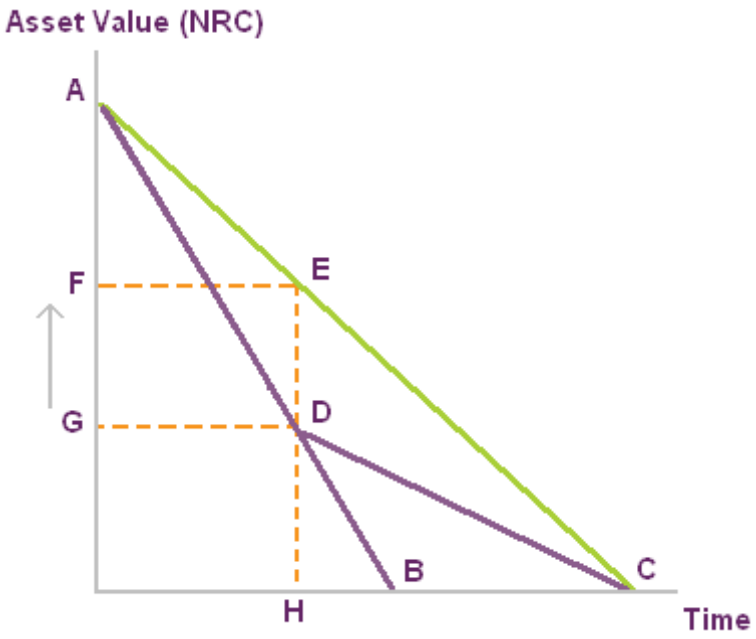
Asset Lives

4.23 In light of evidence on increased economic lifetime of PSTN equipment, Ofcom has decided to revise its asset life assumptions from those used in the March consultation.

4.24 As discussed in Annex 2, the asset lives are used to calculate operating capability maintenance (OCM) depreciation, which contributes to the yearly capital costs in the model. Although Ofcom's model is hypothetical it is designed around PSTN components. Given that BT has used some of its PSTN assets for longer than originally planned, and plans to use them for longer, we consider it appropriate to adjust our starting asset life assumptions. However, we do not plan to increase the asset lives to the level currently implied by BT's Regulated Financial Statements (RFS). There are two key reasons why we would not wish to use the asset lives implied by BT's RFS.

- The first reason is that the RFS implied asset lives are unlikely to reflect the true economic lives of the assets. When BT changes the asset lives in the RFS it spreads the remaining value of the asset over the remaining (now extended) life of the asset. This will cause the yearly depreciation to be lower than if the asset had always been depreciated assuming the (economically) correct asset lifetime. This effect can be illustrated as follows in Figure 4.1

Figure 4.1 Asset depreciation



The asset is originally being depreciated along line AB. The slope of this line is the OCM depreciation. At point D we realise that the asset life is too short. Under

BT's RFS methodology, the remaining asset value (G) is spread over the remaining asset life (line DC). If the correct asset life had been used for the entire period we would have been on line AC. Note that the line AC has a different slope (yearly depreciation) than the line DC. The line DC shows a considerably lower depreciation charge than the line AC. If we calculated the implied asset life from the line DC (GRC/OCM) we would get longer asset lives than those implied by line AC, which would be the correct asset lives (from an economic point of view). In effect BT has depreciation charges from the line DC in its RFS.

- The second reason is that even if the asset lives in the RFS were correct, for modelling consistency we would also have to take the other base year data from the same source (i.e. BT's RFS). Using this data would move us away from a hypothetical ongoing network model and towards a legacy network asset extension model with attendant risk in projecting opex levels, as well as raising the complexity of how to capture 21CN investments already made and those yet to be made. As has been discussed previously, a legacy network model also has the potential to provide inefficient investment signals to BT. A further discussion of this point can be found in Annex 2.

4.25 The new asset lives in our model are calculated as a weighted average of the implied asset lives (GRC/OCM depreciation) from the last 5 years from BT's RFS (see Annex 2 for details). Our new asset life assumptions are designed to better reflect what we believe to be realistic economic asset lives in an ongoing network. Therefore, the approach to other key model design features, in particular opex modelling, will continue to be that used in the March consultation and has not been adjusted. In other words we have not increased modelled operating costs to reflect increases which might occur as a result of BT's recent announcements on its 21CN. Further explanation of this, including analysis we have performed to validate this approach is contained in Annex 2 (see paragraphs A2.44 – A2.49).

4.26 We have also considered whether we should make any other adjustment to the hypothetical ongoing network model in light of the revision to asset lives. In particular, we have also considered whether any adjustment to asset values or efficiency is necessary. Our detailed reasoning on these points can be found in Annex 2. In summary, we consider that the adjustments previously made to the model base year data are sufficient to create a steady state ongoing network, and no further changes have been made to either asset values or efficiency as a result of our revision to the asset life assumptions.

4.27 The consequence of a change in the asset life calculation methodology is an increase in the life of a number of components. The resulting change in the lives for those components used in the termination and origination services can be seen in Annex 2 Table A2.9. When the component life increases without any other modelling adjustment, the OCM depreciation decreases causing lower yearly capital costs. This results in lower (positive) values of X in the glide path formula.

Volume Adjustment

4.28 In the March consultation we reported the volumes used in the NCC model. These volumes were provided by BT and showed the decline in the total traffic on BT's network as 24% during the next charge control period. BT has provided us with an updated version of these forecasts. These new forecasts show a larger decline in total volumes on BT's network. Despite the decline in total network traffic volumes, there has been an increase in the forecast for those calls that use the termination

and origination services. As such, the effect of these new volume forecasts is to decrease the termination and origination Xs. Details of these volume changes and their impact on the Xs can be found in Annex 2.

Efficiency

4.29 In the consultation document, we explained our proposals for the efficiency input to the hypothetical ongoing network model. The efficiency factor captures how much we expect BT's unit costs to fall for a given level of output over the charge control period. The key driver of increased cost efficiency is productivity growth which measures how much BT's output will grow for constant inputs or, equivalently, the extent to which the same output can be delivered using fewer inputs.

4.30 We want to set NCCs in a way that encourages BT to operate as efficiently as possible. One of the main benefits of charge controls as opposed to rate of return regulation is that it creates incentives on the charge controlled firm to increase its efficiency, by allowing it to keep any profits that it earns by realising greater efficiency savings than those assumed in the cost forecasting model.

4.31 Conceptually there are two types of efficiency adjustments:

- *catch-up adjustment*: the relative efficiency of a regulated firm against an efficient comparator at the beginning of the control period, and

- *frontier shift adjustment*: annual cost reductions with constant volumes driven by overall sector productivity improvement.

Catch-up adjustment

4.32 As explained in the consultation document, in order to estimate catch-up, US Local Exchange Carriers (LECs) have typically been used in statistical analyses as benchmark comparators to BT. This is the approach established by previous NCCs and other BT charge controls (e.g. the Leased Lines Charge Control - LLCC). Under this approach an efficient frontier is estimated based on how costs are affected by various exogenous effects such as the number of switched minutes, population density and so on. BT's efficiency is compared to this frontier, and the catch-up adjustment is simply the percentage by which BT's costs are above the costs of a hypothetical identical company that operates on this frontier. If BT is among the best of the comparator firms in terms of efficiency or if it is more efficient than the best comparators then BT is considered to be at the efficiency frontier and thus there is no need to apply a catch-up adjustment.

4.33 Ideally, we would like to have catch-up estimates for the set of services that are covered under the NCC. However, to our knowledge, there are no catch-up estimates for BT's core network only. The reason for this is that it would be very difficult to find comparator companies to BT Wholesale. In particular, the LECs are imperfect comparators because access and core network costs are not separated in their accounts whereas BT Wholesale and Openreach are structurally separate entities. However, any attempt to separate the costs of LEC's for access and core for the purposes of such an exercise would not be robust or reliable. Therefore, as the best available proxy for NCC services, we have used benchmark comparisons between BT's whole network and the LECs to measure the catch-up requirement for BT in the NCC.

Frontier shift adjustment

4.34 Frontier shift estimations are typically based on historical cost trends. We expect past cost reductions to indicate how the production frontier will change over time. Past frontier shifts can be calculated using data for a larger set of companies or using data only for BT. Using data for several companies helps us to smooth out any fluctuations in BT's costs. Using data for BT only, on the other hand, ensures that we calculate a trend that gives a more UK network specific prediction for the future. Also, using BT's historical data we can concentrate specifically on the set of services that are covered by the NCCs.

Empirical evidence

4.35 In the consultation document we explained the sources we used to analyse BT's efficiency. These were:

- A comparative efficiency study prepared for Ofcom by NERA as part of the Openreach Financial Framework (OFF) project. This report was completed in March 2008 and was published as part of the LLCC in December 2008.[17]

- BT submitted a report by the consultancy Deloitte (completed also in March 2008) as a response to the Ofcom consultation on the Openreach Financial Framework (OFF). The report is confidential and so is not published, but the results are cited in the LLCC consultation document and in a further analysis by NERA noted below.

- NERA prepared an additional note in May 2008 discussing the Deloitte study. This note was published in December 2008.[18] It reconciles the differences between the NERA and Deloitte approaches.

- We identified that the 2005 NCC consultation range of efficiency adjustments may also be informative for this NCC review. Catch-up estimates obtained in 2004-2005 are no longer relevant as BT's relative efficiency is likely to have changed since then. Frontier shift for the 2005 NCC consultation was calculated using BT's historical cost data (1999/2000 to 2003/2004) net of catch-up over the same period and remains a useful point of reference.

- Ofcom's consultation document on the LLCC contained an estimate of frontier shift for leased lines. Although the leased lines analysis was not done for NCC services specifically, the LLCC consultation findings were used to cross-check the efficiency range we proposed to use. The LLCC efficiency estimates for Traditional Interface Symmetric Broadband Origination (TISBO) services are highly relevant to the NCC since NCC services and TISBO services are provided by BT using the same underlying network infrastructure.

Our proposal

4.36 In the March consultation we examined the evidence available to us at that time and concluded that BT was no less efficient than efficient comparator companies. Therefore we did not propose any catch-up adjustment.

[17] The Comparative Efficiency of BT Openreach, a Report for Ofcom, NERA 17 March 2008, http://www.ofcom.org.uk/consult/condocs/llcc/efficiency.pdf

[18] Comments on the Deloitte paper on "The efficiency of BT's network operations", NERA, 6 May 2008, http://www.ofcom.org.uk/consult/condocs/llcc/operations.pdf

4.37 We also explained that we proposed an annual frontier shift productivity improvement in the range 1-3% based on the sources and studies above. Our base case was 2%.

Consultation responses

4.38 BT noted that it was at the benchmark efficiency frontier and that this should be taken into account in calculating future frontier shift requirements. In particular, BT suggested that because the statistical analyses of efficiency indicated that BT was more efficient than the upper decile threshold of comparator companies, BT would not be able to achieve as high frontier shift as the average of the comparator companies.

4.39 Another respondent also suggested that Ofcom may have overestimated the extent to which BT can make efficiency gains over the period of the NCC, especially as volumes are forecast to fall.

4.40 Two respondents suggested that NGN efficiency improvements should be taken into account.

4.41 Other respondents provided information to suggest that further efficiency improvements than those suggested by Ofcom in March were possible for BT. Most of this information was anecdotal evidence to suggest that BT is not as efficient as the statistical comparisons suggest. We were also referred to BT's published plans[19] to reduce costs in the near future.

4.42 Another respondent suggested that we use European benchmarks instead of relying on statistical analysis based on US firms.

Our analysis and conclusions

4.43 In order to have a better view of the issues suggested by the respondents we asked BT to provide us with a breakdown of planned efficiency savings and how these would impact the cost of services covered by the NCCs. We have used this, together with information submitted by respondents, to review the analysis and proposals on which we consulted.

4.44 Whilst data provided by BT on planned efficiency savings was consistent with the existence of opportunities for productivity gains during the next charge control period, it is not possible to accurately attribute any of these to NCC services specifically.

4.45 Information submitted by other CPs was also consistent with the existence of opportunities for productivity gains in the period. However, it has not been possible to identify how such gains could be robustly attributed to NCC services specifically.

4.46 We have therefore used the benchmarking studies referred to above, and the work undertaken in the LLCC, to guide our conclusions on the efficiency input to our modelling.

4.47 The LLCC is particularly significant as the frontier shift requirement for TISBO services can be regarded as being a good proxy for NCC services. This is because BT's core Time Division Multiplexing (TDM) infrastructure is used to provide both

[19] See BT's financial results, Q4 2008/9 at http://www.btplc.com/news/articles/showarticle.cfm?ArticleID=38dbdcdc-94df-4bd5-9570-d8a8a5b22eaa

TISBO circuits and wholesale conveyance and interconnection services in the NCC. Whilst NCC services involve the use of additional switching elements in the network, we have no reason to believe that our efficiency assumptions for NCC and TISBO services should be different, especially as the basis for modelling BT's efficiency was benchmark studies of the whole of BT's network using the same approach for conveyance and switching elements.

4.48 We have rejected the idea of "catch-down". As explained in the LLCC statement[20] (para 4.226), we have used the tenth percentile of US Local Exchange Carriers (LECs), ranked by efficiency, as the benchmark efficient firm. We used the top decile of LECs as a benchmark in previous controls in order to allow for the possibility of data error, rather than to generate a precise estimate of the efficient level of costs. The decile rather than, for example, the most efficient firm was used so that we could be certain that we were comparing against an achievable level of efficiency. Therefore, we have not allowed for a catch down in our final efficiency assumption.

4.49 The LLCC Statement explains how we have set a 2.5% efficiency target in our charge controls for TISBO services which comprises frontier shift only because BT was found to be at the efficiency frontier when benchmarked against comparator network operators. The underlying analysis set out in Annex 7 to the LLCC Statement[21] explains how this was calculated and in particular Ofcom's view of the further evidence and analysis submitted by Deloitte on behalf of BT.

4.50 Given the common use of TDM infrastructure by TISBO and NCC services and the findings on efficiency reported in the LLCC statement for TISBO services, we have concluded that the efficiency target for BT will be 2.5% per year for the NCC. This is towards the upper end of the range on which we consulted (1 – 3%).

4.51 We note that moving from the 2% base case in our consultation document to 2.5% is also consistent with the information submitted to us by respondents to the consultation to suggest that further efficiency improvements than those consulted on were possible for BT.

4.52 With regard to the use of data on European operators, we note that the Deloitte study commissioned by BT uses data on European incumbents as well as US LECs. As explained in the LLCC statement, we think that the results of Deloitte study understate the historical efficiency trends over time.[22] Nevertheless, the Deloitte study has been considered within our overall estimation of efficiency, so the evidence on the productivity of European operators has featured in our overall reasoning.

4.53 We have rejected the use of NGN efficiency benchmarks. While we believe that once out of the migration and parallel running stage, a steady state 21CN should yield productivity gains over the PSTN, such an approach would not be consistent with our cost modelling which seeks to set efficient price signals independently of the precise technology used, in particular abstracting from how BT might manage migration and parallel running and how this would impact on unit costs during this charge control period. Moreover, because we are not aware of a nation-wide fixed network operator having fully migrated to a NGN platform (e.g. in other countries) it is not possible for us to provide a robust quantification of the potential steady state efficiency gains, even if this were consistent with our cost modelling approach.

[20] http://www.ofcom.org.uk/consult/condocs/llcc/llccstatement/
[21] http://www.ofcom.org.uk/consult/condocs/llcc/llccstatement/llccannex.pdf
[22] Ibid, paragraph A 7.101 et seq.

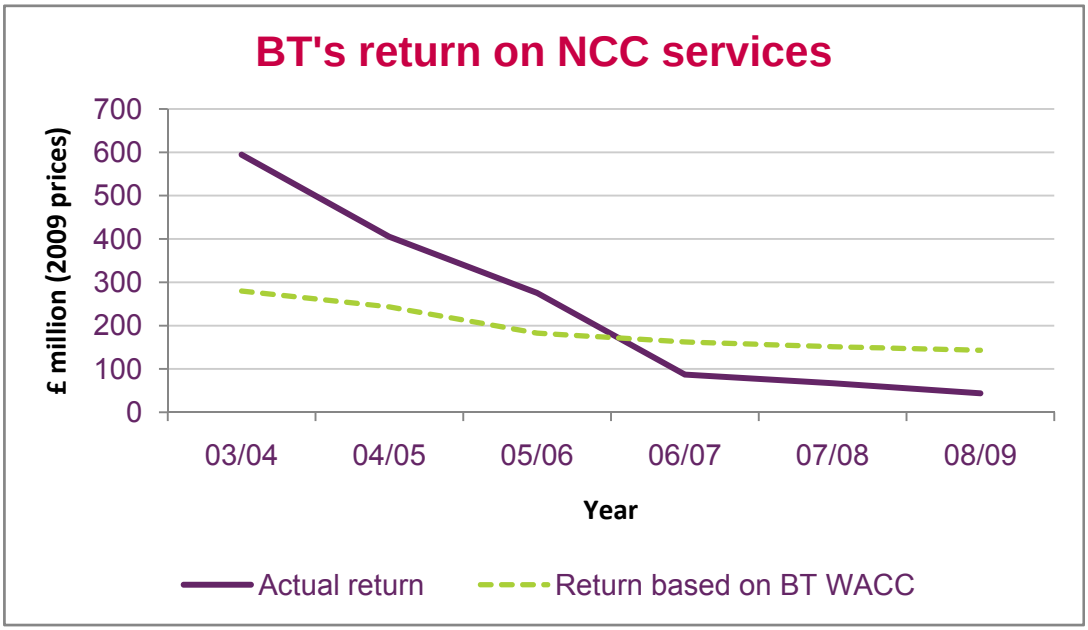
4.54 In conclusion, having analysed evidence submitted in responses to consultation and the relevant conclusions on TISBO efficiency from the empirical studies and reasoning contained in the LLCC statement, we consider that an efficiency target of 2.5% per annum is appropriate for the NCC. This combines our conclusions on catch-up (0%) and frontier shift adjustments (2.5% per annum).

BT's profitability

4.55 Some stakeholders have suggested that BT will be able to generate excessive returns through its extension of PSTN use and deferral of 21CN development.

4.56 However, the current trend and level of BT's profitability for NCC services before the new NCC shows returns in 06/07, 07/08 and 08/09 which were not sufficient to cover BT's weighted average cost of capital (WACC) on a FAC basis, as demonstrated in Figure 4.2 below. Whilst BT's reported profitability is affected by 21CN costs which have been excluded from our hypothetical ongoing cost modelling, the returns comparison below is consistent with our finding that BT's returns on NCC services have fallen below the level of modelled fully allocated costs (FAC) at the start of the new NCC.

Figure 4.2 – BT's return on NCC services in 2009 prices



4.57 As explained above in the discussion of BT's plans for its voice services, it is not currently possible to take a robust view on the returns BT will make over the period of the new NCC. However, given that BT's starting position is one where reported and modelled returns are below its WACC on a FAC basis (and where the NCC has been set to achieve returns at this level by the end of the control period), we do not consider that the new NCCs will allow BT to make excessive returns (unless it can significantly out-perform the control for example by beating the efficiency target we have set).

4.58 The hypothetical ongoing model is designed to enable alignment of charges to modelled efficient costs by the end of the control period and in our view remains the most reliable cost modelling option to create efficient investment incentives and protect downstream markets and consumers from excessive levels of charges.

Cost base

Our proposal

4.59 In the March consultation we proposed that the technology neutral model used to set charge controls for the 2009-2013 period should be based on CCA FAC costs adapted from BT's RFS. The paragraphs below summarise why we decided to use CCA FAC instead of LRIC+EPMU:

- We believe that in this case CCA FAC is more transparent and reliable than LRIC+EPMU. CCA FAC data is based on BT's audited RFS whereas BT's LRIC model is derived from top-down data and and is not audited.
- CCA FAC was used to set the 2005 NCCs. Thus, using CCA FAC for the 2009 NCCs ensures continuity of the costing methodology.
- Finally, CCA FAC is also consistent with other more recent charge controls determined by us for other areas of BT's business such as leased lines and Openreach. Consistency across the regulation of different services provided by BT ensures that common costs are treated in a consistent way.

Consultation responses

4.60 A number of respondents suggested that we should be using a LRIC model that uses regularly audited LRIC+EPMU figures. One respondent, in particular, felt that the use of LRIC is important in order to limit BT's ability to distort prices by allocating common costs disproportionately to regulated services. Another respondent argued that the use of FAC CCA instead of LRIC+ generates greater changes in unit costs when volumes fall and therefore LRIC should be used. Another respondent favoured the use of long run marginal cost as the relevant cost base.

4.61 Some respondents reasoned that we should use pure LRIC (i.e. no mark-up for common costs) in order to comply with the European Commission's Recommendation on call termination regulation.

Our analysis and conclusions

4.62 In principle LRIC based charges would provide appropriate signals to competitors about whether they should buy the service from the incumbent or build their own infrastructure to provide the service themselves. Competitors that are more efficient - i.e. can provide the service at a lower cost - will build their own infrastructure while others will buy the service from the incumbent.

4.63 Whether unit costs on a LRIC basis may be more stable than on a FAC basis critically depends on the cost-volume elasticity (CVE) applied. If the CVE is less than 1, there is an element of fixed costs within the cost function, meaning that while costs will decline with volume declines, the change in costs is less than proportional so that overall unit costs would rise. Hence even in a LRIC model, with CVEs less than 1, falling volumes mean that unit costs would rise.[23]

4.64 Moreover, BT's latest RFS show that for the key services of origination and termination, the unaudited LRIC floor (in unit i.e. ppm terms) increased by more than

[23] Note that if the same CVE and AVE is applied to an FAC model as would be applied to a LRIC model, the change in unit costs from a change in volumes would be the same under either model.

the reported unit FAC from 2007/8 to 2008/9. While we have some reservations about the robustness of the unaudited LRIC numbers, this illustrates that it is not necessarily the case that a LRIC model will produce smaller increases in unit costs than a FAC model as volumes decrease.

4.65 Finally, in comparing LRIC+EPMU (as opposed to just LRIC) to a FAC model, the way that common costs are allocated will critically affect the resulting unit cost comparison between the two approaches. For example, in a LRIC+EPMU model even if the LRIC of a given service were unchanged, the LRIC+EPMU based unit cost could nevertheless go up. This would be the case if total network volumes fell and hence the sum of network incremental costs also fell, because the unchanged common costs (which are by definition fixed) would have to be recovered from all services by means of a greater equal proportionate mark-up over the LRIC of each service.

4.66 Compatibility with the Commission's Recommendation is explained in the section on duration below.

4.67 In conclusion, we believe that the use of CCA FAC remains the most appropriate approach for this NCC. This is primarily for the reasons explained in the March consultation and summarised in paragraph 4.59 above, i.e:

- the greater transparency and reliability of CCA FAC data than available LRIC data;
- continuity with past NCCs; and
- consistency with other charge controls.

Confirmation of basket structure

Our proposal

4.68 In the consultation document we proposed that the NCCs will be set for four distinct charge control baskets. These baskets were:

- call origination;
- call termination;
- interconnection circuits; and
- PPP.

Consultation responses

4.69 One respondent said that BT had the ability to raise rental charges unfairly in the Interconnection Specific Basket (ISB). Another respondent urged us to be vigilant and monitor constraints on BT's ability to raise rental charges while lowering connection charges in the ISB basket.

Our analysis and conclusions

4.70 We have considered whether there is a case for applying sub-caps on rentals of interconnect circuits. The fact that CPs have largely built their interconnecting PSTN

infrastructure might, in theory, allow BT to raise the price of rentals while at the same time lowering connection charges. However, current connection revenues are a small proportion of total ISB revenues: accounting for around 6% of total ISB revenues in 2008/09 and around 9% of external revenue[24]. As basket weights are based on prior financial year revenues, the small proportion of connection revenues compared to rental revenues (and hence high weight on rentals) limits BT's ability to raise rental charges within the ISB basket. Therefore, we think that caps on individual charges would require a level of regulatory intervention that would not be proportionate to the perceived benefits of such individual sub-caps.

4.71 We expect the weight of rental charges within the ISB basket to increase further in the future as the number of new connections declines, thus further limiting BT's ability to raise rental charges significantly going forward. Therefore, we have decided not to apply sub-caps on rental charges within the ISB charge control.

Time of day charges – the network tariff gradient

4.72 Ofcom did not explicitly consult on operation of the network tariff gradient. However, during consultation, some stakeholders mentioned the operation of the time of day gradient in relation to NCC services. The time of day gradient was originally a retail pricing concept, designed to manage traffic loading on the network. BT has managed the network tariff gradient (applicable to wholesale conveyance) with reference to the retail tariff gradient, and operated a system to ensure that the retail and network gradients did not diverge materially. BT has published information on this framework in its Carrier Price List.[25]

4.73 Since an increasing percentage of calls are now sold in packages of inclusive bundled minutes at the retail level, the retail tariff gradient is becoming a less useful tool for setting the network tariff gradient. As a result BT has informed Ofcom that it is considering whether it is appropriate to review operation of the network tariff gradient. Ofcom has indicated to BT that any changes to the current system should only be made following consultation with Ofcom and industry.

4.74 Also in relation to the network tariff gradient, some stakeholders have noted the practice by mobile network operators of regular and significant changes in time of day charges for call termination, and expressed concern that BT might engage in similar behaviour for fixed voice wholesale conveyance services. Ofcom is considering this issue as it applies to mobile termination in its Wholesale Mobile Voice Termination Market Review.[26] In relation to BT's network tariff gradient, we note that BT's wholesale conveyance charges have normally only been subject to single annual changes in the past, with no frequent alterations to the network tariff gradient.

4.75 Ofcom will consider any proposals from BT to change the current system on their merits. In the meantime, we note that operation of the network tariff gradient has not created significant problems to date and, in particular, there have been no frequent or disruptive changes. We would expect the same of any changes to operation of the network tariff gradient. In this regard, we believe it is essential that BT consults

[24] Source: BT's RFS Section 8.6
http://www.btplc.com/Thegroup/RegulatoryandPublicaffairs/Financialstatements/index.htm
[25]
http://www.btwholesale.com/pages/static/service_and_support/service_support_hub/online_pricing_hub/cpl_hub/cpl_pricing_hub.html
[26] http://www.ofcom.org.uk/consult/condocs/mobilecallterm/

industry on any proposed changes. We also note that the system for wholesale fixed narrowband charge changes is likely to be more stable than that for mobile call termination since 90 days' notice is required; whereas in mobile call termination the notice period is 28 days.

4.76 If new arrangements for the tariff gradient were to result in tariff structures which would disadvantage any group of customers or distort competition or the operation of the NCCs, Ofcom would expect to take action to address such problems.

Treatment of 21CN services

4.77 Respondents to the consultation agreed with Ofcom's proposals on the treatment of 21CN services.

4.78 We have not set charge controls for future 21CN voice services. Based on the information we have on BT's planned 21CN services we cannot, at present, impose charge controls on future 21CN services. We do not have a detailed enough description of the services that would allow us to determine which services fall in SMP markets and what regulated charges should be. Moreover, our understanding is that BT's plans to migrate voice services to the 21CN platform will be at a slower pace than previously envisaged,[27] so the extent of migration within the four year duration of the new NCC is uncertain and may not be significant.

4.79 However, the regulatory treatment of these services will be considered when the details of such services become clearer. As explained in the WNMR Statement, appropriate regulatory remedies will apply to wholesale 21CN services in SMP markets.

Use of prior year revenue weights

4.80 Respondents to the March consultation agreed with Ofcom's proposals on the continued use of prior year revenue weights.

4.81 Whilst the use of prior year weights has the disadvantage that it does not use contemporaneous data, an alternative based on current year estimates would require subsequent reconciliation to outturn revenues and hence likely retrospective adjustment. We believe that this complexity would create undue uncertainty for BT and CPs. By contrast, in their current form – which we will maintain – the NCC formulae allow BT to accurately specify charge changes which will be compliant with the caps which will apply for the relevant charge control year. Therefore, we will continue to use prior year revenue weights.

Provision for Carry-Over

Our proposal

4.82 Another feature of previous and existing charge controls has been the ability of BT to use the 'credit' created by setting charges below NCC requirements within a given year towards NCC compliance in the following year. Given the mechanics of the charge control formula, this carry-over approach avoids penalising BT for bringing forward a charge reduction (in the case of RPI-X controls) or increasing charges less

[27] BT published Bulletins in April and July on its secure Consult21 website which is available to other CPs on registration http://www.btplc.com/21CN/Theroadto21CN/Consult21/Consult21.htm

than the cap (in the case of RPI+X controls). [28] For this reason, for the new NCC, we proposed to retain the ability for BT to carry-over the credit from charge changes into subsequent NCC years.

Consultation responses

4.83 One respondent argued that carry over should not be allowed at all, or if it is allowed it should be limited to a low percentage of the absolute charge. Another respondent argued that as carry-over is not allowed in mobile termination regulation it should not be allowed in fixed regulation either.

Our analysis and conclusions

4.84 Ofcom believes that symmetrical carry-over provisions remain appropriate in the NCC. In principle, BT's ability to make charge changes early or delay them should not be constrained as long as they comply with the cap overall. It should be noted that under the carry-over arrangements the path of charges will never be higher than if the limit of the controlling percentage were met each and every year of the control period. However, if carry over were not explicitly allowed for, BT would end up with a tighter cap the following year whenever its percentage change in charges in the prior year was less than the controlling percentage for that prior year.

4.85 By contrast, the mobile termination charge controls[29] are set on the basis of explicit pence per minute caps, rather than as limits on percentage changes in charges. The mobile termination charge controls determine the limit of charges – known as the target average charge (TAC) – for the following year by applying the controlling percentage to the known TAC for the preceding year. Because the controlling percentage is not applied to the previously prevailing charge set by the operator (known as the average interconnection charge (AIC) in the mobile termination charge controls), a prior year AIC set below the prior year TAC does not impose a tighter constraint in the following year than that intended by the original glide path. Therefore, a provision for carry over is not necessary to guard against this risk in the mobile termination charge controls.

4.86 Notwithstanding this difference in the mechanics of the NCC and the mobile termination charge controls, there is nevertheless a provision in the mobile termination charge controls (MA4.7) which allows a difference between the AIC and the TAC to be made up if Ofcom gives its prior written consent.

4.87 We have concluded that the new NCC will include the ability for BT to carry-over any credit from charge changes into subsequent NCC years.

[28] The charge control formula works by limiting the percentage change in BT's prevailing charges to the controlling percentage (i.e. RPI+/-X). In the case of positive Xs if BT increased charges less than the controlling percentage in a given year, using the resulting charge to calculate the percentage change in charges the following year would result in a tighter cap on BT than if it had increased charges up to the limit determined by the controlling percentage in the first year. Without a carry-over provision this would result in a glide path which fell short of the efficient unit cost target at the end of the control period.

[29] See Annex 20 of the March 2007 mobile call termination statement at http://www.ofcom.org.uk/consult/condocs/mobile_call_term/statement/statement.pdf

Duration of the NCC

Our proposal

4.88 In the March consultation we explained our proposals for a four year control. We discussed the dynamic efficiency benefits of a four year period which have proved to be effective in previous NCCs and retail price controls. We also considered the option of a shorter 18 month control which would have weaker dynamic efficiency benefits but would potentially open up options for synchronisation of regulatory controls on fixed and mobile termination rates, and would allow for further review before the anticipated transition deadline in the European Commission's Recommendation on the regulatory treatment of fixed and mobile termination in the EU (which was then in draft but has now formally been adopted – see below). We also discussed the possibility that an 18 month control would provide the opportunity of better visibility and understanding of NGN costs for voice services. Taking account of these factors we explained why, on the weight of evidence, we favoured a 4 year control.

Consultation responses and relevant developments subsequent to consultation

4.89 A number of stakeholders commented on duration in their responses to the consultation document. Also, two developments since publication of the consultation document are relevant to the question of duration, and Ofcom has also considered them in reaching its conclusions. The two developments are:

- BT's announcements concerning its plans for voice services and the continuation of the public switched telephony network (PSTN) during the life of the new NCC.[30]

- The formal adoption in May 2009 by the European Commission of the Recommendation on the regulatory treatment of fixed and mobile termination rates in the EU.[31] The Commission's Recommendation includes a costing methodology based on a pure LRIC approach to NGNs and sets a period for transition to adoption of the Recommendation by NRAs of 31 December 2012.

4.90 Respondents to the consultation commented on the implication of both of these developments in their responses.

Our analysis and conclusions

BT's plans for its voice services

4.91 We have concluded that BT's announcement does not materially affect our earlier proposal for NCC duration. The hypothetical ongoing approach to cost modelling employed by Ofcom in the NCC review was specifically designed to be flexible to give efficient price signals irrespective of precise technology use and deployment outcomes.

4.92 As noted above our understanding is that BT's plans to migrate voice services to the 21CN platform will be at a slower pace than previously envisaged, so the extent of migration within the four year duration of the new NCC is uncertain and may not be

[30] BT published Bulletins in April and July on its secure Consult21 website which is available to other CPs on registration http://www.btplc.com/21CN/Theroadto21CN/Consult21/Consult21.htm
[31] http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:124:0067:0074:EN:PDF

significant. Since the hypothetical ongoing model includes adjustments to exclude 21CN costs and is based on an ongoing network using PSTN components, we have concluded that its use to set a four year NCC remains valid (and, if anything, more appropriate) following BT's announcement.

4.93 We have made some adjustments to the model to reflect the extended use by BT of PSTN assets. This is explained in this Section at paragraphs 4.22 to 4.53 and in Annex 2.

The EC Recommendation

4.94 Some respondents felt that Ofcom should shorten the duration of the NCCs to enable consistency with the EC Recommendation by 31 December 2012 – the end point for transition to the recommended methodology adopted by the Commission. In addition the Commission has invited Ofcom to reconsider its approach to the charge control on call termination in light of its published recommendation. Ofcom has considered its proposals in light of the Recommendation.

4.95 It is important to note that we fully considered the draft Recommendation, as it then was, in our consultation document published on 19 March 2009. A key piece of missing information was the length of any transitional period, with dates mooted between 2011 and 2013 inclusive, during various iterations of the draft. Given this uncertainty, whilst we were able to consider the overall direction of the Recommendation it was not open to us to consult on a charge period specifically designed to run until the end of the transitional period.

4.96 The Recommendation was issued by the Commission on 7 May 2009. As a National Regulatory Authority (NRA) Ofcom is required by Article 19(1) of the Framework Directive to take utmost account of this Recommendation when considering relevant regulation. "Utmost account" is not defined in the Directives, nor is it defined in the Act. Similar phrases such as "having regard to" have been considered and interpreted as meaning that the recommendation or guidance concerned is not required to be followed, nor is there a presumption that it should be followed, but where an authority seeks to depart from the recommendation or guidance it is required to give its reason for doing so and those reasons must be sufficient to show that proper consideration has been given to the recommendation or guidance and that the reasons for not following it have demonstrated that the decision reached was sound.

4.97 This is the approach that has been taken here and we set out our reasoning below as to why we consider a different approach to that set out in the Recommendation to be appropriate in all the circumstances.

4.98 The Recommendation recognises that, on publication, its objectives may not be immediately achievable, and indeed, for the reasons explained above the UK considers that it is not currently in a position to adopt a NGN based model, nor pure LRIC.

4.99 Ofcom has concluded that we are not, in light of specific national circumstances, in a position to set a control based upon NGN infrastructure and pure LRIC modelling within the timeframe of this NCC review. This is because of the very limited information currently available on NGN costs and our conclusion that the NCC should be based on CCA FAC data for the reasons discussed and explained in paragraphs 4.59 – 4.67. Therefore the primary question we have considered is whether it would be appropriate to alter the duration of the proposed control period.

4.100 The Commission recognises that a transitional period is required for current controls to come to an end. Should our control last for a period of three years and three months or less, then it would not exceed the transitional period allowed for by the Recommendation.

4.101 We have therefore carefully reviewed whether it would be appropriate to reduce the control period from the proposed four year duration. In this review, we examined a number of alternative options for duration. We considered and rejected an 18 month control for the reasons explained in the March consultation and, in particular, that it would require a new review to commence very shortly after the start of the new NCC in October 2011 at a time when it is unclear that significant new data on NGN LRIC costs would be available. Noting that the transitional period has been set to run until 31 December 2012, we also considered the merits of imposing a three year control period, in other words reducing the proposed four year period by 12 months. This would allow a reassessment of the charge control applied to fixed termination services to be conducted within the transitional period with full sight of the Commission's recommendation. However, we are concerned that any shortening of the NCCs would weaken the following benefits associated with a four year period.

- We wish to preserve the strong dynamic efficiency incentives of a four year NCC explained in the consultation document. A shorter control would dilute these incentives.

- The four year control period applies across all the NCC services (i.e. call termination, call origination, interconnection circuits and PPP), and therefore allows a consistent approach to be taken in relation to the cost methodology and how BT should be permitted to recover the costs of an efficient operator. We do not wish to shorten the controls for other NCC services to enable a review driven solely by consideration of possible changes to the framework for one service (call termination).

We also considered de-linking the controls to allow a shorter duration for call termination only. This would create distortions in the allocation of common costs between call termination and other NCC services and so we have concluded that it would be undesirable.

4.102 In addition to these points, Ofcom has considered the following factors in its review of NCC duration.

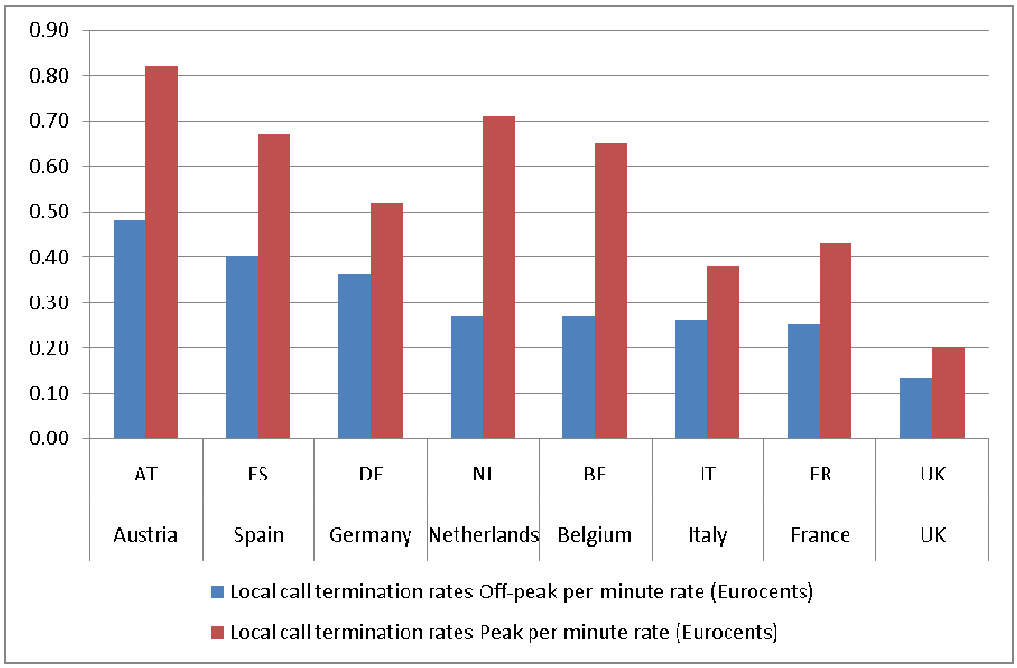
- A reduction in duration would require significant adjustments to the values of X in the NCC as there is a direct link between the duration of the control and the speed of charge changes. Xs for the new NCC will be positive (i.e. they will allow increases to charges) and so a shorter NCC would result in sharper rises in the charges for NCC services.

- A change to the duration of the NCC would constitute a material change since consultation. This would require us to reconsult on the issue and inevitably delay the introduction of the NCCs beyond 1 October 2009. This, in turn, would require an interim bridging measure to be put into place to ensure that the NCC services remained appropriately regulated during this period.

- Whilst Ofcom's modelling methodology for the new NCCs is not fully consistent with the Commission Recommendation, we believe that the regulatory outcome is consistent. BT's termination rates are currently the lowest on any fixed network in Europe and the increases to charges allowed under the new NCC seek only to

reconcile them to the efficient level of cost modelled by Ofcom in the hypothetical ongoing model. A comparison of BT's termination rates with those of other European providers is shown in Figure 4.3 below. Even if the UK fixed termination rates were increased by the maximum allowed under the new NCC (i.e. 3.75% per annum in real terms) neither the peak nor off-peak rates shown below would rise above those of the next lowest fixed termination rates at their current levels.

Figure 4.3 Comparison of European fixed termination rates (source: Cullen International)



4.103 We have paid particular attention to our duties under section 4 of the Act which, in turn reflect the objectives set down by Article 8 of the Framework directive. The Recommendation is issued under Article 19(1) of that Directive which states that Recommendations made under that Article will be made in order to further the achievement of the objectives set out in Article 8. We consider that, for the reasons set out above, a four year control is the best for creating dynamic efficiency incentives that will, in turn, promote competition. In particular the four year model has been designed in order to encourage efficient investment, by both BT (to whom the control applied) and other CPs who benefit from the certainty of the control. We therefore consider that a four year control achieves the policy objectives in Article 8 and therefore consistent with our duties under the Act. In this regard, in addition to taking utmost account of the Recommendation, we have also taken utmost account of those objectives as required under Article 7(1) of the Framework Directive, specifically as to their application to specific national circumstances.

4.104 Balancing all relevant factors we have concluded that the appropriate duration for the NCCs is 4 years.

4.105 We will continue to engage positively with stakeholders on call termination issues – both nationally and at the European level – through the wholesale mobile voice call

termination market review currently underway[32] and in subsequent relevant regulatory proceedings.

Conclusions on NCC duration

4.106 On the basis of these considerations, we confirm that the next NCC will have a duration of four years, running from 1 October 2009 to 30 September 2013.

Charges will follow a glide path without an initial one-off adjustment

Our proposals

4.107 In the March consultation we considered two options. In the first, BT's charges would follow a glide path between current charges and future costs (Approach A). In the second option, an initial one-off adjustment would align BT's charges and costs at the beginning of the charge control period (Approach B). We considered each of these options. On balance, we believe that the better approach for the new NCC is to align charges to FAC at the end of the NCC period using a glide path without an initial one-off adjustment. The primary reasons for this conclusion were:

- We believe that for the NCCs, the incentives for dynamic efficiency of price caps are stronger with glide paths than one-off adjustments. This is because out-performance of the control (i.e. the return on the investment in the cost saving activities) is retained for longer and not truncated at the end of each charge control period. Because Approach A would maintain our glide path methodology adopted in previous NCCs, it will in our view be better suited to promoting competition and our duties under section 3 including section 3(4)(b) promoting competition; (d) encouraging investment and innovation; and Community obligations under sections 4(3)(a); 4(7) and 4(8).

- In previous price caps and NCCs Ofcom has favoured glide paths to align charges to the target efficient unit costs at the end of the control period and we do not believe it is appropriate to create an asymmetric framework for regulation by applying one-off adjustments in this case. This would not be consistent treatment of charge controls. We are, under section 3(3), required to have regard to the principle of consistency in performing our duties.

- Although the adoption of Approach B would not necessarily create an asymmetric framework for regulation if Ofcom changed its approach to setting charges thereafter, we consider that the arguments in favour of Approach B are not sufficient to justify a change of approach and, noting our obligation to regulate in a consistent manner, we consider it appropriate to continue to set charges using glide paths.

4.108 For all of the reasons above we considered in the consultation document that the setting of charges to follow a glide path (Approach A) was the most appropriate way to set the NCCs. Specifically, we set out that the approach both satisfies the legal requirements under section 88, and is the more consistent approach when considering our duties under sections 3 and 4 of the Act.

4.109 There is one exception when we would consider a starting adjustment to be necessary. We believe that the minimum level of cost recovery for NCC services is long run incremental costs (LRIC), proxied by the distributed LRIC (DLRIC) figures

[32] http://www.ofcom.org.uk/consult/condocs/mobilecallterm/

published by BT in its regulatory Financial Statements. Whilst the DLRIC floors are not subject to audit scrutiny, they are the best available proxy for LRIC for NCC services and we therefore believe that charges for all NCC services should be no lower than the DLRIC floors normalised for one-off or exceptional events such as current cost valuation effects and the inclusion of costs not relevant to a hypothetical ongoing network approach to costing (such as 21CN). Therefore, if charges for NCC services were below their respective DLRIC floors we would adjust starting charges to cover the DLRIC floors.

4.110 We assessed starting charges against their model consistent DLRIC floors. NCC services cover DLRIC, and as such they ensure that the controlled services will be incrementally profitable. Therefore, we concluded that there is no need to adjust starting charges to cover DLRIC floors. A comparison of starting charges against model consistent DLRIC floors is shown in the table below.[33]

Table 4.1: Starting charges against DLRIC

	Starting Charge 09/10	DLRIC Floor 09/10
Termination (ppm)	0.160	0.129
Origination (ppm)	0.178	0.141
PPP (ppm)	0.010	0.008
ISB[34]	58.44	50.87

Consultation responses

4.111 Most respondents agreed that a glide path is preferable to an initial one-off adjustment. BT suggested that we make a one-off adjustment that covers the shortfall caused by the difference between forecast and outturn volumes for the current NCC.

Our analysis and conclusions

4.112 For the reasons stated above, we believe that it is still more appropriate to use glide paths. However, we have considered whether it would be possible to make adjustments to starting charges to reflect any *exogenous* volume effects – i.e. those volume shortfalls which were outside of BT's control. We have concluded that in practice it is impossible to separate exogenous from endogenous volume reductions which exceeded those previously forecast. Also, in previous NCCs, BT has retained the benefit of both exogenous and endogenous volume increases. Therefore the principle of symmetry suggests that we should not adjust for exogenous volume effects.

4.113 We confirm that NCCs will be set along a glide path without an initial one-off adjustment.

[33] Given the limitation of our data, we are unable to calculate the DLRIC for BT's services directly, and moreover, we need the DLRIC for 2009/10 which is not published. The modelled DLRIC is calculated by using the average ratio of LRIC Floor to FAC reported in BT's RFS over the last 6 years. This figure is then multiplied by the modelled FAC in 2009 to give the 2009 DLRIC value.
[34] The ISB value is a weighted charge across all ISB services. As such it should only be considered an indicative figure and does not relate to any particular ISB service.

RPI and the treatment of deflation

Our proposal

4.114 In the March consultation we proposed the use of RPI as the appropriate index for the charge control. Most respondents agreed with us.

Consultation responses

4.115 Two respondents suggested that we consider the impact of possible deflation. In particular, BT pointed to a number of its costs that it argued would not fall as quickly as suggested by the decline in RPI. BT argued that the downward "stickiness" of its costs suggested that, if the value of RPI were negative, it would be more difficult to meet any charge control and at the same time maintain a reasonable rate of return. It therefore argued that the value used in the charge control should default to zero in the event of a negative change in RPI.

4.116 Another respondent suggested RPI excluding mortgage interest should be used in order to avoid irrelevant distortions.

Our analysis and conclusions

4.117 Having assessed BT's arguments, we do not think that a proportionate response would be to set the value of RPI to zero where deflation occurs. In particular, we think that:

- Most external forecasters attach only low probability to material and sustained deflation over the charge control period[35].
- As with any firm, BT has some scope to reduce its costs in response to deflation and it should be given incentives to pass these reductions through to customers. Indeed, it is often argued that wages are less flexible downwards than upwards. However, this does not mean that wages cannot be reduced, only that there may be less scope for reductions than for increases. Moreover, we consider that BT should be able to reduce costs sufficiently when faced with modest rates of deflation.

4.118 We note that in the recent Openreach Financial Framework Statement (OFF)[36] (paragraph 1.20) we included an adjustment to the value of X used in that control to reflect possible bias from the use of negative RPI figures. However, we believe that these adjustments were appropriate in the context of the OFF Statement given the short duration of the charge control. As we are setting the next NCCs for four years where it is only RPI for the controlling percentage in the first year that is anticipated to be negative we believe that to make such an adjustment here would not be appropriate.

4.119 On the idea of excluding mortgage interest, we consider that an advantage of RPI is its familiarity to stakeholders, which means that its use as a charge control index enhances the transparency of the system. Moreover, RPI has long been used as the

[35] The Treasury collates medium term annual inflation forecasts made by City and non-City forecasters. The average of the forecasts published in August 2009 is as follows: -1.1% (Q4 2009), 1.8% (Q4 2010), 2.2% (Q4 2011), 2.8% (Q4 2012) and 2.7% (Q4 2011). Source: page 20 of http://www.hm-treasury.gov.uk/d/200908forcomp.pdf.

[36] http://www.ofcom.org.uk/consult/condocs/openreach financial framework

benchmark index in telecoms and other sectors subject to charge or price controls. Indeed, the Competition Commission ("CC") in its assessment of the economic regulation of Gatwick and Heathrow airports concluded that:

> "…there is no regulatory precedent in the UK for changing from the RPI index, though most sector regulators have examined the issue at some point. Most sector regulators have concluded that the value of continuing to base controls on RPI is, first, that precedent favours RPI, and secondly that significant cost items of regulated companies, such as index linked bonds which are used to calculate the cost of capital and wage settlements, are generally linked to RPI […]. We therefore see no reason to change the current approach of relating increases in charges to changes in the RPI."[37]

4.120 Therefore, we confirm that our glide path will take the form of RPI+X.

Pension deficit

Our proposal

4.121 In the consultation document we proposed that we would not make any adjustment to the NCCs for BT's pension deficit.

Consultation responses

4.122 Two respondents raised the question of the treatment of BT's pension fund deficit in the NCC. This issue has been raised with Ofcom across a number of recent charge control reviews.

Our analysis and conclusions

4.123 Consistent with the LLCC and the OFF, our cost calculations exclude any contribution that BT Wholesale might make in funding the shortfall in the BT Group pension scheme. While this approach is consistent with our historic treatment of pension deficits and surpluses, we consider that this issue is of increasing importance to the companies we regulate. Accordingly, we are currently undertaking a separate review of our treatment of pension costs which will inform our future approach.

Confirmation of Xs

4.124 Using outputs of the hypothetical ongoing cost model with the approach explained in this section, the new NCCs to apply from 1 October 2009 will be as follows.

[37] http://www.competition-commission.org.uk/rep_pub/reports/2007/fulltext/532.pdf (paragraphs 3.21 to 3.22)

Table 4.2: NCCs -to apply from 1 October 2009

Service/technical area/ component	NCC 2009-2013	Proposed NCC ranges in the March 2009 Consultation	Current NCC 2005-2009
Call termination	RPI+3.75%	RPI+3.25% to RPI+10.5%	RPI-5%
Call origination	RPI+2.75%	RPI+2.5% to RPI+9.5%	RPI-3.75%
Interconnection circuits (ISB)	RPI+3.75%	RPI+1.5% to RPI+6.5%	RPI-5.25%
PPP	RPI+1.50%	RPI+0% to RPI+6.75%	RPI+0.75%

Conclusions

4.125 For the reasons set out in our March consultation, we consider that the Charge Controls as they were proposed with the modifications set out in this statement and having carefully considered the consultation responses are appropriate remedies to address the competition problems identified in our market analyses. We therefore refer to our March consultation for the full reasoning as to the application of the legal tests under sections 47 and 88 of the Act.

Annex 1

Legal Instruments

NOTIFICATION UNDER SECTION 48(1) OF THE COMMUNICATIONS ACT 2003

The setting of SMP services conditions to be imposed upon BT as a result of the market power determinations made under the Review of the fixed narrowband services wholesale markets published on 15 September 2009

Background

1. On 28 November 2003, the Director General of Telecommunications ("the Director") published a *Review of the fixed narrowband line, call origination, conveyance and transit markets*[38]; and a *Review of fixed geographic call termination markets*[39].

2. On 29 December 2003, Ofcom took over the functions and responsibilities under the Communications Act 2003 relating to the EC Communications directives from the Director.

4. On 30 July 2004, Ofcom published a *Review of BT's product management, policy and planning (PPP) charge*[40], setting a new SMP condition in relation to BT.

5. On 10 February 2005, Ofcom published *Modifications to BT's SMP services conditions AA4, BA4 and PA1*[41].

6. On 18 August 2005, Ofcom published a *Review of BT's Network Charge Controls*[42] which reviewed the markets for local-tandem conveyance / transit and inter-tandem conveyance / transit. The review found the market for inter-tandem conveyance / transit to be competitive; BT no longer held SMP in that market and SMP conditions relating to that market were revoked.

7. On 19 March 2009, Ofcom published a *Review of the fixed narrowband wholesale markets* ("the wholesale consultation") which included at Annex 7 a Notification containing proposals for identifying markets, making market power determinations and the setting of SMP services conditions. In particular, the Notification to the review identified, at paragraph 8, various markets, where it proposed that BT held SMP and a charge control was an appropriate remedy.

8. The wholesale consultation also proposed continued regulation, by way of charge control, of the Product Management, Policy and Planning ("PPP") charge, as an administrative charge related to SMP markets and interconnection circuits as a necessary technical area to an SMP market.

[38] http://www.ofcom.org.uk/consult/condocs/narrowband_mkt_rvw/nwe/
[39] http://www.ofcom.org.uk/consult/condocs/narrowband_mkt_rvw/Eureviewfinala1.pdf
[40] http://www.ofcom.org.uk/consult/condocs/rev_bt_pm/statement/statement.pdf)
[41] http://www.ofcom.org.uk/consult/condocs/dissmpbt/expl_sn/llusmp_explsn.pdf
[42] http://www.ofcom.org.uk/consult/condocs/review_bt_ncc/reviewbtncc.pdf

9. On 19 March 2009, Ofcom also published a *Review of BT's Network Charge Controls*[43] in which proposals were made for the imposition of SMP conditions AAA4(CO), BA4 and PA1 under the authority of the market analysis conducted in the wholesale review.

10. On 15 September 2009, Ofcom published its final statement, a *Review of the fixed narrowband wholesale markets*[44] ('the wholesale statement') in which, following a full consultation process, it concluded that BT held SMP in, amongst others, the following markets and associated areas:

a. wholesale call origination on a fixed narrowband network;
b. wholesale fixed geographic call termination on each individual network;
c. BT's PPP charge; and
d. interconnection circuits.

11. Ofcom also concluded that a charge control was an appropriate remedy for each of the above markets / areas set out in paragraph 10 above. In particular, it was identified that in the absence of a charge control there was a risk that BT may be able to price excessively. Whilst the appropriateness of a charge control was decided, no decision was taken as to how that charge control should be implemented; that decision was devolved to this review, in order to set SMP conditions that establish appropriate charge controls.

12. This Notification sets those SMP service conditions relating to charge controls in each of those four markets / areas.

Decisions

13. Ofcom hereby makes, in accordance with section 48(1) of the Act, the following decisions for the setting of SMP service conditions ("SMP conditions").

14. Ofcom has decided that SMP conditions implementing charge controls be imposed upon BT in the following markets and areas as identified by the wholesale statement:

(a) wholesale call origination on a fixed narrowband network;

(b) wholesale fixed geographic call termination on each individual network;

(c) PPP; and

(d) interconnection circuits

15. Ofcom has decided to set the following conditions:

(a) in relation to the services market identified in paragraph 10(a), SMP condition AAA4(CO), set out in Schedule 1 to this Notification;

(b) in relation to services market identified in paragraph 10(b), SMP service condition BA4 set out in Schedule 2 to this Notification;

(c) in relation to the areas identified in paragraphs 10(c) and 10(d), SMP service condition PA1 set out in Schedule 3 to this Notification.

[43] http://www.ofcom.org.uk/consult/condocs/review_bt_ncc/
[44] http://www.ofcom.org.uk/consult/condocs/review_wholesale/statement/

16. The effect of, and Ofcom's reasons for making the decisions to set the SMP conditions set out in Schedules 1, 2 and 3 to this Notification are contained in Section 4 of the explanatory statement accompanying this Notification.

Ofcom's duties and legal tests

17. In making the decisions set out in this Notification Ofcom considers that the SMP service conditions referred to in paragraph 15 of this Notification comply with the requirements of sections 45 to 47, 87 and 88 of the 2003 Act as appropriate and relevant to each of those SMP service conditions.

18. In making all of the decisions referred to in paragraphs 13 to 15 of this Notification, Ofcom has considered and acted in accordance with its general duties set out in section 3 of the Act and the six Community requirements in section 4 of the Act.

19. Copies of this Notification and the accompanying explanatory statement have been sent to the Secretary of State for Business Innovations and Skills in accordance with section 50(1)(a) of the Act, as well as the European Commission and to the regulatory authorities of every other member State in accordance with section 50(2) of the Act.

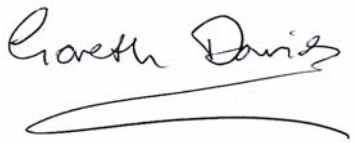
Interpretation

20. Save for the purposes of paragraph 10 of this Notification and except as otherwise defined in paragraph 21 of this Notification, words or expressions used shall have the same meaning as they have been ascribed in the Act.

21. In this Notification:

(a) "**the Act**" means the Communications Act 2003 (c. 21);

(b) **"BT"** means British Telecommunications plc, whose registered company number is 1800000, and any of its subsidiaries or holding companies, or any subsidiary of such holding companies, all as defined by section 736 of the Companies Act 1985 as amended by the Companies Act 1989.



Gareth Davies
Competition Policy Director

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

15 September 2009

SCHEDULE 1

Setting of SMP services conditions AAA4(CO) as a result of the market power determination made by Ofcom in the Notification to the Review of the fixed narrowband services wholesale markets dated 15 September 2009 in respect of the services market for call origination in the United Kingdom but excluding the Hull Area in which it has been determined that BT is a person having significant market power.

1. In Schedule 1 to Annex 7 of the Review of the fixed narrowband services wholesale markets, there shall be set the following SMP services condition AAA4(CO), inserting it after Condition AAA3.

"Condition AAA4(CO)

Charge control – Call Origination

AAA4(CO).1 Without prejudice to the generality of Condition AAA3, and subject to paragraphs AAA4(CO).2, AAA4(CO).4 and AAA4(CO).5, the Dominant Provider shall take all reasonable steps to secure that, at the end of each Relevant Year, the Percentage Change (determined in accordance with paragraphs AAA4(CO).3) in the aggregate of charges for Call Origination Services is not more than the Controlling Percentage (determined in accordance with paragraph AAA4(CO).6).

AAA4(CO).2 For the purpose of complying with paragraph AAA4(CO).1, the Dominant Provider shall take all reasonable steps to secure that the revenue it accrues as a result of all individual Charge Changes during any Relevant Year shall be no more than that which it would have accrued had all of those Charge Changes been made at 1 April in the Relevant Year in question. The Dominant Provider shall be deemed to have satisfied this obligation where, by example in the case of a single Charge Change in the Relevant Year in question, the following formula is satisfied:

$RC(1-D) \leq TRC$

where:

RC is the revenue change associated with the single Charge Change made in the Relevant Year in question, calculated by the relevant Percentage Change immediately following the Charge Change multiplied by the revenue accrued during the Relevant Financial Year;

TRC is the target revenue change required in the Relevant Year in question to achieve compliance with paragraph AAA4(CO).1, calculated by the Percentage Change required in the Relevant Year in question to achieve compliance with paragraph AAA4(CO).1 multiplied by the revenue accrued from the provision of the Call Origination Services during the Relevant Financial Year; and

D is the elapsed proportion of the Relevant Year in question, calculated as:

(i) for any Relevant Year other than the Leap Year the date on which the Charge Change takes effect, expressed as a numeric entity on a scale ranging from 1 October = -182 to 30 September = 182, divided by 183.

(ii) for the Leap Year, the date on which the Charge Control takes effect expressed as a numeric entity on a scale ranging from 1 October = -183 to 30 September = 182, divided by 183.

AAA4(CO).3 The Percentage Change shall be calculated for the purposes of complying with paragraph AAA4(CO).1 by employing the following formula:

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

where:

C_t is the Percentage Change in the aggregate of charges for the services in Call Origination Servicesat a particular time t during the Relevant Year;

n is the number of individual services that form part of (or are comprised in) the provision of Call Origination Services;

R_i is the sum of the revenue accrued during the Relevant Financial Year in respect of the individual service i that forms part of (or is comprised in) the provision of Call Origination Services where i is a unique number from 1 to n for each of the n individual services in the provision of Call Origination Services;

$p_{0,i}$ is the published charge made by the Dominant Provider for the individual service i that forms part of (or is comprised in) the provision of Call Origination Services immediately preceding the beginning of the Relevant Year; and

$p_{t,i}$ is the published charge made by the Dominant Provider for the individual service i that forms part of (or is comprised in) the provision of Call Origination Services at time t during the Relevant Year.

AAA4(CO).4 Where the Percentage Change in the Relevant Year in question is less than the Controlling Percentage (the "Excess") then the Controlling Percentage for the following Relevant Year shall be determined in accordance with paragraph AAA4(CO).6, but increased by the absolute value of the Excess.

AAA4(CO).5 Where the Percentage Change in the Relevant Year in question is more than the Controlling Percentage (the "Deficiency") then the Controlling Percentage for the following Relevant Year shall be determined in accordance with paragraph AAA4(CO).6, but decreased by the absolute value of the Deficiency.

AAA4(CO).6 Subject to paragraphs AAA4(CO).4 and AAA4(CO).5, the Controlling Percentage in relation to any Relevant Year in question is the amount of the change in the Retail Prices Index in the period of 12 months ending on 30th June immediately before the beginning of that Year expressed as a percentage (rounded to two decimal places) of that Index as at the beginning of that period increased by 2.75 percentage points.

AAA4(CO).7 Where:

(a) the Dominant Provider makes a material change (other than to a Charge) to any Charge Controlled Service for which a Charge is charged;

(b) The Dominant Provider makes a change to the date on which its financial year ends; or
(c) there is a material change in the basis of the Retail Prices Index,

paragraphs AAA4(CO).1 to AAA4(CO).6 shall have effect subject to such reasonable adjustment to take account of the change as Ofcom may direct to be appropriate in the circumstances. For the purposes of paragraph AAA4(CO).7, a material change to the Charge Controlled Service includes (but is not limited to) the introduction of a new product and/or service wholly or substantially in substitution for an existing Charge Controlled Service.

AAA4(CO).8 The Dominant Provider shall record, maintain and supply to Ofcom in writing, no later than three months after the end of each Relevant Year, the data necessary for Ofcom to monitor compliance of the Dominant Provider with the price control by performing the calculation of the Percentage Change. The data shall include:

(a) pursuant to Condition AAA4(CO), the calculated percentage change relating to Call Origination Services;
(b) pursuant to Condition AAA4(CO).2, calculation of the revenue accrued as a result of all relevant individual charge changes during any Relevant Year compared to the target revenue change;
(c) All relevant data the Dominant Provider used in the calculation of the percentage change C_t pursuant to Conditions AAA4(CO).3;
(d) All relevant revenues accrued during the Relevant Financial Year in respect of Call Origination Services;
(e) Published charges made by the Dominant Provider at time *t* during the Relevant Year excluding any discounts offered by the Dominant Provider;
(f) The relevant published charge at the start of the Relevant Year;
(g) Other data necessary for monitoring compliance with the charge control.

AA 4.9 If it appears to Ofcom that the Dominant Provider is likely to fail to secure that the Percentage Change does not exceed the Controlling Percentage for the last relevant year beginning on 1 October 2012 and ending on 30 September 2013, the Dominant Provider shall make such adjustment to any of its charges for the provision of Call Origination Services and by such day in that Relevant Year (or if appropriate in Ofcom's opinion, by such day that falls after the end of that Relevant Year) as Ofcom may direct for the purpose of avoiding such a failure.

AAA4(CO).10 Paragraphs AAA4(CO).1 to AAA4(CO).9 shall not apply to such extent as Ofcom may direct.

AAA4(CO).11 The Dominant Provider shall comply with any direction Ofcom may make from time to time under this Condition.

AAA4(CO).12 In this Condition:

(a) "Charge" means for the purposes of paragraph AAA4(CO).7, the charge (being in all cases the amounts offered or charged by the Dominant Provider) to a Communications Provider for the Charge Controlled Service;
(b) "Charge Change" means a change to any of the charges for the provision of Call Origination Services;
(c) "Charge Controlled Service" means a product or service which forms part of (or is comprised in) the provision of Call Origination Services;
(d) "Controlling Percentage" is to be determined in accordance with paragraph AAA4(CO).6

(e) "Leap Year" means the Relevant Year beginning on 1 October 2011 and ending on 30 September 2012;
(f) "Ofcom" means the Office of Communications
(g) "Percentage Change" has the meaning given to it in paragraph AAA4(CO).3;
(h) "Relevant Financial Year" means the period of 12 months ending on 31 March immediately preceding the Relevant Year in question;
(i) "Relevant Year" means any of the four periods of 12 months beginning on 1 October starting on 1 October 2009 and ending on 30 September 2013;
(j) "Retail Prices Index" means the index of retail prices compiled by an agency or a public body on behalf of Her Majesty's Government or a governmental department (which is the Office of National Statistics at the time of publication of this Notification) from time to time in respect of all items.

SCHEDULE 2

Setting of SMP services conditions BA4 as a result of the market power determination made by Ofcom in the Notification to the Review of the fixed narrowband services wholesale markets dated 15 September 2009 in respect of the services market for call termination in the United Kingdom but excluding the Hull Area in which it has been determined that BT is a person having significant market power.

1. In Schedule 2 to Annex 7 of the Review of the fixed narrowband services wholesale markets, there shall be set the following SMP services condition BA4, inserting it after Condition BA3.

"Condition BA4

Charge control – Call Termination

BA4.1 Without prejudice to the generality of Condition BA3, and subject to paragraphs BA4.2, BA4.4 and BA4.5, the Dominant Provider shall take all reasonable steps to secure that, at the end of each Relevant Year, the Percentage Change (determined in accordance with paragraphs BA4.3) in the aggregate of charges for Call Termination Services is not more than the Controlling Percentage (determined in accordance with paragraph BA4.6).

BA4.2 For the purpose of complying with paragraph BA4.1, the Dominant Provider shall take all reasonable steps to secure that the revenue it accrues as a result of all individual Charge Changes during any Relevant Year shall be no more than that which it would have accrued had all of those Charge Changes been made at 1 April in the Relevant Year in question. The Dominant Provider shall be deemed to have satisfied this obligation where, by example in the case of a single Charge Change in the Relevant Year in question, the following formula is satisfied:

$RC(1-D) \leq TRC$

where:

RC is the revenue change associated with the single Charge Change made in the Relevant Year in question, calculated by the relevant Percentage Change immediately following the Charge Change multiplied by the revenue accrued during the Relevant Financial Year;

TRC is the target revenue change required in the Relevant Year in question to achieve compliance with paragraph BA4.1, calculated by the Percentage Change required in the Relevant Year in question to achieve compliance with paragraph BA4.1 multiplied by the revenue accrued from the provision of the Call Termination Services during the Relevant Financial Year; and

D is the elapsed proportion of the Relevant Year in question, calculated as:

(i) for any Relevant Year other than the Leap Year the date on which the Charge Change takes effect, expressed as a numeric entity on a scale ranging from 1 October = -182 to 30 September = 182, divided by 183.

(ii) for the Leap Year, the date on which the Charge Control takes effect expressed as a numeric entity on a scale ranging from 1 October = -183 to 30 September = 182, divided by 183.

BA4.3 The Percentage Change shall be calculated for the purposes of complying with paragraph BA4.1 by employing the following formula:

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

where:

C_t is the Percentage Change in the aggregate of charges for the services in Call Termination Services at a particular time t during the Relevant Year;

n is the number of individual services that form part of (or are comprised in) the provision of Call Termination Services;

R_i is the sum of the revenue accrued during the Relevant Financial Year in respect of the individual service *i* that forms part of (or is comprised in) the provision of Call Termination Services where *i* is a unique number from 1 to *n* for each of the *n* individual services in the provision of Call Termination Services;

$p_{0,i}$ is the published charge made by the Dominant Provider for the individual service *i* that forms part of (or is comprised in) the provision of Call Termination Services immediately preceding the beginning of the Relevant Year; and

$p_{t,i}$ is the published charge made by the Dominant Provider for the individual service *i* that forms part of (or is comprised in) the provision of Call Termination Services at time *t* during the Relevant Year.

BA4.4 Where the Percentage Change in the Relevant Year in question is less than the Controlling Percentage (the "Excess") then the Controlling Percentage for the following Relevant Year shall be determined in accordance with paragraph BA4.6, but increased by the absolute value of the Excess.

BA4.5 Where the Percentage Change in the Relevant Year in question is more than the Controlling Percentage (the "Deficiency") then the Controlling Percentage for the following Relevant Year shall be determined in accordance with paragraph BA4.6, but decreased by the absolute value of the Deficiency.

BA4.6 Subject to paragraphs BA4.4 and BA4.5, the Controlling Percentage in relation to any Relevant Year in question is the amount of the change in the Retail Prices Index in the period of 12 months ending on 30th June immediately before the beginning of that Year expressed as a percentage (rounded to two decimal places) of that Index as at the beginning of that period increased by 3.75 percentage points.

BA4.7 Where:

(a) the Dominant Provider makes a material change (other than to a Charge) to any Charge Controlled Service for which a Charge is charged;

(b) The Dominant Provider makes a change to the date on which its financial year ends; or
(c) there is a material change in the basis of the Retail Prices Index,

paragraphs BA4.1 to BA4.6 shall have effect subject to such reasonable adjustment to take account of the change as Ofcom may direct to be appropriate in the circumstances. For the purposes of paragraph BA4.7, a material change to the Charge Controlled Service includes (but is not limited to) the introduction of a new product and/or service wholly or substantially in substitution for an existing Charge Controlled Service.

BA4.8 The Dominant Provider shall record, maintain and supply to Ofcom in writing, no later than three months after the end of each Relevant Year, the data necessary for Ofcom to monitor compliance of the Dominant Provider with the price control by performing the calculation of the Percentage Change. The data shall include:

(a) pursuant to Condition BA4, the calculated percentage change relating to Call Termination Services;
(b) pursuant to Condition BA4.2, calculation of the revenue accrued as a result of all relevant individual charge changes during any Relevant Year compared to the target revenue change;
(c) All relevant data the Dominant Provider used in the calculation of the percentage change C_t pursuant to Conditions BA4.3;
(d) All relevant revenues accrued during the Relevant Financial Year in respect of Call Termination Services;
(e) Published charges made by the Dominant Provider at time *t* during the Relevant Year excluding any discounts offered by the Dominant Provider;
(f) The relevant published charge at the start of the Relevant Year;
(g) Other data necessary for monitoring compliance with the charge control.

BA 4.9 If it appears to Ofcom that the Dominant Provider is likely to fail to secure that the Percentage Change does not exceed the Controlling Percentage for the last relevant year beginning on 1 October 2012 and ending on 30 September 2013, the Dominant Provider shall make such adjustment to any of its charges for the provision of Call Termination Services and by such day in that Relevant Year (or if appropriate in Ofcom's opinion, by such day that falls after the end of that Relevant Year) as Ofcom may direct for the purpose of avoiding such a failure.

BA4.10 Paragraphs BA4.1 to BA4.9 shall not apply to such extent as Ofcom may direct.

BA4.11 The Dominant Provider shall comply with any direction Ofcom may make from time to time under this Condition.

BA4.12 In this Condition:

(a) "Charge" means for the purposes of paragraph BA4.7, the charge (being in all cases the amounts offered or charged by the Dominant Provider) to a Communications Provider for the Charge Controlled Service;
(b) "Charge Change" means a change to any of the charges for the provision of Call Termination Services;
(c) "Charge Controlled Service" means a product or service which forms part of (or is comprised in) the provision of Call Termination Services;
(d) "Controlling Percentage" is to be determined in accordance with paragraph BA4.6

(e) "Leap Year" means the Relevant Year beginning on 1 October 2011 and ending on 30 September 2012;
(f) "Ofcom" means the Office of Communications
(g) "Percentage Change" has the meaning given to it in paragraph BA4.3;
(h) "Relevant Financial Year" means the period of 12 months ending on 31 March immediately preceding the Relevant Year in question;
(i) "Relevant Year" means any of the four periods of 12 months beginning on 1 October starting on 1 October 2009 and ending on 30 September 2013;
(j) "Retail Prices Index" means the index of retail prices compiled by an agency or a public body on behalf of Her Majesty's Government or a governmental department (which is the Office of National Statistics at the time of publication of this Notification) from time to time in respect of all items."

SCHEDULE 3

Setting of SMP services conditions PA1 as a result of the market power determination made by Ofcom in the Notification to the Review of the fixed narrowband services wholesale markets dated 15 September 2009 in respect of the services markets for call origination and call termination in the United Kingdom but excluding the Hull Area in which it has been determined that BT is a person having significant market power.

1. The following SMP services condition PA1 shall be set:

"Condition PA1

Charge control – PPP and Interconnection Circuits

PA1.1 Without prejudice to the generality of Condition AAA3 and BA3, and subject to paragraphs PA1.2, PA1.4 and PA1.5, the Dominant Provider shall take all reasonable steps to secure that, at the end of each Relevant Year, the Percentage Change (determined in accordance with paragraphs PA1.3) in:

(a) the aggregate of charges for PPP per call per minute; and
(b) the aggregate of charges for Interconnection Circuits

in each of sub-paragraphs (a) and (b) above is not more than the Controlling Percentage (determined in accordance with paragraph PA1.6).

PA1.2 For the purpose of complying with paragraph PA1.1, the Dominant Provider shall take all reasonable steps to secure that the revenue it accrues as a result of all individual Charge Changes during any Relevant Year shall be no more than that which it would have accrued had all of those Charge Changes been made at 1 April in the Relevant Year in question. The Dominant Provider shall be deemed to have satisfied this obligation where, by example in the case of a single Charge Change in the Relevant Year in question, the following formula is satisfied:

$RC(1-D) \leq TRC$

where:

RC is the revenue change associated with the single Charge Change made in the Relevant Year in question, calculated by the relevant Percentage Change immediately following the Charge Change multiplied by the revenue accrued during the Relevant Financial Year;

TRC is the target revenue change required in the Relevant Year in question to achieve compliance with paragraph PA1.1, calculated by the Percentage Change required in the Relevant Year in question to achieve compliance with paragraph PA1.1 multiplied by the revenue accrued from the provision of the services or categories of services specified in paragraphs PA1.1(a) to PA1.1(b) during the Relevant Financial Year; and

D is the elapsed proportion of the Relevant Year in question, calculated as:

(i) for any Relevant Year other than the Leap Year the date on which the Charge Change takes effect, expressed as a numeric entity on a scale ranging from 1 October = -182 to 30 September = 182, divided by 183.

(ii) for the Leap Year, the date on which the Charge Control takes effect expressed as a numeric entity on a scale ranging from 1 October = -183 to 30 September = 182, divided by 183.

PA1.3 The Percentage Change shall be calculated separately for each of:

(i) the category of service specified in paragraph PA1.1(a); and
(ii) the category of service specified in paragraph PA1.1(b),

by employing the following formula:

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

where:

C_t is the Percentage Change in the aggregate of charges for the provision of services in the category of services in question at a particular time t during the Relevant Year;

n is the number of individual services that form part of (or are comprised in) the provision of services in the category of services in question;

R_i is the sum of the revenue accrued during the Relevant Financial Year in respect of the individual service i that forms part of (or is comprised in) the provision of services in the category of services in question where i is a unique number from 1 to n for each of the n individual services in the provision of services in the category of services in question ;

$p_{0,i}$ is the published charge made by the Dominant Provider for the individual service i that forms part of (or is comprised in) the provision of services in the category of services in question immediately preceding the beginning of the Relevant Year; and

$p_{t,i}$ is the published charge made by the Dominant Provider for the individual service i that forms part of (or is comprised in) the provision of services in the category of services in question at time t during the Relevant Year.

PA1.4 Where the Percentage Change in the Relevant Year in question is less than the Controlling Percentage (the "Excess") then the Controlling Percentage for the following Relevant Year shall be determined in accordance with paragraph PA1.6, but increased by the absolute value of the Excess.

PA1.5 Where the Percentage Change in the Relevant Year in question is more than the Controlling Percentage (the "Deficiency") then the Controlling Percentage for the following Relevant Year shall be determined in accordance with paragraph PA1.6, but decreased by the absolute value of the Deficiency.

PA1.6 Subject to paragraphs PA1.4 and PA1.5, the Controlling Percentage in relation to any Relevant Year in question is the amount of the change in the Retail Prices Index in the

period of 12 months ending on 30th June immediately before the beginning of that Year expressed as a percentage (rounded to two decimal places) of that Index as at the beginning of that period:

(a) in respect of PPP per call minute, increased by 1.50 percentage points; and
(b) in respect of Interconnection Circuits, increased by 3.75 percentage points.

PA1.7 Where:

(a) the Dominant Provider makes a material change (other than to a Charge) to any Charge Controlled Service for which a Charge is charged;
(b) The Dominant Provider makes a change to the date on which its financial year ends; or
(c) there is a material change in the basis of the Retail Prices Index,

paragraphs PA1.1 to PA1.6 shall have effect subject to such reasonable adjustment to take account of the change as Ofcom may direct to be appropriate in the circumstances. For the purposes of paragraph PA1.7(a), a material change to the Charge Controlled Service includes (but is not limited to) the introduction of a new product and/or service wholly or substantially in substitution for an existing Charge Controlled Service.

PA1.8 The Dominant Provider shall record, maintain and supply to Ofcom in writing, no later than three months after the end of each Relevant Year, the data necessary for Ofcom to monitor compliance of the Dominant Provider with the price control by performing the calculation of the Percentage Change. The data shall include:

(a) pursuant to Condition PA1, the calculated percentage change relating to each category of service listed in paragraphs PA1.1(a) and PA1.1(b);
(b) pursuant to Condition PA1.2, calculation of the revenue accrued as a result of all relevant individual charge changes during any Relevant Year compared to the target revenue change;
(c) All relevant data the Dominant Provider used in the calculation of the percentage change C_t pursuant to Conditions PA1.3 including for each specific service *i*;
(d) All relevant revenues accrued during the Relevant Financial Year in respect of the specific service;
(e) Published charges made by the Dominant Provider at time *t* during the Relevant Year excluding any discounts offered by the Dominant Provider;
(f) The relevant published charge at the start of the Relevant Year;
(g) Other data necessary for monitoring compliance with the charge control.

PA 1.9 If it appears to Ofcom that the Dominant Provider is likely to fail to secure that the Percentage Change does not exceed the Controlling Percentage for the last relevant year beginning on 1 October 2012 and ending on 30 September 2013, the Dominant Provider shall make such adjustment to any of its charges for the provision of services in the category of services in question and by such day in that Relevant Year (or if appropriate in Ofcom's opinion, by such day that falls after the end of that Relevant Year) as Ofcom may direct for the purpose of avoiding such a failure.

PA1.10 Paragraphs PA1.1 to PA1.9 shall not apply to such extent as Ofcom may direct.

PA1.11 The Dominant Provider shall comply with any direction Ofcom may make from time to time under this Condition.

PA1.12 In this Condition:

(a) "Charge" means for the purposes of paragraph PA1.7, the charge (being in all cases the amounts offered or charged by the Dominant Provider) to a Communications Provider for the Charge Controlled Service;
(b) "Charge Change" means a change to any of the charges for the provision of services in the category of services in question;
(c) "Charge Controlled Service" means a product or service which forms part of (or is comprised in) the provision of services in the category of services in question;
(d) "Controlling Percentage" is to be determined in accordance with paragraph PA1.6
(e) "Leap Year" means the Relevant Year beginning on 1 October 2011 and ending on 30 September 2012;
(f) "Ofcom" means the Office of Communications
(g) "Percentage Change" has the meaning given to it in paragraph PA1.3;
(h) "Relevant Financial Year" means the period of 12 months ending on 31 March immediately preceding the Relevant Year in question;
(i) "Relevant Year" means any of the four periods of 12 months beginning on 1 October 2009 and ending on 30 September 2013;
(j) "Retail Prices Index" means the index of retail prices compiled by an agency or a public body on behalf of Her Majesty's Government or a governmental department (which is the Office of National Statistics at the time of publication of this Notification) from time to time in respect of all items.

PA1.13 For the purposes of interpreting this Condition:

(a) Except for references made to identified services markets in paragraph PA1.14 and except insofar as the context otherwise requires or as defined in paragraph PA1.12, words or expressions shall have the meaning ascribed to them in Part 1 of Schedule 1 or (as the case may be) Part 1 of Schedule 2 to the Notification to the Review of the fixed narrowband services wholesale markets dated 15 September 2009 (set out at Annex 7 of that document) and otherwise any word or expression shall have the same meaning as it has been ascribed in the Communications Act (c. 21);
(b) headings and titles shall be disregarded;
(c) the interpretation Act 1978 (c. 30) shall apply as if the Notification were an Act of Parliament

PA1.14 The Conditions shall apply to each of the following markets and to Interconnection Circuits:

(a) wholesale call origination on a fixed narrowband network;
(b) wholesale fixed geographic call termination,

in each market of which the Dominant Provider has been determined to have significant market power.

Annex 2

The NCC Cost Model

Introduction

A2.1 The following annex outlines Ofcom's cost modelling methodology. The Ofcom model is used to determine the values of X covered by the Network Charge Control (NCC) over the period 2009/10-2013/14. The remainder of this annex contains:

- Key Model Calculations;
- Capital and operating cost calculations;
- Hypothetical ongoing network base year adjustments; and
- Other key inputs

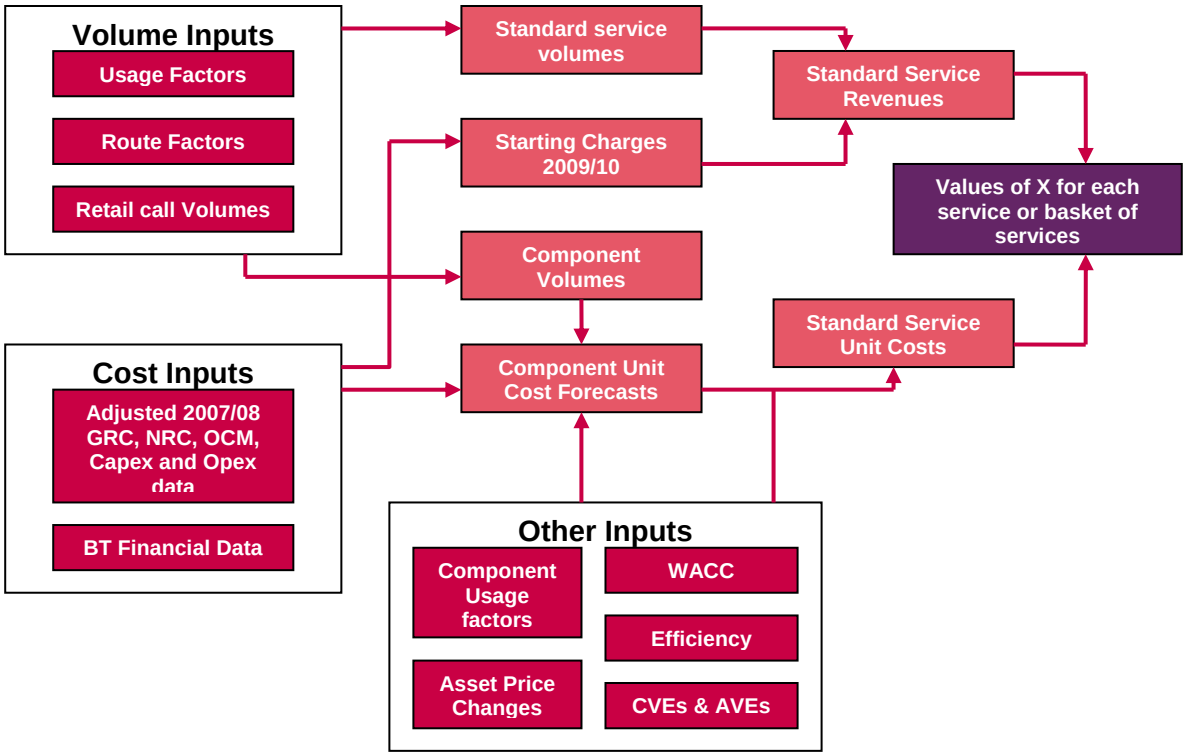
This annex also explains the updates and revisions to our cost model following responses and developments since the March consultation. A non-confidential version of the model is available on our website.[45]

A2.2 The structure of the model is illustrated below. The input and data assumptions are used to forecast the unit cost of each PSTN component used in the delivery of NCC services[46]. These component costs are used to determine the standard service costs (such as origination and termination). The standard service X factor (i.e. X in the RPI+/-X formula) is set so that costs and revenues are equal in the final year of the charge control.

[45] http://www.ofcom.org.uk/consult/condocs/review_bt_ncc/

[46] For termination and origination these components would include Local Exchange Concentrator, Local Exchange Processor, Remote Local Transmission Link and Remote Local Transmission Length.

Figure A2.1 The NCC model structure



Key Model Calculations

A2.3 The model performs five key calculations:

- calculation of network component volumes using call volume forecasts by call type;
- calculation of total network capital costs;
- calculation of total network operating costs;
- calculation of total unit costs (i.e. capital and operating costs) by service type; and
- calculation of the value of X for each regulated service.

The calculations are described in detail in the following paragraphs. Calculations are all performed in real terms with a base year of 2007/08.

Calculations of network component volumes

A2.4 Network component volumes are calculated as the product of call volumes by call type (for each type of call that passes over BT's network) and the associated routing factor by PSTN network component type.

Calculation of capital costs

A2.5 The total capital costs are calculated in three stages:

- the "steady state", i.e. no volume growth, level of costs is forecast;
- the "additional", i.e. caused by volume change, level of costs is forecast; and
- total network costs are obtained by summing the "steady state" and "additional" costs.

Table A2.1 Abbreviations used in cost forecast

Abbreviation	Description
GRC (t)	The value of Gross Replacement Cost (GRC) in year t (taken as a year-end figure)
NRC (t)	Net Replacement Cost in year t
Capex (t)	Capital expenditure in year t
Disp (t)	Disposals in year t
OCM dep (t)	Operating Capability Maintenance depreciation in year t
NCA (t)	Net Current Assets in year t
Eff	The percentage reduction in costs arising from efficiency gains
ChP(t)	The change in price of an asset at time t

A2.6 The hypothetical ongoing network leads to the following capital cost calculations:

Table A2.2 Steady State Calculations

Calculation	Description
Gross replacement cost (GRC)	The base year (2007/08) GRC values by asset type and component type are the volume adjusted values starting from the base year (03/04) of the previous NCC model. The forecasts are calculated as the addition of: a) the previous year GRC multiplied by the asset price trend; and b) the difference between the current year capital expenditure and the current year disposals. GRC(t) = GRC(t-1)*(1+ChP(t)) + (Capex(t) – Disp(t))
Operating capability maintenance (OCM) depreciation	The base year (2007/08) OCM depreciation is calculated by dividing the GRC by the calculated asset lives. OCM dep(t) = GRC(t)/asset life
Capital expenditure (capex)	The base year capital expenditure is equal to the OCM depreciation. The forecasts are calculated by multiplying the previous year capex value by the real asset price change and the assumed year on year efficiency gain. Capex(t) = Capex(t-1) * (1+ChP(t)) * (1-Eff)
Disposals	It is assumed that in the base year (2007/08) disposals are equal to capex. The forecasts are calculated by inflating prior year values by the real asset price trend. Disposals(t) = Disposals(t-1) * (1+ChP(t))
Net replacement cost (NRC)	The base year (2007/08) NRC values by asset type and component type, are volume and efficiency adjusted values starting from the base year (03/04) of the previous NCC model. This is done by using the NRC/GRC ratio

	from the start of the previous control applied to the modelled GRC for the new base year (2007/08). The forecasts are calculated as the addition of the previous year NRC multiplied by the asset price trend and the difference between the current year capex and the current year OCM depreciation. NRC(t) = NRC(t-1) * (1+ChP(t)) + (Capex(t) – OCM dep(t))
Net current asset (NCA)	The base year (2007/08) NCA values by component type are set to zero. NCA is assumed to be zero for the period of the charge control. Given the adjustments that we have made to base year costs it would not be appropriate to use reported NCA given that we would not expect NCA to vary in a material way with volumes. In addition to this, BT's reported NCA has fluctuated between positive and negative values during the previous charge control. The average of the NCA values is close to zero. We have decided for the purpose of a hypothetical ongoing model that NCA should be set at zero for the duration of the modelled period.

Additional capital cost calculations

A2.7 The additional elements of the calculations are caused by changing volumes relative to the steady state. If volumes decline these values will be negative, if volumes increase these values will be positive.

A2.8 The base year always has the additional capital costs set to zero. By model design, in the base year there is no volume growth and so no additional capital costs.

Table A2.3 Additional capital and depreciation costs associated with volume growth

Calculation	Description
Additional Capex	The forecasts are calculated as the product of: a) the previous year total GRC multiplied by the asset price trend; b) and the AVE and the component volume change. Add Capex(t) = Total GRC(t-1) *(1 + ChP(t)) * AVE * % change vol(t)
Additional GRC	The forecast is calculated as the addition of: a) the product of the previous year additional GRC and the asset price trend; and b) the current year additional capex. Add GRC(t) = Add GRC(t-1) * (1+ChP(t)) + Add Capex(t)
Additional OCM	The forecast is calculated by dividing the current year additional GRC by the average asset life.

	Add OCM dep(t) = Add GRC(t) / asset life
Additional cumulative OCM depreciation	The forecast is calculated by multiplying the previous year additional cumulative depreciation by the asset price trend, and then adding the current year additional OCM depreciation. Cumulative Add OCM dep(t) = Cumulative Add OCM dep(t-1) * (1+ ChP(t)) + Add OCM dep(t)
Additional NRC	The forecast is calculated by subtracting the additional cumulative OCM depreciation from the additional GRC. Add NRC(t) = Additional GRC(t) – Additional cumulative OCM dep(t)

A2.9 Using the steady state and additional costs calculations the total capital and depreciation costs can be determined. The total capital cost calculations are described in Table A2.4. NCA has been assumed to be zero and not to vary with volumes so additional NCA calculations are unnecessary. An additional disposals calculation would only be necessary if any components that had additional capex also had asset lives shorter than the modelling period. If this were the case then some of the assets purchased via additional capex would fully depreciate before the end of the modelling period and would require disposal (additional disposals). This is not the case for any component.

Table A2.4 Total capital and depreciation costs

Calculation	Description
Total GRC	Sum of the steady state GRC and additional GRC. Total GRC(t) = ss GRC(t) + add GRC(t)
Total capex	Sum of the steady state capex and additional capex. Total Capex(t) = ss Capex(t) + add Capex(t)
Total NRC	Sum of steady state NRC and additional NRC. Total NRC(t) = ss NRC(t) + add NRC(t)
Total OCM depreciation	Sum of steady state and additional OCM depreciation. Total OCM(t) = ss OCM dep (t) + add OCM dep (t)
Total return on capital	Sum of steady state NCA plus total NRC, multiplied by the real pre tax cost of capital. Real return on capital(t) = (ss NRC(t) + add NRC(t) + NCA(t)) * real WACC Where NCA(t) = 0
Total holding loss	Calculated by multiplying the real price change by the total NRC. Holding loss(t) = Total NRC(t-1)*ChP(t)
Total capital and depreciation costs	Calculated by summing the return on capital plus the total OCM depreciation plus the total holding loss.

	Real total capital and dep cost(t) = Real Return on capital(t) + Total OCM (t) + Holding loss (t)

Calculation of total operating costs

A2.10 The hypothetical ongoing network adjustment leads to operating cost being calculated as described in Table A2.5.

Table A2.5 Operating cost calculations

Calculation	Description
Productivity adjusted operating cost change	This is the operating expenditure price changes calculated as the combined effect of factor price changes and assumed efficiency gain, split by pay and non-pay categories. Prod Adj(t) = (1+ChP(t))*(1-eff)
Total operating costs (non-pay)	The base year data for 2007/08 is calculated as the volume and efficiency adjusted level from the previous NCC base year of 2003/04. The forecast is calculated by multiplying the previous year value by the productivity adjusted operating cost change, and the product of the component volume change with the CVE for the non-pay cost category. Non-pay(t) = Non-pay(t-1) * Prod Adj(t) * (1+ % change vol(t) * CVE)
Total operating costs (pay)	The base year data for 2007/08 is calculated as the volume and efficiency adjusted level starting from the previous NCC base year of 03/04. The forecast is calculated by multiplying the previous year value by the productivity adjusted operating cost change, and the product of the component volume change with the CVE for the pay cost category. Pay(t) = Pay(t-1) * Prod Adj(t) * (1+ % change vol(t)* CVE)
Total operating expenditure	The sum of the total non-pay and pay operating costs.

Calculation of total unit costs by service type

A2.11 Using the total capital costs and operating costs, the total costs are calculated as described in Table A2.6.

Table A2.6 Total costs

Calculation	Description
Real Total costs	Sum of the total capital costs (Table A2.5) and the total operating costs (Table A2.6) by component.
Real Total unit costs	The ratio of real total costs by component to network component volumes.

Real Unit costs by service type	Product of the real unit costs by component (on a per minute or per circuit basis) and the usage factors by component type for each service.

Starting price adjustments and calculation of X

A2.12 The key outputs of the model are the calculation of the value of X for the following services:

- call termination;
- call origination;
- interconnect specific basket (ISB); and
- product management, policy and planning (PPP).

A2.13 For each service, the value of X is determined so as to ensure zero supernormal profits by the end of the charge control period measured on a FAC basis. Supernormal profits are calculated as the difference between total revenues and total costs (including the return on capital employed at BT's WACC) for each service. In this NCC total revenues start below total costs (including the cost of capital) on a FAC basis. In the final year of the charge control the unit charge is equal to the unit cost on a modelled FAC basis.

A2.14 The calculation of X for each basket is summarised in Table A2.7. There are some differences introduced for some of the services which are outlined in the following paragraphs.

Table A2.7 Calculation of the value of X

Calculation	Description
Unit charges	The average charge for 2009/10 is provided by BT. The values of X for the new charge control period are calculated by the model so that there are no super-normal profits by 2013/14. Where two or more services fall within the same basket (such as for Call Origination), the sum of their costs is set equal to the sum of their revenues by the end of the charge control period.
Total revenues	The product of unit revenues and service volumes.
Unit costs	As explained in table A2.7
Total costs	The product of unit costs and service volumes
Supernormal profits	Calculated as the difference in total revenues and total costs on a FAC basis for each service. X is set so that supernormal profits for 2013/14 are equal to zero for each service or basket of services.

Call origination and call termination

A2.15 Call origination and call termination are subject to different values of X as calculated by the model. The two key reasons for this difference are: a) the different margins between charges and costs at the start of the control period where call termination has a lower margin than call origination and b) the extra costs of intermediate services such as emergency and operator assistance (OA) that need to be recovered via call origination (but not call termination).

ISB

A2.16 The ISB basket is modelled separately as the cost drivers (circuits rather than minutes) and individual cost components (circuits rather than PSTN network components) making up this basket are different to those of the core model. Due to a lack of granularity for ISB data in the previous NCC, the ISB base year costs have been calculated as reported by BT's in 2004/05 rather than the 2003/04 data used for other components. The NRC/GRC ratio for the new base year 2007/08) is set equal to the starting ratio from 2004/05. The ISB components do not appear quite so fully depreciated state as some of the PSTN components, however the data does show some evidence of them becoming increasingly depreciated. Therefore, the asset lives are calculated in the same way as for the rest of the NCC model, but using the weighted average over 4 years rather than 5. The approach taken to model the ISB basket can be summarised as follows:

- The basket consists of the following services: Customer Sited Interconnect (CSI), Intra Building Circuit (IBC), Interconnection Extension Circuit (IEC), Re-arrangements and In Span Interconnect (ISI);
- Base year revenues are determined from BT's financial statements for 07/08;
- Unit forecast costs are calculated as total forecast costs divided by total volumes (i.e. number of circuits).
- As with other cost calculations these costs are functions of forecast values for exogenous variables such as asset volume elasticities (AVE), cost volume elasticity (CVE), efficiency gain, input price changes and volumes changes. As with the other components, we have used the same AVEs and CVEs for ISBs as were used in the last NCC. These values are 0.59 for the AVE and 0.45 for the CVE.
- Volume changes for ISB components are taken from BT forecasts. Where BT was unable to provide forecasts, the volumes are assumed to decline at the same rate as total call volumes. These forecasts were verified against our own internal forecasts of total call volumes – as explained below.

PPP

A2.17 PPP is subject to controls that are separate from the other baskets. The cost drivers for the two services are different. PPP costs are largely salary related and are driven by the interconnecting activity of other operators. PPP is used in all the charge controlled services. PPP is charged on a per minute per call basis. The volume forecasts for PPP are based on the decline in total retail call volumes.

A2.18 The deregulation of single transit and LTC will also imply that the PPP costs associated with those services will now be recovered outside of the NCC. The costs

of PPP associated with ST and LTC are removed from the pot of PPP costs to be recovered from the remaining NCC services based on the share of NCC revenue accounted for by these services. We also remove the revenue associated with PPP on ST and LTC. As PPP is charged on per call rather than per service basis, the only revenues that are removed are those on calls that use ST and LTC but not other standard services.

Model periods

A2.19 The model uses the calculated base year data from the previous NCC model (which was 03/04) and then calculates costs for the current base year of 07/08 based on observed volumes, the efficiency savings, and asset price trends from the previous model. The model then forecasts cost values between 2008/09 and 2013/14. The next NCC period starts on 1 October 2009 which is half way through financial year 2009/10.

Hypothetical ongoing network base year adjustments

A2.20 As has been discussed in Section 4, Ofcom is modelling a hypothetical ongoing network based on PSTN components. The base year costs are the starting costs for our hypothetical ongoing network model. It is these base year costs that are used to determine the standard service cost forecasts. These base year costs are designed to reflect an ongoing network. In previous charge controls starting values of Gross Replacement Cost (GRC), Net Replacement Cost (NRC) and Operating Capability Maintenance (OCM) were taken from BT's regulatory financial statements (RFS). In principle we would wish to use the most recently reported data for our cost modelling. However, we are concerned that the 2007/08 RFS data is not suitable for modelling a hypothetical ongoing network. [47]

A2.21 PSTN components have become heavily depreciated. Ofcom believes that the reported level of costs for PSTN assets do not reflect an ongoing network. As such, some adjustment must be made to base year data to reflect an ongoing network. The level of reported GRC is higher than we would expect given the decrease in volumes during the previous charge control. If an asset has a AVE greater than zero, a decrease in volumes will cause a decrease in the GRC. However, the level of reported NRC is lower than we might expect for an ongoing network. BT's RFS also include the cost of 21CN components. The Ofcom hypothetical ongoing network cost model is based on PSTN components so the cost of these 21CN components has been removed.

A2.22 The 21CN components can be easily removed by only including the PSTN component costs in the model. Due to the depreciated nature of the PSTN, the costs associated with its components are not robust. In particular, we might expect the reported NRC to be too low but the operating costs to be higher than would be appropriate for an ongoing network. Although BT's reported costs require adjustments if they are to reflect an ongoing network, the size of these adjustments is by no means clear.

A2.23 Adjustments could be made to the NRC by setting an ongoing network NRC/GRC ratio and determining the NRC values from the GRC. Clearly, this adjustment would require the reported GRC to be at the correct level. As stated above we believe that for some components, GRC is above the level appropriate given the decline in

[47] At the time of writing 2008/09 data was recently made available but suffers from the same problems as the 2007/08 reported data.

volumes over the previous charge control period. This is illustrated in the table below.

Table A2.8 RFS and modelled GRC in 2007/08

	GRC 07/08	GRC 07/08 Modelled
Local Exchange Concentrator (£k)	1,310,799	1,064,908
Local Exchange Processor (£k)	1,319,612	1,087,982
Remote local transmission Link (£k)	206,972	243,324
Remote local transmission Length (£k)	719,412	849,332

A2.24 An alternative approach is to set the base year costs from the previous NCC data. The base year data (03/04) used in setting the current charge control was assumed to be at an ongoing network level. By adjusting these 03/04 costs for volumes, efficiency and asset price changes we have projected base year values for 2007/08 for a hypothetical ongoing network. Details of these adjustments are outlined below.

Base Gross Replacement Cost

A2.25 The base year GRC is determined from base year data in the previous NCC model (i.e. from 03/04). This GRC figure is adjusted downwards to account for the observed decline in volumes (as opposed to the then forecast decline), falling asset prices, and efficiency savings based on the target set in the 2005 NCC statement.

NRC/GRC Ratio

A2.26 The ratio between NRC and GRC at the start of the previous charge control was assumed to be at an ongoing network level. Ofcom believes that NRC should be adjusted so that the ratio of NRC to GRC is the same as at the start of the previous charge control. The NRC in the 2007/08 base year is therefore derived from the projected 07/08 GRC and application of this "ongoing network" NRC/GRC ratio.

Base Operating Capability Maintenance

A2.27 Due to the extension of accounting asset lives for PSTN assets, the base reported value for OCM depreciation is low. If the reported OCM values were used in the calculation of asset lives for our model (i.e. derived asset life equates the ratio of GRC to OCM) this would produce unrealistic results. In the consultation document we used the implied asset lives from the start of the previous charge control period to calculate the OCM depreciation for a hypothetical ongoing network. However since this time our view of the appropriate asset life assumption has changed. This justification and the consequences of this change are outlined in the next subsection.

Base Capital Expenditure

A2.28 Given the adjustments made to GRC, NRC and OCM it is consistent to also adjust the capital expenditure to reflect a hypothetical ongoing network. In a steady state (i.e. zero volume change), and if actual asset lives have been correctly set, then capital expenditure should be equal to OCM depreciation. Base year capital expenditure is therefore set to equal base year adjusted OCM.

Base Operating Costs

A2.29 Just as the capital costs need a hypothetical ongoing network adjustment, so do the operating costs. It is reasonable to expect that as the PSTN declines the cost of maintaining that network will increase. The result of higher maintenance costs is operating costs that are above the hypothetical ongoing network level. From the data received from BT there is no robust way to adjust the recently reported operating costs to reflect a hypothetical ongoing network.

A2.30 To adjust the base operating costs to the hypothetical ongoing level, and for consistency with the capital costs, the previous NCC model base values are used (i.e. 03/04). These values are adjusted for the observed decline in volumes (as opposed to the forecast decline) the relevant asset price trend, and efficiency (based on the target set in 2005). These adjustments provide the base values (i.e. in 2007/08) for operating costs in this charge control.

Adjustments to reflect longer usage of the PSTN

A2.31 Ofcom has built a hypothetical ongoing network model that is based on BT's PSTN. In the consultation document the values used for asset lives were the same values as used in the previous NCC modelling. As explained above, these asset lives were calculated as the Gross Replacement Cost divided by the Operating Capability Maintenance (OCM) depreciation (GRC/OCM) using the 2003/04 RFS. These asset lives were used to calculate the OCM depreciation going forward for our new modelling period (i.e. GRC/Asset Life). The 2007/08 implied asset lives were not used because they were considered to be artificially long. As BT is using its PSTN assets for longer than originally planned the remaining asset value is spread over the remaining extended asset life thereby depressing the OCM depreciation going forward (a more detailed description of this problem is given below).

A2.32 Some respondent to the consultation have suggested that we should model the depreciated state of BT's network (what we refer to as a legacy network extension model) because BT has lower capital expenditure in this model. However, modelling a depreciated network increases the likelihood that we provide inefficient investment signals to BT. Because of the uncertainty regarding BT's plans, the current levels of capex and capital employed *do not* reflect an ongoing network. However, if we were to move towards a legacy network extension approach we would need to undertake significant remodelling of the opex. That is, we would expect opex to increase in order to allow the ongoing use of near fully depreciated assets. Knowing how this inverse relationship between the level of depreciation and opex will manifest itself may only become clear once BT's PSTN continuation project is further progressed. Potentially this network could cost more to run than an ongoing network in the medium to long-run if the opex were high enough. Rather than take a legacy network extension approach we have opted for an abstraction from BT's actual network operations (including what happens to current 21CN equipment and any subsequent parallel running) by using a hypothetical ongoing network based on PSTN components.

A2.33 Due to the delay in 21CN roll-out and the continuing use of the PSTN we now believe that our consultation assumptions regarding BT's asset lives are too short even for a hypothetical ongoing efficient network. Further evidence in support of longer asset lives come from:

- BT's regulatory financial statements - Since the last charge control BT has not been replacing its PSTN components. Some components have approached full

depreciation. A number of asset lives have been extended as the PSTN becomes increasingly depreciated.

- 21CN delay and PSTN extension - BT is currently reviewing how long it can continue to run the PSTN and how much it will cost.
- Work produced by other NRAs - In particular, the review of Eircom's asset lives produced by ComReg.[48]

Calculation of adjusted asset lives

A2.34 We believe that there is sufficient evidence to increase our asset life assumptions. As discussed previously, we do not wish to move to a legacy network extension level of asset lives. However, we wish to place our estimate of asset lives in some empirical reality. We have selected a weighted average of the implied asset lives over the past 5 years. The weighting places a heavier weight on the early years when we believe asset lives were closer to their "ongoing level".

A2.35 Below is a description of the possible component life options for those components used for the origination and termination services.

- March consultation model – These are the implied asset lives from BT's RFS in 2003/04. Calculated as GRC/OCM.
- Weighted average across 5 years –greater weight is given to the earlier years (when the RFS data were closer to an ongoing level). The exact calculation of these weights is a qualitative judgement. The weights used are n/t where n is the number of years (5) and t is the year that the asset lives are calculated (2003/04 = 1 etc). The sum of these "weight adjusted asset lives" is taken and divided by the sum of the weights to give the final asset life value.
- Legacy network extension – The asset lives implied from the 2007/08 RFS (i.e. GRC/OCM).

The effect on asset lives of each option and the consequences for termination and origination Xs are shown in Table A2.9. The values in this table assumes that all other assumptions are unchanged from the March consultation. Therefore the Xs shown in the table differ from the final Xs which result from the combination of changes to a number of model inputs made since the consultation. The final values of X are shown in the final column of Table A2.14.

Table A2.9 Calculation of the effect on asset lives

	March NCC model	Weighted average across 5 years	Legacy network extension
Local Exchange Concentrator	16	20 (22.6%)	31 (87.6%)

[48] http://www.comreg.ie/publications/consultation_and_draft_decision_-_review_of_the_regulatory_asset_lives_of_eircom_limited.43.103293.p.html

Local Exchange Processor	14	18 (30.8%)	31 (128.6%)
Remote-Local Transmission Link	18	17 (-5.3%)	19 (4.4%)
Remote-Local Transmission Length	33	32 (-2.7%)	34 (4.0%)
Termination	6.75%	4.75%	1.50%
Origination	5.75%	4.00%	1.00%

A2.36 Our preference is for the weighted average approach since this provides the most appropriate balance between, on the one-hand, the evidence of extended useful economic lifetimes for PSTN equipment, while on the other, the desire to avoid pushing asset lives into the realms of a legacy network extension model with its implications for cost variability and uncertainty (especially opex) in the medium to long-run.

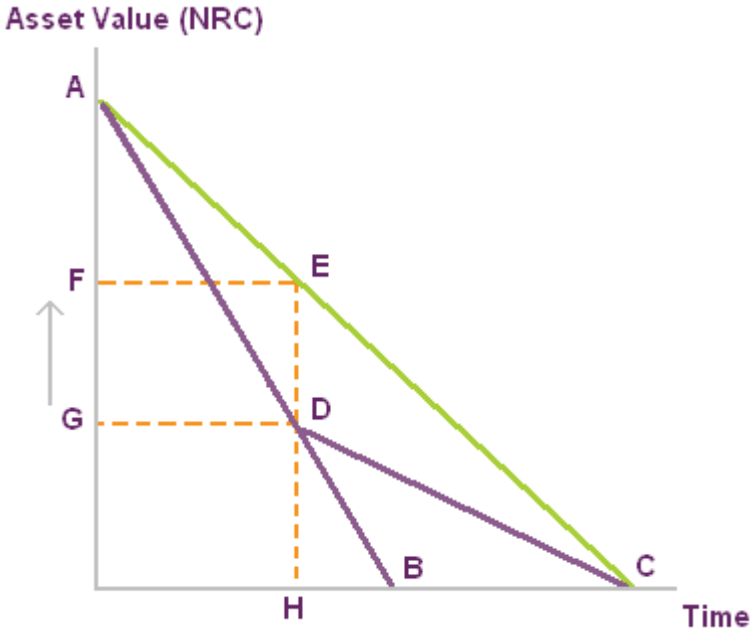
A2.37 However, making any adjustment to asset lives within the context of a hypothetical ongoing network raises further conceptual issues, namely:

- whether adjustments may also need to be made to the net asset values (NRC);
- the number of assets (i.e. the network level GRC);
- the opex; and
- the efficiency assumption.

NRC Adjustment

A2.38 If the asset lives are increased then there is a case for also increasing the net asset values (NRC). The reason for this possible uplift in NRC is demonstrated in Figure A2.2 which shows an asset depreciating over a period of time.

Figure A2.2 Asset depreciation



A2.39 In this example we are initially on line AB (with the original asset lives). In this figure point A is equal to the GRC and point G is equal to the NRC. The distance AG shows the accumulated depreciation after time H. At point D we discover that the asset lives we have been using are incorrect. We now have two options:

a) BT's accounting approach is to increase asset lives so that the remaining asset value (NRC) is spread over the remaining life of the asset (line DC). The implication of this approach is that we have much longer implied asset lives than actual asset lives.[49]

b) The alternative approach is to uplift the value of the asset (from point D (G) to point E (F)). The assets are then depreciated using the correct asset life giving the line EC. It is this second option which would give consistent asset lives and NRC values in terms of giving an efficient future path of prices from time H onwards.

A2.40 Both of the above options are potentially problematic.

- Along line DC we are setting prices based on assets that are below their economic value. Previously the allowed depreciation charge was too great meaning prices were too high. However, this does not mean we should now send incorrect economic signals going forward by setting prices too low. While this would deliver cost recovery given the previous path of prices, it requires prices to be set too low going forward compared to the efficient level (i.e. taking account of the true forward looking asset value).

- Line EC allows the correct economic value for the asset and path of prices, but over the lifetime of the asset results in over-recovery of costs if prices up to point H were based on the original higher depreciation charge.

[49] The implied asset life is the reported GRC divided by the reported yearly OCM depreciation. When the remaining NRC is depreciated over a longer period, the resulting OCM will be considerably smaller. A small yearly OCM depreciation charge will lead to very long implied asset lives when applied to the GRC.

A2.41 However, Ofcom believes that given the adjustments already made make a further adjustment to NRC is unnecessary. As outlined earlier, we already have a NRC uplift to the "ongoing level" setting the NRC above that suggested by just rolling on from the previous NCC model or by BT's current reported values in the RFS. Moving to an ongoing network means adjusting the asset values so that they reflect assets that are not valued below their future efficient value. Assuming that the NRC uplift we have applied is correct for an ongoing network the assets will have the correct value if the GRC to which the NRC/GRC ratio is applied is at the correct level – which we think is the case for an efficient ongoing network.

GRC Adjustment

A2.42 There are two possible ways that the GRC could be affected by longer asset lives. The dominant effect will depend on the accounting treatment and the cost model treatment of fully depreciated assets.

- If when assets become fully depreciated they are written out of the asset register then there could be assets in use that did not have a GRC value (and in turn, no NRC value). These fully depreciated values would need to be added back to GRC, if we adjusted the asset lives to their 'correct' values.

- Conversely, if assets were not dropping out of the asset register when they became depreciated in accounting terms we may have a GRC that is too high for the level of asset lives applied. In this case we may require a downward adjustment to the GRC to achieve the correct level for an ongoing network.

A2.43 However, we consider BT's 2003/04 accounting data to provide a good proxy for an efficient ongoing network – i.e. is unlikely to have suffered from the above effects. Therefore, using this as a basis to project the 2007/08 base year GRC (with appropriate asset price trend, volume and efficiency effects applied) is likely to yield a more robust starting GRC than if we used BT's reported 2007/08 GRC. As such, we do not consider that we need a further adjustment to GRC in our model.

Opex Adjustment

A2.44 Prima facie there might be an argument for making an adjustment to opex when we make a change to asset lives. If BT is using its assets for longer periods of time then it may be forced to increase opex to maintain the assets as they approach the end of their economic life.

A2.45 However, because we are not moving to a legacy network extension model, but rather modelling the unit costs of a hypothetical ongoing network, our modelled opex profile is assumed to be stable given past trends when the PSTN was in a steady state of maintenance and asset renewals. Nevertheless, a cross-check on the empirical relationship between opex and capital costs is useful to verify the robustness of our modelling approach.

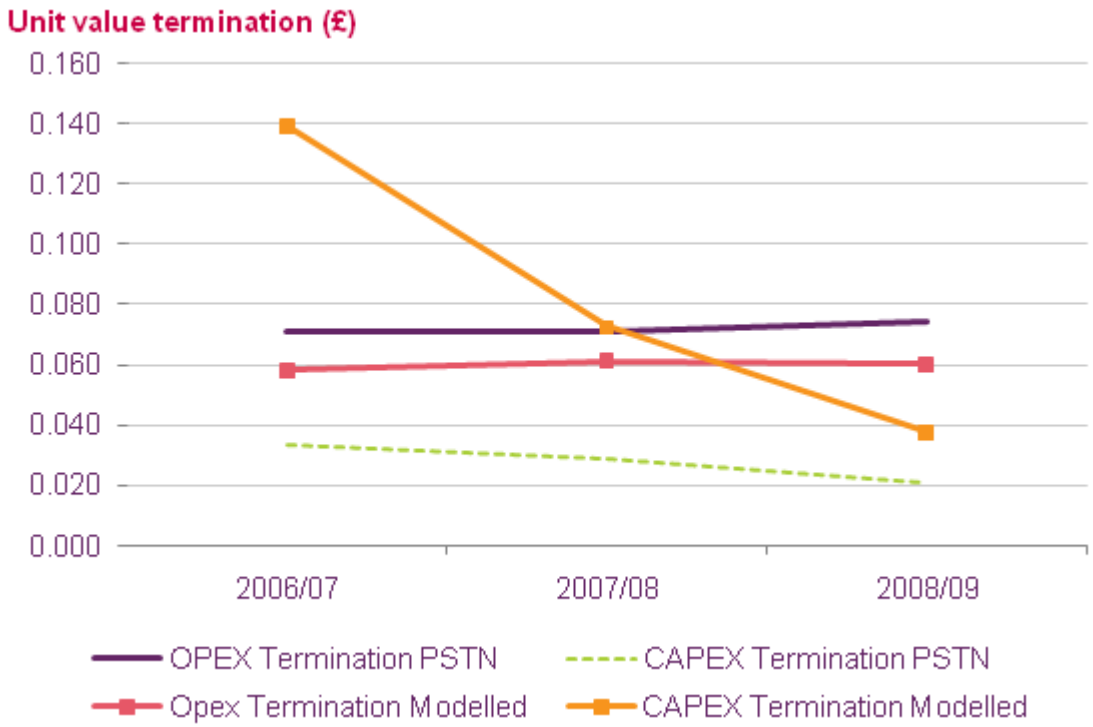
A2.46 Although unit opex has been increasing in BT's RFS it does not necessarily mean that BT is experiencing higher maintenance costs as it extends its legacy network assets. In the RFS higher unit opex could be caused by additional 21CN opex, the effect of a reduction in volumes increasing the unit cost of components, or by the increased maintenance to cover PSTN assets approaching the end of their economic lives. However, separating out these effects is difficult, particularly given the limitation of the data available to us.

A2.47 Figure A2.3 contains a comparison of the unit opex and capex from the model and BT's RFS. There are some limitations to this comparison:

- Both sets of costs are for PSTN asset only.
- Ideally there would also be a comparison including 21CN costs. This may be possible for opex, but we have no data for 21CN capex at a component level as it is not contained in the RFS.
- For ease of presentation, the figure only includes termination. The origination costs would essentially be the same as for termination. The only additional costs for origination are operator assistance costs and emergency call costs. However, we do not have these costs at a granular level so cannot split out the opex and capex.
- A direct comparison between the modelled capex and actual capex is not particularly informative. In the model capex is primarily used as a volume and efficiency adjustment mechanism for the NRC and GRC. This partly explains its steep slope as it adjusts for volumes.

A2.48 The figure shows the decrease in actual capex and the increase in actual opex that we might expect from a heavily depreciated network. In terms of verifying the robustness of our model it is helpful to note that both the modelled opex and BT's unit opex are increasing by about the same rate. In the model there is no legacy network extension effect on the unit opex (no increase in unit opex caused by maintaining depreciated assets). This implies that the observed increase in unit opex is of a magnitude that we would expect with volume declines.

Figure A2.3 Termination unit cost of capex and opex



A2.49 The evidence presented here does not suggest that BT has experienced a large increase in opex as capex has decreased – at least to date. In addition our analysis

suggests that some of the increase in unit opex that has occurred is due to the volume decline.

A2.50 Given that we are only making a relatively small adjustment to asset lives (compared to those previously assumed in the consultation) and on the basis of the above analysis we do not consider it appropriate to also adjust opex beyond that derived from the trend of opex from the previous base year (2003/04) with appropriate volume, efficiency and asset price trends applied.

Efficiency and Asset Lives

A2.51 It might be argued that the efficiency assumption should be changed when asset lives are changed. The logic here would be that part of the yearly efficiency gain is achieved by new (more efficient) assets being deployed as old ones become fully depreciated. In our hypothetical ongoing network, if asset lives are longer, assets will not be replaced as often and so arguably the yearly efficiency gain from this replacement will be smaller.

A2.52 However, this issue should not affect our hypothetical ongoing network model. We are not increasing asset lives in our model but rather we are changing our starting assumptions. We consider that the efficiency assumption we have adopted is the appropriate value to use with a correctly specified asset life assumption. For the reasons stated earlier, we consider that our asset life assumptions are consistent with a hypothetical ongoing network. The efficiency analysis of BT's network is based on historical cost data from a time when BT's network would have been closer to a hypothetical ongoing network, but where actual asset lives were steadily increasing.

Comparison of 2008/09 unit costs

A2.53 The result of the above modelling adjustments is a slightly lower 2008/09 unit cost for each service than that reported by BT in its most recent RFS. However, the unit costs for origination and termination are higher than they would be if only the PSTN costs were left unadjusted (i.e. if 21CN costs are excluded but capital costs and operating costs are not adjusted to reflect ongoing network levels).

Table A2.10 Comparison of 2008/09 unit costs

	BT Reported Unit Costs (2008/09) PPM	Modelled Unit Costs (2008/09) PPM	Unadjusted PSTN Components Unit Costs (2008/09) PPM
Termination	0.221	0.198	0.174
Origination	0.232	0.212	0.186
PPP	0.015	0.009	0.015
ISB[50]	NA	NA	NA

[50] We calculate the ISB base year costs using a different methodology to the main model. A description of these calculations can be found above.

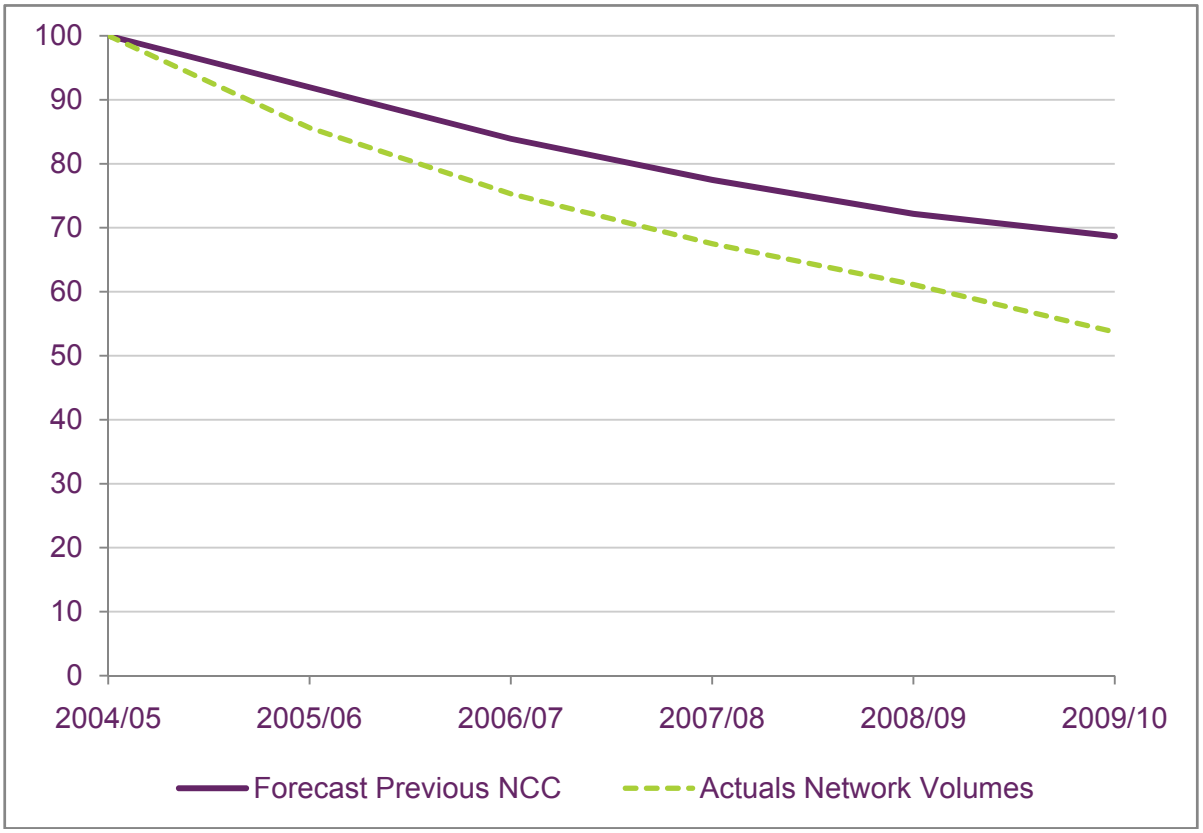
Other Inputs

Volumes

A2.54 Telecommunication networks are characterised by significant economies of scale and an increase in retail volumes, caused by market growth or increased share of traffic using BT's network, is likely to lead to a smaller proportionate increase in total costs than total revenues. Hence, BT's profitability is highly affected by total retail market growth rates and the share of traffic using BT's network. BT has provided forecasts for retail market volumes using its network over the control period. Ofcom has also prepared its own retail volume forecasts based on recent past trends of retail volumes using BT's network.

A2.55 Figure A2.4 shows the forecast and actual decline in volumes for the 2005 NCC period (note that the final year of the actuals series is a forecast). The overestimate of network volumes over the charge control period provides the key explanation for some standard service charges being below modelled costs on a FAC basis.

Figure A2.4 Indexed Volume Forecasts 2005 NCC (2004/05 = 100) and NCC indexed actual volumes



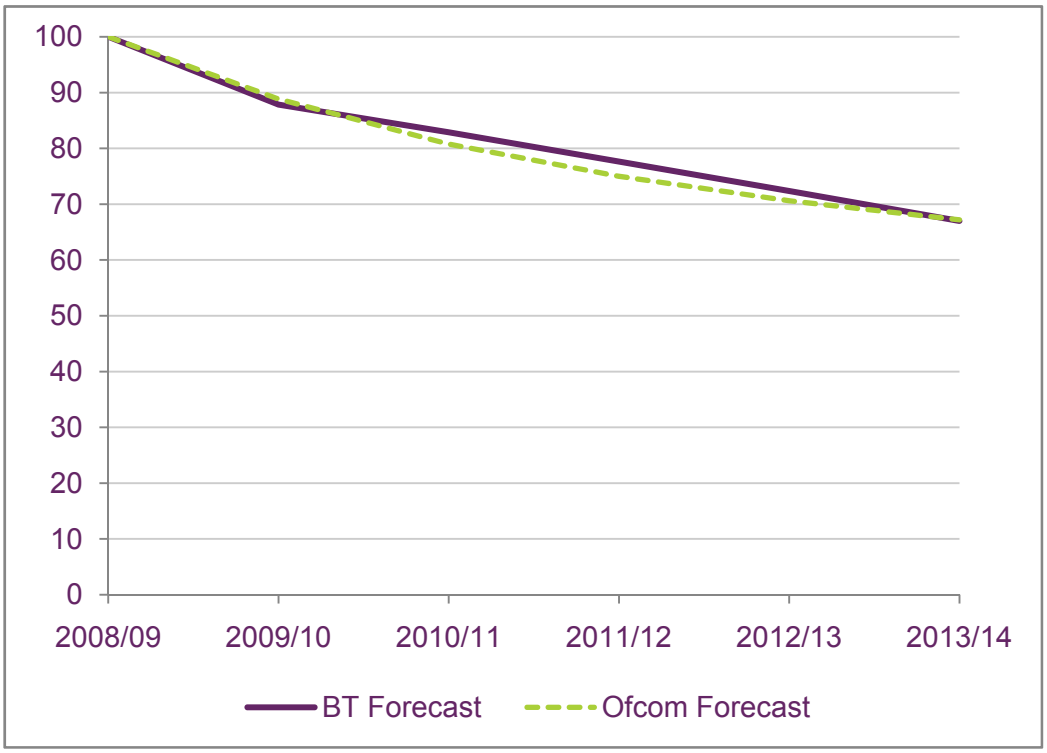
A2.56 Ofcom receives quarterly information from BT and other operators on line and retail traffic volumes as part of its ongoing market intelligence work. However, we recognise the difficulty in forecasting NCC call volumes – particularly given recent market and technology developments. The large decline in volumes during the previous charge control requires careful attention if trends are to be applied for future volume forecasts.

A2.57 Ofcom has looked at recent trends in these data, together with additional information provided by BT in the context of this review, to produce forecasts of volumes over the next NCC period. Where possible, call volumes for each call type are calculated as the product of the moving average number of calls per line and the average number of lines. The average number of lines is based on the forecasts used by Ofcom in the Openreach Financial Framework.

A2.58 Ofcom's retail volume forecasts produce similar levels of volume decline to the forecasts provided by BT. Ofcom feels that the forecasts provided by BT are likely to better reflect volume changes because they explicitly capture effects such as the switch from CPS to BT's Wholesale call product. As such, our base case uses the volume forecasts produced by BT.

A2.59 Since the March consultation BT has submitted revised volume forecasts to Ofcom. In total these volumes are lower than those used in the consultation. However, there are increases in the call types that use the termination and origination services. The result of these new volumes is lower unit costs for these services and hence a decrease in the value of the termination and origination Xs in NCC formula. Figure A2.5 shows the indexed forecast decline in volumes from the BT and Ofcom forecasts for the period of the next NCC.

Figure A2.5 Indexed Volume Forecasts 2009 NCC (2008/09 = 100)



Efficiency

A2.60 The efficiency assumption is an important parameter in the NCC calculations. It determines the rate by which real unit capital and operating expenditure are expected to decrease year on year before taking account of volume and input price changes. It should be noted that no adjustments are made to the efficiency parameter to include the effect of anticipated savings from BT's 21CN.

A2.61 Our approach to efficiency is discussed in Section 4. In the March consultation we used a range for the yearly efficiency gain of 1-3%, with a base assumption of 2% per year. As discussed in Section 4 we have concluded that an efficiency assumption of 2.5% is appropriate.

Asset-volume elasticities (AVEs)

A2.62 An asset-volume elasticity is defined as the percentage increase in gross assets, valued at replacement cost, for a 1% increase in volume. Ofcom has assumed asset-volume elasticities of 0.38 for inland conveyance (network) costs. These are based on assumptions used in the last two NCC models, which were based on a top-down view of BT's costs.

A2.63 Ofcom has considered whether the AVEs used in the model for the next charge control period should be different to the ones used for the last charge control period due to the projected decline in PSTN volumes. Ofcom believes that the use of the same AVEs as the last charge control period is justified for the following reasons;

- *Technology Neutrality* – Allowing a reduction in the AVEs to account for volumes switching from the PSTN to BT 21CN would be inconsistent with a hypothetical ongoing network cost model,

- *Consistency* – We are rolling forward base period hypothetical network costs from the previous NCC model. To be consistent with the previous NCC model we should also use the same AVEs for this hypothetical ongoing network as were used for previous NCC cost models.

Cost-volume elasticities (CVEs)

A2.64 A cost-volume elasticity is defined as the percentage increase in costs for a 1% increase in volume. CVEs in telecommunications are typically significantly less than one, reflecting economies of scale. Ofcom has assumed a base case CVE of 0.25 for inland conveyance (network) costs. This is based on assumptions used in the last NCC model.

A2.65 Ofcom has considered whether the CVEs used should be different from those used in the last charge control because of the projected decline in PSTN volumes. Ofcom believes the CVEs should remain unchanged for the same reasons as discussed above for the AVEs.

A2.66 As already explained, in addition to declining voice traffic, BT is gradually shifting from PSTN infrastructure to a 21CN. The observed change in the quantity of PSTN components to changes in volumes is likely be affected by the switch to a new network. In this environment, new estimates for AVEs and CVEs are unlikely to be reliable. Therefore, the asset and cost volume elasticities are taken from the 2005 Network Charge Control statement, which in turn used the same CVEs and AVEs as the preceding cost model. The AVEs and CVEs for components used for call origination and call termination are outlined below.

Table A2.11 AVEs and CVEs

Asset	Asset volume Elasticity
Cable	0.55
Duct	0.05
Local Exchange	0.55
Main Exchange	0.7
Transmission	0.2
Other Ntwk Eqpt	0.65
Motor Transport	0.4
Land & Bldgs	0.2
Computer & OM	0.65
Other	0.65

Operating costs	Cost volume Elasticity
Opex – pay	0.25
Opex – non pay	0.25

Cost of Capital

A2.67 A company's cost of capital can be thought of as the minimum rate of return which investors require in order to invest in a company. In a competitive market, while annual returns in any given year may be above or below the cost of capital, over the longer term one would not expect average returns to be materially above or below this level. In the March consultation Ofcom used a range for the pre-tax nominal cost of capital between 10.25% and 11.75%. This value was based on the range determined in the Openreach Financial Framework Review second consultation.[51] We have concluded on a pre-tax nominal WACC of 11% which is consistent with the "rest of BT" rate concluded in the final statement "A new pricing framework for Openreach"[52]. The 11% nominal WACC assumes an inflation rate of 2.5%. In year 1 when we assume zero inflation we have reduced the nominal cost of capital by 2.5%.

Change in asset and other input prices

A2.68 BT has provided data on changes in nominal asset prices. The inflation adjusted average of these values has been used as the basis for forecasts of future changes in real asset prices over the next control period. This implies an average real asset price change of -2.64% overall. The breakdown of the nominal asset price changes is shown below. These are the same as used in the March consultation.

[51] See http://www.ofcom.org.uk/consult/condocs/cost_capital2/statement/final.pdf
[52] See http://www.ofcom.org.uk/consult/condocs/openreachframework/statement/statement.pdf

Table A2.12 Asset price changes provided by BT

Asset	4 Year average nominal price change
Cable	3.64%
Duct	-0.29%
Local Exchange	-2.28%
Main Exchange	-2.51%
Transmission	-5.04%
Other Ntwk Eqpt	-2.84%
Motor Transport	-2.76%
Land and Bldgs	-1.43%
Computers & OM	-2.93%
Other	-2.08%

A2.69 BT has provided data on changes in nominal prices per unit of labour and other operating inputs for the period 2004/05 to 2007/08. The average of these values has been used as the basis for forecasts of future changes in real input prices over the next NCC period. A real increase in labour costs (per unit of labour) of 0.62% per annum has been used. A real cost change of -1.22% is used for non-labour costs.

Inflation

A2.70 As explained in Section 4, Ofcom is using RPI as the inflation index in its NCC formulae. Our cost forecasts are based on a long term view of inflation. Measured by RPI, the UK economy is currently experiencing a period of deflation. This is unprecedented in recent times and adds an additional level of complexity to cost projections. Specifically, for some categories of costs, such as pay costs, which are unlikely to fall in nominal terms (at least in the short term) the historically observed link between general inflation and cost movements may no longer provide the appropriate basis for forecasting costs.

A2.71 However, Ofcom's NCC model is calculated in real terms and so the impact of the assumptions related to forecast inflation is limited. We have updated our forecast of inflation since the March consultation. To reflect the most recent data available and to be consistent with the Leased Lines Charge Control (LLCC) and Openreach Financial Framework we have used the inflation values in the table below over the charge control period. The only change from our consultation position is the figure for the first year of the charge control. These forecasts are used to determine the value of X in the RPI+/-X glide path given starting charges and efficient unit costs forecast at the end of the control period in real terms (i.e. base year 07/08 values).

Table A2.13: Inflation Assumptions

	NCC Year 1	Year 2	Year 3	Year 4
RPI Assumption	0%	2.5%	2.5%	2.5%

A2.72 Where the model uses past inflation (i.e. rather than forecasts) this has been taken from the RPI values published by the Office for National Statistics. Historic inflation is used to convert historic nominal asset and input price trends to real price trends. This in turn is used as the basis for forecasting the real asset and input price trends. Historic inflation is also used to convert starting charges to 07/08 values. Historic

inflation has been measured using the mid-point of the financial year (i.e. September) rather than the year to June as was the case in the model consulted on. This adjustment is appropriate since cost inputs to the NCC model are taken from BT's RFS which are reported on a FY basis and, moreover, the charge control is designed to align charges with costs in the final period of the charge control which will be mid-way through a financial year – i.e. in September 2013. The adjustment therefore aligns the way inflation is calculated and applied with the period for which costs and charges are modelled.

A2.73 The combined effect of the change to the measurement period for historic inflation and the revised forecast inflation for year 1 of the charge control causes a small reduction in the values of Xs for the glide path when compared to the inflation inputs and point of measurement used in the consultation model.

Final Values of X

A2.74 Ofcom has undertaken three significant changes to the base case scenario we consulted on – i.e. volumes, efficiency and asset lives. A less significant change results from the treatment of inflation described above; the results of which are also shown. These changes and their impact on the Xs are shown in the table below for the model calibrated as in the March consultation. Note for each column below that the stand alone effect of the change in question is shown. The final column shows the final Xs determined using the revised model capturing not just the combined effect of the major changes noted above but also less significant revisions to the model.

Table A2.14 the effect of key modelling changes on the values of X[53]

	Consultation Base Case (CBC)	CBC with new volumes	CBC with 2.5% efficiency	CBC with new asset lives	CBC with updated inflation	Statement Values
Termination	6.75%	6.25%	6.25%	4.75%	6.50%	3.75%
Origination	5.75%	5.25%	5.25%	4.00%	5.50%	2.75%
ISB	4.00%	4.25%	3.75%	4.00%	4.00%	3.75%
PPP	3.25%	3.00%	2.50%	2.50%	3.00%	1.50%

[53] The sum of the changes in Xs for each service (the sum of the change for each row) will not necessarily be equal to the change from the consultation base case to the statement values. Each column has been rounded to the nearest quarter percent. This rounding makes it inappropriate to simply sum the difference in X caused by each change. In addition, when the changes are combined they interact and will affect the values of X in a different way to when they are applied individually.

Annex 3

List of respondents to consultation

A3.1 A total of 15 responses were received from Communications Providers and their representative bodies. Of these 3 respondents asked for their response to be regarded as confidential and 11 agreed for their full responses, or redacted versions, to published.

A3.2 Non-confidential responses were received from:

BT
Cable & Wireless
COLT
The European Commission
Federation of Communications Services
Sky
T-Mobile
UKCTA
Virgin Media
TalkTalk
Vodafone

A3.3 These 11 non-confidential responses can be found on our website at: http://www.ofcom.org.uk/consult/condocs/review_bt_ncc/responses/

Annex 4

The legal Framework for NCCs

A4.1 The present regulatory framework for electronic communications networks and services entered into force on 25 July 2003. The framework is designed to create harmonised regulation across Europe and is aimed at reducing entry barriers and fostering prospects for effective competition to the benefit of consumers. The basis for the regulatory framework is five EU Communications Directives (together "the Directives"):

- Directive 2002/21/EC on a common regulatory framework for electronic communications networks and services ("Framework Directive");

- Directive 2002/19/EC on access to, and interconnection of, electronic communications networks and associated facilities ("Access Directive");

- Directive 2002/20/EC on the authorisation of electronic communications networks and services ("Authorisation Directive");

- Directive 2002/22/EC on universal service and users' rights relating to electronic communications networks and services , ("Universal Service Directive"); and

- Directive 2002/58/EC concerning the processing of personal data and the protection of privacy in the electronic communications sector ("Privacy Directive").

This framework is currently being reviewed, but the Community legislation has yet to adopt legislative proposals.

The Communications Act 2003

A4.2 The Framework Directive, the Access Directive, the Authorisation Directive and the Universal Service Directive were implemented in the United Kingdom on 25 July 2003 via the Communications Act 2003 ("the Act"). The Privacy Directive was implemented by separate regulations which came into force on 11 December 2003.

A4.3 In particular part 2 of the Act sets out the majority of that Act's provisions that implement the Directives. Sections 32, 45-50 and 78-90 are of particular importance. Ofcom is required to act in accordance with its general and specific duties in sections 3 and 4 of the Act, respectively.

A4.4 Under section 3, Ofcom must, in carrying out its functions further the interests of citizens in relation to communications matters and the interests of consumers in relevant markets, where appropriate by promoting competition. As to the latter Ofcom must have regard, in particular, to the interests of those consumers in respect of choice, price, quality of service and value for money. This corresponds with the policy objective in Article 8(2) of the Framework Directive.

A4.5 Section 4 of the Act requires that Ofcom acts in accordance with the six Community requirements set out at sections 4(3) to 4(9). and detailed below:

The first Community requirement is a requirement to promote competition;

The second Community requirement is a requirement to secure that Ofcom's activities contribute to the development of the European internal market;

The third Community requirement is a requirement to promote the interests of all persons who are citizens of the European Union;

The fourth Community requirement is a requirement to take account of the desirability of Ofcom's carrying out their function in a manner which, so far as practicable , does not favour

(a) one form of electronic communication network, electronic communication service or associated facility; or

(b) one means of providing or making available such a network, service or facility;

The fifth Community requirement is a requirement to encourage, to such extent as Ofcom consider appropriate, for specified purposes, the provision of network access and service interoperability. Those specified purposes are;

(a) the purpose of securing efficient and sustainable competition in the markets for electronic communications networks, electronic communications services or associated facilities; and

(b) the purpose of securing the maximum benefit for the persons who are customers of communications providers and of persons who make such facilities available;

The sixth Community requirement is a requirement to encourage such compliance with proscribed standards as is necessary for

(a) facilitating service interoperability

(b) securing freedom of choice for the customers of communications providers.

A4.6 Where it appears to Ofcom that its general duties conflict with its section 4 duties, priority must be given to the latter.

A4.7 Ofcom has, however, a wide measure of discretion in balancing its statutory duties and objectives including where they conflict. In doing so, Ofcom will take all relevant considerations into account, including consultation responses. Sections 4 and 5 of this document consider the application of duties relevant to our proposals in more detail.

Market Reviews

A4.8 The Directives require National Regulatory Authorities ('NRA') to carry out reviews of competition in communications markets to ensure that regulation remains appropriate and proportionate in the light of changing market conditions.

A4.9 Each market review normally has three stages, namely:

- definition of the relevant markets;

- assessment of competition in each market, in particular whether any undertakings have SMP in a given market; and

- assessment of appropriate regulatory obligations where there has been a finding of SMP.

Relationship between this review and Narrowband Market Reviews

A4.10 Network Charge Controls are a specific remedy that Ofcom can impose upon a market once a finding of SMP has been made in that market.

A4.11 We do not propose to set out in further detail the legal framework for the market review process in this document, and will concentrate on the framework that allows the imposition of a Charge Control regime. A detailed discussion of the underlying legal framework for the market review process is set out in the wholesale review.

A4.12 The WNMR has proposed the following markets as being markets in which a provider held SMP[54]:

- Fixed narrowband analogue exchange lines

- Fixed narrowband ISDN 2 exchange lines

- Fixed narrowband ISDN 30 exchange lines

- Call Origination

- Call Termination

A4.13 Each of those markets have been analysed and appropriate remedies to address the competitive concerns in each market have been proposed. Network Charge Controls have been proposed for the following markets in the geographic area of the UK excluding the Hull Area:

- Call origination

- Call termination

A4.14 Exchange line markets are not part of the markets within the Network Charge Control review, so this review is concerned only with the call origination and call termination markets, PPP and interconnection circuits.

A4.15 The scope of this review is required to consider in detail the proposed remedy of a charge control on network markets and put forward proposals as to their implementation. It is therefore important to set out the framework within which consideration of a Charge Control will be considered as a specific SMP remedy.

[54] http://www.ofcom.org.uk/consult/condocs/review_wholesale/statement/

SMP Remedies

Subject matter of the SMP remedies

A4.16 The third and final market review stage concerns remedies. Article 16 of the Framework Directive dictates the imposition or removal of SMP remedies depending upon whether or not a finding of SMP in an identified services market has been made. Where an SMP finding has been made, Ofcom will consider what appropriate SMP remedies are available. This process has been completed (to the point of consultation) in the wholesale review.

A4.17 Under section 45 of the Act, Ofcom is empowered generally to set SMP services conditions authorised or required by sections 87 to 92. The latter implement Articles 9 to 13 of the Access and Interconnection Directive and Articles 17 to 19 of the Universal Service Directive. In addition, Ofcom's power to set such conditions includes additional powers specified in section 45(10), such as powers to include provisions in SMP services conditions for Ofcom to make directions in respect of specified markets.

A4.18 Specifically, section 87(9)(a) empowers Ofcom to set :

> "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"

A4.19 This allows the imposition of a Charge Control regime.

A4.20 Section 46 of the Act provides that SMP services conditions set under section 45 may only be applied if the person to whom they are to apply is a communications provider (or a person who makes associated facilities available) and is a person whom Ofcom has determined to be a person having SMP in a services market. It is therefore important to consider the precise identity of the regulated entity on whom it is appropriate to impose obligations.

Regulated entity

A4.21 As noted above, section 46 provides that a person to whom an SMP services condition is applied must be a 'communications provider' or a 'person' who makes associated facilities available and a 'person' who Ofcom has determined to have SMP in a specific market for electronic communications networks, electronic communications services or associated facilities (i.e. the 'services market').

A4.22 Article 16 of the Framework Directive requires that, where an NRA determines that a relevant market is not effectively competitive, it shall identify "undertakings" with SMP on that market and impose appropriate specific regulatory obligations. For the purposes of EC competition law, "undertaking" includes companies within the same corporate group (*Viho v Commission* Case C-73/95 P [1996] ECR I-5447), for example, where a company within that group is not independent in its decision making.

A4.23 Ofcom considers it appropriate to prevent a dominant provider to whom a SMP service condition is applied, which is part of a group of companies, exploiting the principle of corporate separation. The dominant provider should not use another member of its group to carry out activities or to fail to comply with a condition, which would otherwise render the dominant provider in breach of its obligations. The only

dominant provider on whom Ofcom propose to set charge controls for the purpose of this review is BT.

The legal tests

A4.24 However, before Ofcom can set or modify SMP services conditions on such a regulated entity, it must be satisfied that certain legal tests have been satisfied in imposing the SMP condition in question.

A4.25 In Section 4 of this document, Ofcom sets out its reasons explaining why those tests would be satisfied based on evidence presently before Ofcom. The wholesale review proposed appropriate remedies in accordance with the legal tests set out below, however it remains important to apply the tests to the specific mechanics of how we propose each remedy should be applied, to ensure that they remain consistent with the requirements of the Act.

A4.26 In addition to need of satisfying the general and specific duties, the appropriateness of the remedy and identifying the nature of the competition problem mentioned above, Ofcom must satisfy a number of additional tests.

A4.27 First, under section 47(2) of the Act, Ofcom must show for each and

every SMP services condition that it is:

- *objectively justifiable* in relation to the networks, services, facilities, apparatus or directories to which it relates;
- *not such as to discriminate unduly* against particular persons or against a *particular description of persons;*
- *proportionate* to what the condition or modification is intended to achieve; and
- in relation to what it is intended to achieve, *transparent*.

A4.28 Secondly, each of the tests set out in section 87(4) of the Act which Ofcom considers relevant must be satisfied. That section requires that Ofcom:

"…must take into account, in particular, the following factors—

(a) the technical and economic viability, having regard to the state of market development, of installing and using facilities that would make the proposed network access unnecessary;

(b) the feasibility of the provision of the proposed network access;

(c) the investment made by the person initially providing or making available the network or other facility in respect of which an entitlement to network access is proposed;

(d) the need to secure effective competition in the long term;

(e) any rights to intellectual property that are relevant to the proposal; and

(f) the desirability of securing that electronic communications services are provided that are available throughout the member States."

A4.29 It is to be emphasised that this list is not exhaustive and other reasons can therefore be added by Ofcom for imposing the access obligation(s) in question.

A4.30 Thirdly, in addition to the above-mentioned tests, Ofcom must also satisfy the tests set out in section 88 of the Act in relation to network access pricing etc. obligations, namely: price control; cost orientation and cost recovery rules; use of cost accounting system rules; obligations to adjust prices.

A4.31 Section 88 only allows Ofcom to impose such obligations where:

- it appears to Ofcom from the market analysis carried out for the purpose of setting that condition that there is a relevant risk of adverse effects arising from price distortion (see below for the meaning of this term); and

- it also appears to Ofcom that the setting of the condition is appropriate for the purposes of promoting efficiency, promoting sustainable competition, and conferring the greatest possible benefits on the end-users of public electronic communications services. In considering these matters, Ofcom may have regard to the prices at which services are available in comparable competitive markets and may determine what they consider to represent efficiency by using such cost accounting methods as they think fit.

A4.32 There is a relevant risk of adverse affects arising from price distortion if the SMP designated undertaking might fix and maintain some or all of its prices at an excessively high level, or impose a price squeeze, so as to have adverse consequences for end-users of public electronic communications services.

A4.33 In addition, Ofcom must show that in setting the network access pricing obligation it has taken account of the extent of the SMP provider's investment in the matters to which the condition relates.

A4.34 It is to be noted that the term "price control" has not been defined in the EC Communications Directives. The 20th recital to the Access and Interconnection Directive suggests that it could cover a range of obligations concerning prices:

> "Price control may be necessary when market analysis in a particular market reveals inefficient competition. The regulatory intervention may be relatively light, such as an obligation that prices for carrier selection are reasonable as laid down in Directive 97/33/EC, or much heavier such as an obligation that prices are cost oriented to provide full justification for those prices where competition is not sufficiently strong to prevent excessive pricing. In particular, operators with significant market power should avoid a price squeeze whereby the difference between their retail prices and the interconnection prices charged to competitors who provide similar retail services is not adequate to ensure sustainable competition. When a national regulatory authority calculates costs incurred in establishing a service mandated under this Directive, it is appropriate to allow a reasonable return on the capital employed including appropriate labour and building costs, with the value of capital adjusted where necessary to reflect the current valuation of assets and efficiency of operations. The method of cost recovery should be appropriate to the circumstances taking account of the need to promote efficiency and sustainable competition and maximise consumer benefits."

A4.35 Article 12 of that Directive, however, expressly empowers NRAs to impose obligations on operators to meet reasonable requests for access to, and use of, specific network elements and associated facilities, *inter alia* in situations where the NRA considers that denial of access or unreasonable *terms and conditions* having a similar effect would hinder the emergence of a sustainable competitive market at the retail level, or would not be in the end-user's interest, and that NRAs may attach to those obligations conditions covering fairness, reasonableness and timeliness.

A4.36 In the light of the potential interplay between these provisions, Ofcom has addressed the section 88 test also under the requirement to provide network access on fair and reasonable terms and conditions, including charges.

ERG Common Position on Remedies

A4.37 At a plenary meeting on 18/19 May 2006, the European Regulators Group ("ERG") adopted a revised version of its document entitled 'Revised ERG Common Position on the approach to Appropriate remedies in the new regulatory framework', ERG (06) 33, (the "Common Position on Remedies").

A4.38 That document sets out NRAs' views on imposing remedies in a manner that contributes to the development of the internal market and ensures a consistent application of the new regulatory framework under the EC Communications Directives.

A4.39 Ofcom has therefore taken into account those views in considering appropriate remedies.

Fixed Call Termination

A4.40 One of the markets where we are proposing a Charge Control is the call termination market.

A4.41 The European Commission has adopted Recommendation on the regulatory treatment of fixed and mobile termination rates in the EU.

A4.42 This guidance seeks to harmonize the approach by NRAs to the setting of price controls in relation to the regulation of voice call termination rates. The Recommendation seeks to harmonise the approach by NRAs

A4.43 In setting the new NCCs we have taken utmost account of the Recommendation.

Annex 5

List of services to be included in the NCC

Call termination
Internal local exchange segment
External local exchange segment
Internal local exchange stick

Call origination
Internal local exchange segment PSTN + ISDN (excluding OA)
External local exchange segment PSTN + ISDN (excluding OA)
Local exchange stick
Local exchange stick (ISDN)
Internal local exchange segment (including OA)
External local exchange segment (including OA)
Internal local exchange segment ISDN (including OA)

Product Management, Policy and Planning (PPP)
Internal
External

Interconnection Services Basket
Customer-Sited Interconnect
- Line – connection
- Line – fixed rental
- Line – per km rental

Intra building circuits
- Connection
- Rental

In-span interconnection transmission link
Interconnection Extension Circuits
- Connection
- Rental – fixed
- Rental – per km

Re-arrangements

Annex 6

Glossary

This glossary contains definitions of terms used in this document. These definitions are for guidance only and have no legal standing.

BT: British Telecommunications plc.

Communications provider (CP): a person who provides an Electronic Communications Network or provides an Electronic Communications Service.

Carrier pre-selection (CPS): A facility enabling customers to choose their carrier for certain defined classes of call, by selecting the operator of choice in advance (and having a contract with the customer), without having to dial a routing prefix or follow any other different procedure to invoke such routing.

Communications Act 2003 ('the Act'): The Act of Parliament that established Ofcom, set out its duties, and the powers which Ofcom has to discharge those duties.

Digital: the binary coded representation of a waveform, as opposed to analogue, which is the direct representation of a waveform.

DLE (Digital Local Exchange): the telephone exchange to which customers are directly connected, often via a remote concentrator unit.

DLRIC (Distributed Long Run Incremental Costs): is the Long-Run Incremental Cost of an individual service (see definition below) with a contribution of intra-core common costs.

Exchange line: the telephone line that connects the customers' network terminating point to the local exchange.

FAC (Fully Allocated Costs): an accounting method for attributing all the costs of the company to defined activities such as products and services. Typically this method would follow the principle of cost causality.

Hull Area: the area defined as the 'Licensed Area' in the licence granted on 30 November 1987 by the Secretary of State under section 7 of the Telecommunications Act 1984 to Kingston upon Hull City Council and Kingston Communications (Hull) plc also known as KCOM.

Indirect Access: where a customer establishes a connection with a particular operator's network by dialling a short code to switch through the network on which his exchange line terminates. Such calls are usually billed by the Indirect Access operator.

Integrated Services Digital Network (ISDN): a network evolved from the digital PSTN which provides digital exchange lines to customers and 64kbps end to end digital connectivity between them. Two or more 64kbps connections can be combined to provide a higher speed connection, e.g. 128kbps.

Interconnection: the linking (whether directly or indirectly by physical or logical means, or by a combination of physical or logical means) of one Public Electronic Communications Network to another for the purpose of enabling the persons using one of them to be able:
(a) to communicate with users of the other one; or
(b) to make use of services provided by means of the other one (whether by the provider of that Network or by another person);

IP (internet Protocol): the packet data protocol used for routing and carriage of messages across the internet and similar networks.

IP network: a network that uses IP; for example the internet is a public IP network.

KCOM: Kingston Communications (Hull) PLC – telephone company which operates in the Hull area.

Leased lines (also known as private circuits): a permanently connected communications link between two premises dedicated to the customers' exclusive use.

LRIC (Long Run Incremental Costs): The costs caused by the provision of a defined increment of output, taking a long run perspective, assuming that some output is already produced. The 'long run' means the time horizon over which all costs (including capital investment) are variable.

Narrowband: A service or connection allowing only a limited amount of information to be conveyed, such as for basic voice telephony. This compares with broadband which allows a considerable amount of information to be conveyed. See also bandwidth.

NGN: Next Generation Network, also referred to as 21CN (21st Century Network).

NRAs: the body or bodies, legally distinct and functionally independent of the telecommunications organisations, charged by a Member State with the elaboration of, and supervision of compliance with, telecoms authorisations.

PPP: Product Management, Policy and Planning.

PSTN: Public Switched Telephone Network.

Remote concentrator: the part of the local exchange on which customers' exchange lines terminate. It is sometimes colocated with the main local exchange and sometimes located remotely from it.

Return on Capital Employed (ROCE): the ratio of accounting profit to capital employed. The measure of capital employed can be either Historic Cost Accounting (HCA) or Current Cost Accounting (CCA).

RPI: Retail Price Index.

SMP: The Significant Market Power test is set out in European case law, the new EU Communications Directives and the Commission's SMP Guidelines. It is used by the national regulatory authorities (NRA) such as Ofcom to identify those operators who must meet additional obligations under the Access Directive.

Standard service: an interconnection service which BT is required to provide.

Tandem exchange: A main exchange in BT's network which has the primary function of switching calls between other exchanges, rather than to and from customers' exchange lines.

Usage factors: expressions of network usage for the main conveyance components and show how often a component is used on average in the provision of services.