



Ofcom Consultation – Narrowband Market Review – Consultation on possible approaches to cost modelling for the Network Charge Control for the period 2013-16

BT Response 9 November 2012

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Executive Summary

We welcome the opportunity to comment on the NGN cost modelling approach Ofcom propose to take if it is necessary to set a new network charge control (NCC) when the current NCC expires on 30 September 2013. We recognise the complexities involved in building such a model and offer the following comments as constructive criticism to assist in this process.

TDM, IP and regulation

We note that Ofcom places some emphasis on its duty to take the utmost account of the 2009 EC Recommendation, as appears from paragraphs 2.12, 3.8-3.10 and 3.60 of the consultation document. However, it is to be remembered that the Recommendation does not extend so far as to suggest that the cost model should be NGN-based. Rather, it recommends only that it should be based on the “efficient technological choices available in the timeframe considered by the model”. While it goes on to recognise, in that context, that the core part of a fixed network “could” therefore “in principle” be NGN-based, it does not positively advise that national regulatory authorities should in fact adopt a NGN-based costs model. Whether or not the NRA should actually do so will depend firstly on whether or not an NGN is the efficient technological choice available in the timeframe considered by the model, and secondly (even to the extent that it is) whether or not, in the particular circumstances of the market concerned, there is good reason to depart from the Recommendation that the costs model should be based upon such choices. Furthermore, it is essential that Ofcom’s response to those issues should not infringe the fundamental principle that BT should have a reasonable opportunity to recover its efficiently incurred costs.

In the United Kingdom, for the foreseeable future, the efficient decision for an operator with a TDM network is likely to be to sustain it, rather than to replace it, to provide continuity of service for its voice customers.

Practical considerations of equipment availability may drive a new entrant to build an NGN, and to that extent we would agree that a suitably calibrated NGN model may be used to suggest charges for calls, but that does not mean the time is right to base regulation on a presumption that the efficient network is an NGN.

We believe that TDM and various IP networks will exist side by side for the foreseeable future. As Ofcom propose, the regulated rate for call origination and termination should be available from the Pol closest to the customer. In BT’s case this would be the DLE, a TDM interconnect. The conveyance and interconnection of traffic between Pol is already competitive, as Ofcom concluded in the 2009 NBMR, and IP to TDM conversion is available within this competitive market. Ofcom should not decide where Pols should be built or the functionality they must provide, but should allow the market to determine the most efficient way of interconnecting between heterogeneous and developing networks.

Pure LRIC

We are surprised that the pure LRIC model produces a termination charge of 0.008ppm for 2013/14 which is minute in comparison with the current 24hr rate of ~0.23ppm and much lower than anything suggested by modelling elsewhere in the EC. The model is remarkably insensitive to volume changes and this suggests that the design may not be as efficient as it should be and needs to be revisited along with the application of the decremental approach.

LRIC+

The LRIC+ model appears to show that a disproportionate amount of costs are recovered in the early years and in some cases costs appear to be recovered before they have been incurred. On this basis, Ofcom fails its own 'no retrospection test' that the model should not assume that it was possible to charge more in historic periods than envisaged under previous cost models used by the regulator. Therefore Ofcom needs to review how economic depreciation has been applied in their model.

It is of the utmost priority for BT that we have a fair opportunity for cost recovery. It is essential that the NGN model for the four hypothetical operators includes provision for the full range of voice services BT is currently expected to provide, taking account of its USO and status as the provider of last resort.

Question 1: Do you agree with our proposal that NGNs can be considered the MEA for the purposes of modelling call origination and call termination services? If not, please explain why.

1.1 We note that Ofcom places some emphasis on its duty to take the utmost account of the 2009 EC Recommendation, as appears from paragraphs 2.12, 3.8-3.10 and 3.60 of the consultation document. However, it is to be remembered that the Recommendation does not extend so far as to suggest that the cost model should be NGN-based. Rather, it recommends only that it should be based on the “efficient technological choices available in the timeframe considered by the model”. While it goes on to recognise, in that context, that the core part of a fixed network “could” therefore “in principle” be NGN-based, it does not positively advise that national regulatory authorities should in fact adopt a NGN-based costs model. Whether or not the NRA should actually do so will depend firstly on whether or not an NGN is the efficient technological choice available in the timeframe considered by the model, and secondly (even to the extent that it is) whether or not, in the particular circumstances of the market concerned, there is good reason to depart from the Recommendation that the costs model should be based upon such choices. Furthermore, it is essential that Ofcom’s response to those issues should not infringe the fundamental principle that BT should have a reasonable opportunity to recover its efficiently incurred costs.

1.2 Whilst we agree that a new entrant may be compelled to build a voice network using IP elements, as TDM switches are no longer available, we do not agree that leads to a conclusion that the time is right to base regulation on a presumption that the efficient network is an NGN.

1.3 While other operators have built NGNs of some size in the UK, the primary focus of these networks has been the provision of Broadband services. The growth of these operators on NGNs has been based on Broadband and the provision of bundled products with combinations of Voice, Broadband and Entertainment. This is substantially different from competing directly in the nationwide PSTN market and allows Broadband operators to grow with a network of restricted geographical reach and narrow functionality. Customers who are expensive to serve or with requirements that cannot be satisfied by the NGN can be left to remain on TDM networks, and indeed contracted out to BT as the provider of last resort. There are no NGNs that provide a full range of services nationwide, and we are not aware of any such deployments anywhere in the world at the moment.

1.4 Ofcom state their preference is to base costs and asset values on the most efficient available technology that performs the same function as the current technology. BT has been in the forefront of the move to NGN with its 21CN network and has completed extensive design and customer trials over the last 6 years. This experience has led us to conclude that investment in the refurbishment of our TDM fabric is preferable to the migration of our voice customers onto our NGN. This is the most cost effective method of providing continuity of service to our customers, and we would expect any operator with extensive TDM assets to be in a similar position.

1.5 Practical considerations of equipment availability may drive a new entrant to build an NGN, and to that extent we would agree that a suitably calibrated NGN model, may be used to suggest charges for calls but that does not mean an NGN can be assumed to be the only efficient network for the provision of a voice service.

1.6 The extremely protracted movement of voice services from TDM to NGN may also suggest that the future efficient network for fixed voice may be very different from current designs current designs of NGN. The rollout of fibre and growth of VoIP services could mean that a single ‘MEA’ network for voice is never established and regulation should be flexible enough to accommodate diverse designs that are efficient for the operators but are very different from one another.

Question 2: Do you agree with our proposal that our NGN model should include Pols based on IP interconnection? If not, please explain why.

2.1 As we have explained in our response to Question 1, the efficient network for the UK will be based on a mixture of TDM and IP technology for the foreseeable future. Therefore efficient interconnect will be a mixture of IP-IP, TDM-TDM and IP-TDM interworking. Ofcom recognise this reality at para 3.74 in their consultation. BT, as a TDM operator, will continue to provide TDM interconnect where the relevant Pol will be at the DLE where the charge Ofcom determine will apply. This charge should reflect the efficiently incurred costs of interconnect rather than a hypothetical construct where interconnect is exclusively IP-IP. Were BT to be required to offer IP interconnect from 20 Pols, this would offer a perverse incentive for CPs to convert TDM traffic to IP which BT would then have to convert back to TDM to deliver to TDM lines. Not only would this be inefficient, but there would be a significantly adverse effect on quality.

Question 3: Do you agree with our proposal on 20 Pols for our NGN model? If not, please explain why.

3.1 Our view remains that it is not clear at this stage what the most appropriate interconnect arrangement will be in the future and that these arrangements should be allowed to evolve in relation to market requirements and technological developments. Whilst we recognise that it is necessary to make an assumption about the number of Pols for the purpose of building a hypothetical model, BT has not moved to an NGN voice network and has no IP Interconnects. In the absence of any actual deployment, it would be disproportionate for Ofcom to intervene by dictating how interconnect takes place, thereby distorting the more efficient investment decisions which might otherwise be taken. In the IP world there is no requirement for signalling and media to be handed over at the same location. Call control can be concentrated at a much smaller number of locations than may be efficient for media exchange. This opens up many permutations of which 20 Pols is just one. The application of charges should continue to reflect the market boundary i.e. the point nearest the end user where signals can be exchanged.

3.2 In a world where Interconnect is deemed to take place at 20 Pols, we would expect TDM interconnect to be deregulated, as proposed in Italy, as it would no longer be the efficient interconnect as defined by Ofcom.

Question 4: Do you consider that if the MEA is NGN, the costs of conversion from TDM to IP should be excluded from cost-based call origination and call termination rates? If not, please explain why.

4.1 As we have previously explained, we do not agree that an NGN is the MEA. Each network should be allowed to develop in a way that provides the lowest cost PSTN service for their customers. As Ofcom propose, the regulated rate for call origination and termination would be available from the Pol closest to the customer. In BT's case this would be the DLE, a TDM interconnect. The conveyance and interconnection of traffic between Pol is already competitive, as Ofcom concluded in the 2009 NBMR. IP to TDM conversion is available within this competitive market. Ofcom should not decide the location and translation but allow the market to determine the most efficient way of interconnecting between heterogeneous and developing networks.

Question 5: Should we use a bottom-up modelling approach for calculating the efficient costs of call termination and call origination? If not, please explain why.

5.1 As Ofcom states at para 4.9, bottom up modelling can be complex, and the extent to which network assets are shared with other services is often difficult to identify, and will be highly sensitive to volume forecasts and how costs are allocated between the services. This makes any cost estimate crucially dependent on the accuracy of volume forecasts, not only of the voice services, but also of broadband and other services sharing any infrastructure. However, the absence of an existing NGN network with national coverage for the full range of voice services, limits the possibility of developing a top down NGN model.

5.2 The bottom up model should reflect the network choices new entrants are likely to make and use Openreach EOI costs where appropriate.

5.3 Therefore BT strongly supports Ofcom's proposals to verify the cost model outputs and cost recovery. In particular, this will require a top-down fully allocated cost model which looks at the alternative option of keeping a TDM network running over the charge control period. This will necessarily require provision for the additional costs and risks associated with sustaining a TDM network as an alternative to investment in an NGN voice network

Question 6: Do you agree that we should use a decremental approach when calculating the pure LRIC of call termination? If not, please explain why.

6.1 We agree in principle that a decremental approach should be used when calculating the pure LRIC of call termination. However, we have noticed that the Ofcom model is relatively insensitive to volume changes. As a consequence the 2013/14 call termination charge output from a Pure LRIC run or the model is 0.008ppm which is minute in comparison with the current 24hr rate of ~0.23ppm and much lower than anything suggested by modelling elsewhere in the EC. This could be because the design used in the model is not as optimal as it could be and therefore service specific costs do not vary as much as they should do in relation to traffic volumes. The design and the application of the decremental approach both need to be revisited.

Question 7: Do you agree with our approach to network cost verification? If not, please explain why.

7.1 BT strongly supports the 3 conditions Ofcom propose must be met by the modelling that are outlined at para 4.14 namely

- **No increase in costs compared to an anchor pricing approach based on a hypothetical ongoing TDM network:** Specifically, the NGN unit costs are no higher over the 2013-2016 period, than if based on a hypothetical ongoing TDM network (i.e. based on the modelling approach of the 2009 NCC);
- **No retrospection:** The path of unit costs from the NGN does not depend on an assumption that it was possible to charge more in historic periods than envisaged under previous cost models used by the regulator; and
- **Fair opportunity for cost recovery:** The unit costs from the NGN model over the 2013-16 period would not deny BT the opportunity to recover its efficiently incurred costs (in particular those of TDM assets).

7.2 It is of the utmost priority for BT that we have a fair opportunity for cost recovery, and therefore it is essential that the NGN model for the four hypothetical operators includes provision for the full range of voice services BT is currently expected to provide, taking account of its USO and status as the provider of last resort. By definition, this must include the cost of rolling out a national network with full geographic coverage. Provision must be made to give continuity of service to end users including such services as ISDN30. Under the current regulatory model, provision must be made for CPS and IA assuming Ofcom continue to impose these obligations. We also notice that no provision appears to have been made in the model for the intelligent network (IN). Provision does not appear to have been made for the development costs of the full range of voice services on the call server which we estimate to be of the order of £50m.

7.3 Regarding the other comparisons Ofcom proposes against existing sub-national NGNs and other NRA NGN models some care will need to be taken to ensure due account is taken of differences:

- Figures from network operators need to be treated with caution, as it is vital that cost comparison be made on a like for like basis. For example there are very significant costs attributable to resilience and quality of service, which may distort any simple cost comparisons.
- Frequently, the purchase cost of hardware is only a small part of the overall cost of investing in a network. There are installation and commissioning costs. In some operators these costs may be treated as current costs, whilst others may capitalise this as labour costs.
- There are often significant software costs incurred in building a network that is operationally capable of delivering voice services. These may include software license costs whose recovery may vary depending on the purchase contract. (These could be incorporated into the hardware costs or charged on an annual basis, or recovered on the basis of end-users or on volume throughput.) Care is needed to ensure these any cost comparisons are treating like with like.
- Operating Support Systems costs also need to be included. There is no one technical model for a NGN, and a significant investment in software is needed to ensure that multiple systems are compatible. Operators that just “cherry-pick” an individual service may be able to avoid these costs hence the need to assume that all 4 operators provide the full range of voice services

Question 8: Do you agree with our proposed approach to traffic forecasting and the modelled market share? If not, please explain.

8.1 Our response to this question should be read in conjunction with the attached report produced by Deloitte: ‘Volume forecasts in Ofcom’s proposed NGN model’.

8.2 The volume trends developed by Ofcom for the model are counterintuitive:

- The lines forecast is U shaped when the expectation is that they will gradually decline
- Total minutes of use start to grow whereas a continued gradual decline is expected
- Broadband household penetration approaches 85% which is not supported by any other source

- The growth rate in broadband b/w is shown as increasing whereas the growth rate is expected to decline
- Broadband volumes over fibre need to be excluded from the model because they use different network elements
- Broadband usage over fibre needs to be excluded from the usage figure used in the model and excluded from the backhaul requirements.

8.3 Ofcom's forecasts are not based on the latest information available to them in their own reports and the assumptions made regarding dampening and trending have not been justified. The forecasts need to be revisited and we would make the following specific observations in the paragraphs below.

8.4 The model only includes actual data to the 2010/11 financial year. Data is now available for 2011/12 and actual data for this year should be used and forecasts made for 2012/13 onwards.

8.5 The model uses only 3 years of historical data to establish a volume trend. There is no justification given for ignoring earlier years' data. Unless there are good reasons, all the historical data should be used to forecast future growth rates.

8.6 The use of a volume dampening factor is unjustified. This has a significant effect as it the dampening factor is compounded every three years. This has the result that eventually volumes become "flat" in the model. BT suggests that the model uses no dampening factor, or if one is to be applied, it should not result in a compounding of the dampening.

8.7 The model makes little attempt to link volume forecast with changes happening in the market-place. This is especially true given the potential impact of 4G mobile phones offering high bandwidth broadband which could substitute for fixed broadband. Fibre based broadband will also grow substantially over the period. Already BT has passed more than 12 million premises and has more than 950,000 fibre customers connected¹. This will reduce the volume of copper based broadband users and will act as a brake on the growth in average bandwidth per user as users with very high bandwidth demand chose to take the fibre broadband product.

8.8 A large number of households have no fixed line at present, using mobile only. The proportion of households with fixed lines has been declining gradually over recent years from 87% in 2009 to 84% in 2012². This can be expected to decline further and will limit the potential market size for fixed broadband, whereas Ofcom's forecasts imply that a maximum broadband penetration of households of 84.5% is reached. This needs to be reviewed because maximum broadband penetration should be recalculated to reflect historic growth rates and analyst prediction, and be no higher than 82%.

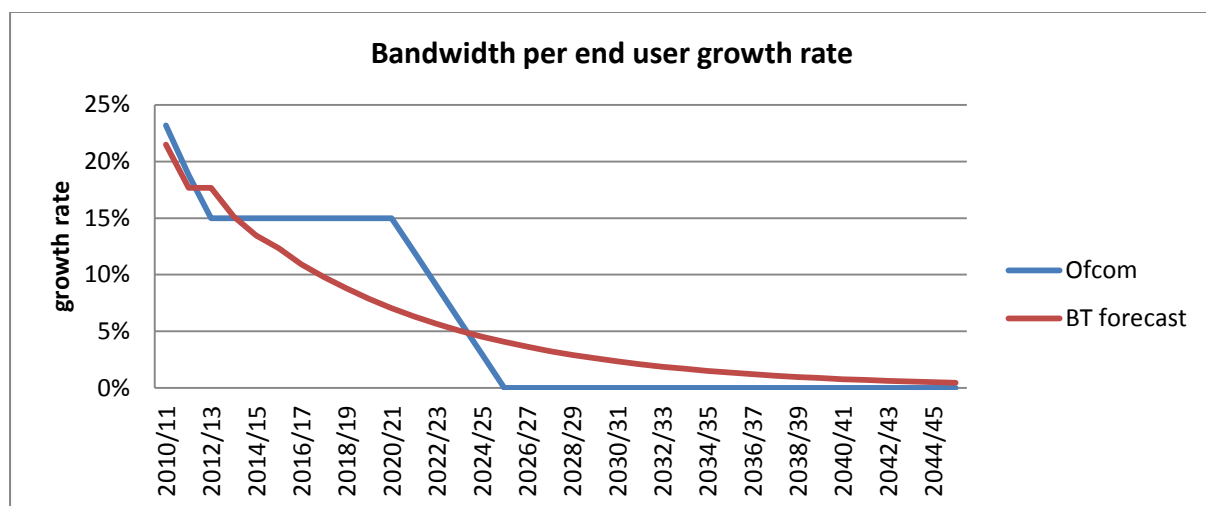
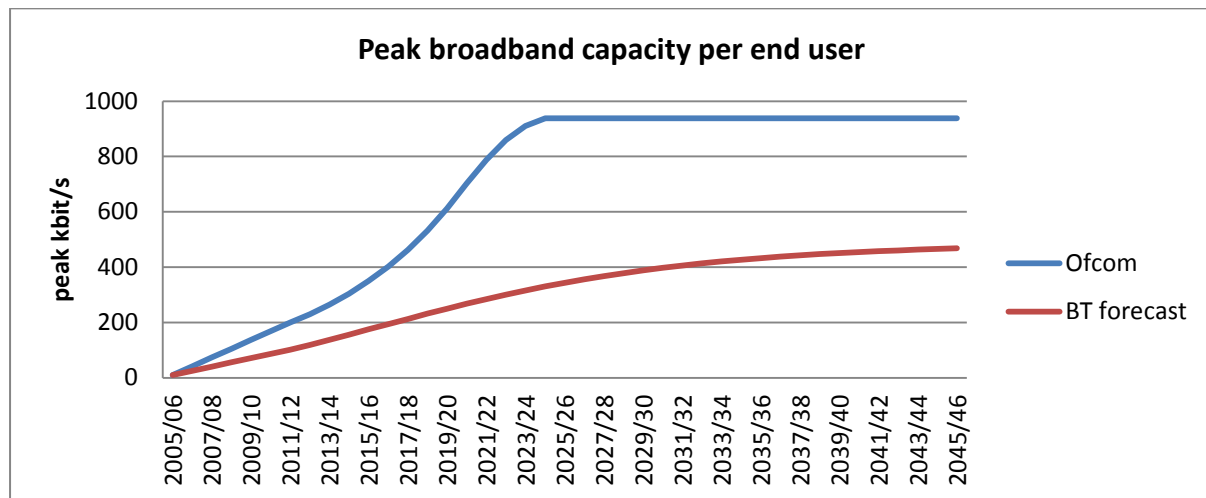
8.9 Ofcom's model makes the following assumptions about peak bandwidth usage which is well in excess of the actual bandwidths BT submitted in response to a S123 on 11 September 2012:

Peak average bandwidth per line kb/s	2010/11	2011/12	2012/13	2013/14
Ofcom's demand file	168	200	230	264.5

¹ See BT Q2 2012/13 results presentation, slide 15

² See Figure 5.56, The Communications Market 2012, Ofcom

8.10 BT agrees with Ofcom that the broadband bandwidth growth rates will decline over time but believes that a smoother profile is more likely. We have reforecast volumes and the results are shown in the two graphs below: a volume per end user chart and a growth chart.



8.11 The growth in fibre based broadband can be expected to be considerable over the forecast period. This will reduce volumes on the copper based broadband platform. This migration should be taken into account by excluding the fibre volumes from the volume forecasts. Correspondingly usage on fibre lines should be excluded from the averages used in the model which only uses copper

8.12 Non-geographic voice calls appear to have been omitted from the volume forecast. Many of these calls are to Number Translation Services, where a second geographic call is made following the number translation, which will then require a call termination in the usual way.

8.13 The volume of non-geographic voice calls appears in the traffic input sheet but does not appear to be carried forward in the traffic demand sheet. There is also an understatement of the non-geographic call volumes as the model does not appear to include both business and residential non-geographic calls.

8.14 The 25% market share assumption will mean that around three-quarters of all calls will be terminated on a different network. A much higher proportion of calls will therefore interconnect between networks than is shown in the Ofcom model. This will also increase call termination volumes.

8.15 The model does not appear to identify calls from mobile networks terminating on fixed networks. Ofcom market information³ shows in 2011 a volume of 31bn minutes from mobile networks to fixed networks compared with 10bn minutes of calls from fixed to mobile. This imbalance between outgoing calls and incoming calls has not been recognised in the volume modelling

Question 9: Do you agree with our approach to non-network costs and passive network elements? If not, please explain.

9.1 If BT were to build an NGN voice network, it would rely upon services purchased from Openreach on an EoI basis, as would competing operators entering the market. Any model of NGN voice should therefore include the price of these elements. The price includes the cost of duct and transmission so there is no need for Ofcom to model these separately.

9.2 Where elements not covered by Openreach services are needed, such as Land and Buildings, power, vent and chilling costs, business rates etc. it would be appropriate to take BT's costs as a proxy.

9.3 It is also important to incorporate the operating costs of providing an adequate customer service support, such as order-taking and fault reporting. These costs can be substantial but are frequently overlooked in bottom-up cost builds that focus on network infrastructure.

PPP costs

9.4 PPP costs relate to Product Management, Policy and Planning costs. It has been argued by Ofcom that these costs are not volume sensitive, and therefore should not feature in the LRIC of call termination. However, these costs are driven by the existence of the voice TDM interconnect products themselves. Part of the PPP costs relate to the existence of call termination products and therefore should be included within the LRIC of call termination. For example:

- product management activity relating to call termination;
- volume measurement systems;
- call routing tables (showing where calls to individual numbers must be delivered);
- tariff-setting systems (e.g. the call termination element of the Element Based Costing matrix);
- pricing and billing of call termination products.

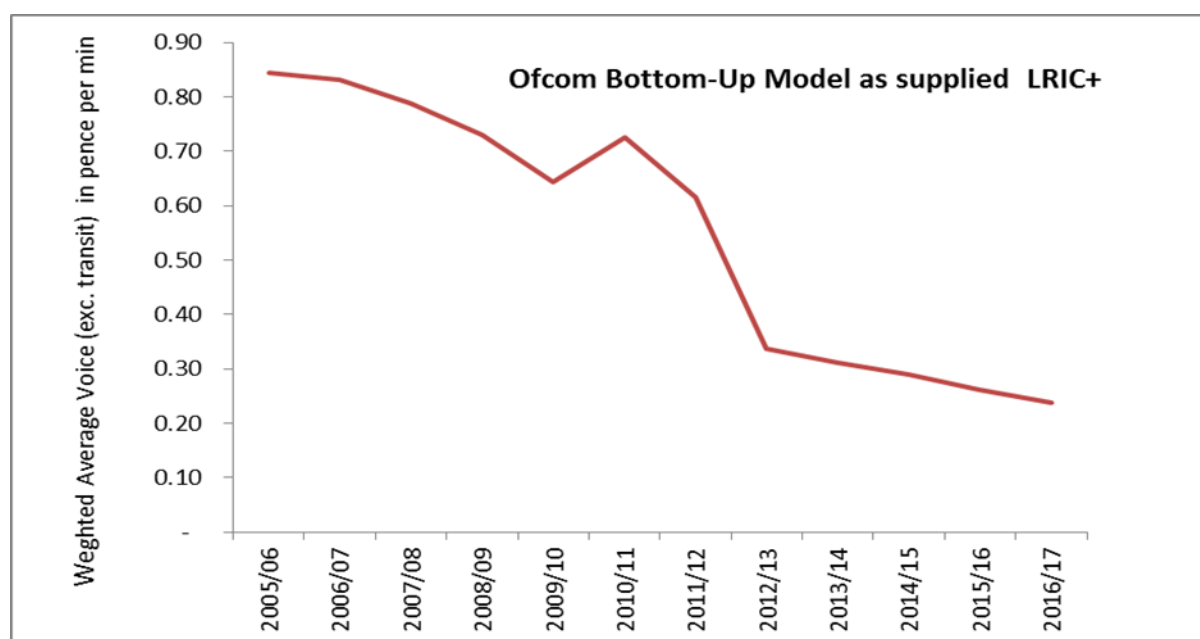
9.5 All these PPP activities will incur incremental cost as a result of the call termination product and so should be included within the LRIC of call termination even though they do not vary with volume. These costs can be considered to be "increment specific fixed costs", meaning that these are volume invariant costs that nevertheless need to be incurred as a consequence of the provision of call termination services and therefore should be included within call termination costs.

³ See Figures 5.29 and 5.37, The Communications Market 2012, Ofcom

Question 10: Do you agree with our proposed approach to cost recovery? If not, please explain why.

10.1 We note the EC Recommendation and Ofcom's view that Original ED mimics a hypothetical competitive market by matching the cost of equipment to its actual and forecast usage over the long term. Consequently, there is relatively little depreciation in years when utilisation is low and relatively high depreciation in years of full, or almost full, equipment utilisation.

10.2 In our view, unit cost calculated from the model is not consistent with this explanation and is in breach of Ofcom's constraint of no retrospection⁴



This unexpected outcome may be due to a number of factors.

Matching depreciation and utilisation

10.3 Economic depreciation should spread the cost of an asset over the economic benefit derived from using the asset. For a single investment, the cost would be depreciated over the economic lifetime of the asset, and spread over the output produced during the asset's lifetime.

10.4 However, the economic depreciation model has the unexpected effect of applying depreciation for some assets to output that has occurred prior to the investment being made. In other words, the cost of an asset has been applied to past periods before the asset is brought into use. This is contrary to the purpose of depreciation, which is to spread the cost of an asset over services produced using the asset over its useful economic life.

10.5 It is likely that this effect is due to the simplifying assumption of treating all investment in each asset class as a homogeneous investment and performing a single economic depreciation calculation using the NPV of all investment made in the asset class. This distorts the model given the varying outputs in different years in the model, and in practice a more granular treatment is required to ensure each asset is properly matched in cost terms to the output produced using the asset.

⁴ Ofcom Narrowband Market Review Consultation on possible approaches to cost modelling for the Network Charge Control for the period 2013-16 paragraph 4.17

Discount rate assumption

10.6 Ofcom has modelled a hypothetical investment in an IP- based network based on a hypothetical operator with a 25% market share. It is therefore questionable whether the discount rate should be based on BT's cost of capital. As the investment is hypothetical and has not actually taken place, BT's historical WACC is neither relevant nor appropriate for cost modelling.

10.7 The appropriate cost of capital to use is the forward-looking financing costs the hypothetical 25% operator will face in making the investment in the 21CN network. It is clear that this WACC will differ from BT's cost of capital. In particular, debt finance is likely to be more difficult to raise compared with BT because a smaller operator is likely to have a lower credit rating. This would lead to a higher cost of debt and it is also likely the gearing ratio would be lower leading to a higher proportion of the business supported by equity. Both these factors raise the cost of capital in comparison with BT, meaning that a real-terms WACC of closer to 8% should be used *throughout* the cost modelling.

Ofcom's WACC Calculations

10.8 BT is also concerned that Ofcom appears to have converted past nominal WACC figures into real terms using a forecast inflation rate. In practice, these values should be derived using the actual inflation rate experienced in the past. This would give the following values for BT's historic WACC expressed in real terms. It is apparent that the Ofcom's model uses an implicit RPI assumption of 2.5%, a much lower figure than the inflation actually experienced over this period.

10.9 The attached table shows BT's historical WACC figures adjusted for the actual inflation experienced. This shows that Ofcom's model should have reduced the past WACC from an average of 8.5% to 7.6% if the discount rate is to be based on BT's real terms WACC. The rapidly changing "real-terms" BT WACC causes considerable distortion to the Economic Depreciation calculations so it is recommended that a stable "hypothetical" cost of capital is used to ensure a more reliable result is achieved from the modelling.

Conversion of WACC from nominal to real-terms

	2005/6	2006/7	2007/8	2008/9	2009/10	2010/11	2011/12	2012/13 onwards
BT WACC - Nominal pre-tax	12.3%	11.4%	11.4%	11.4%	11.0%	11.0%	9.7%	9.7%
ONS calendar year average RPI (12 months)	2.8%	3.2%	4.3%	4.0%	-0.5%	4.6%	5.2%	3.0%
BT WACC - Real Terms	9.2%	7.9%	6.8%	7.1%	11.6%	6.1%	4.3%	6.5%
Ofcom Model - Real Terms WACC	8.70%	8.70%	8.70%	8.70%	8.30%	8.30%	8.30%	6.50%
Difference	-0.5%	0.8%	1.9%	1.6%	-3.3%	2.2%	4.0%	0.0%
Recommended rate	8.0%	8.0%	8.0%	8.0%	8.0%	8.0%	8.0%	8.0%

Operating Expenditure

10.10 Operating costs are incurred each year and the cost should be matched with the year in which the expenditure is incurred. There is no reason to apply an Economic Depreciation approach to operating costs, nor is any justification for this approach given.

Cost of Capital

10.11 The model does not appear to include a return on capital employed or if it does we have been unable to find it. This is a significant element of the total cost base and should be included in the cost modelling.

Duration of model

10.12 The time horizon for the analysis appears to be extremely long (over forty years), beyond any reasonable expectation of accurate forecasts. The volume forecast for broadband, both in terms of end-users taking copper based broadband services, and the volume per end user are both subject to high levels of uncertainty. This could adversely affect the cost allocation. The time horizon should therefore be limited to a maximum of 25 years into the future. Indeed over the time horizon other costs need to be incorporated as there will be a need to replace fibre costs as the existing assets will reach the end of the operating lives well before the end of this time horizon.

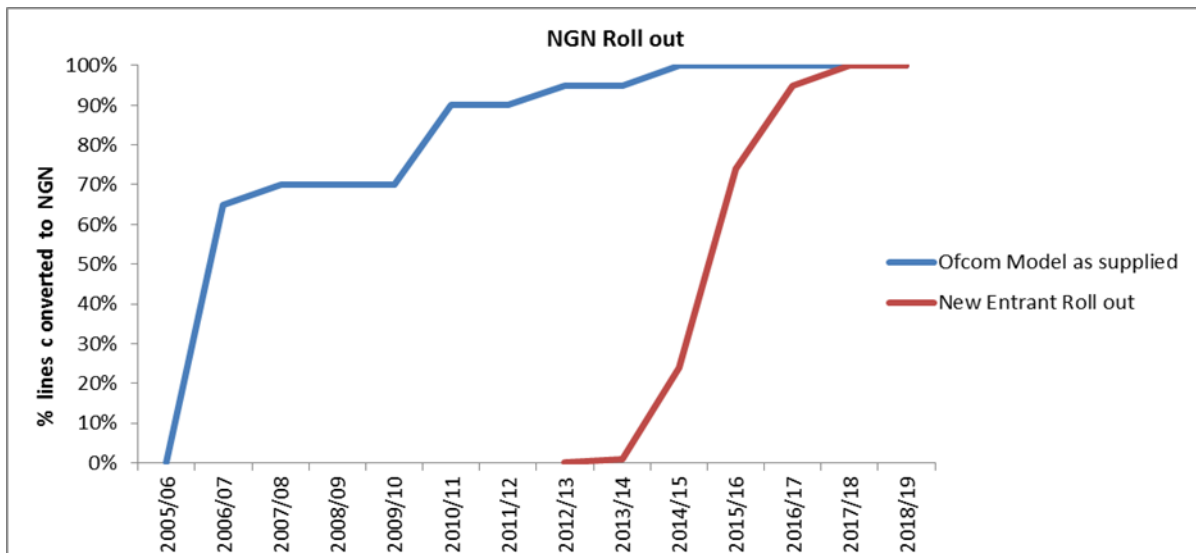
Start date of model

10.13 All the models being developed in other European countries, and indeed the cost model for mobile termination rates in the UK, use costs which bear some relationship to what has already been deployed. No operator has, as yet, deployed a NGN network with national coverage that can provide the full range of voice services. In the case of the NCC, Ofcom concluded in 2009 that an NGN was not the MEA. It would be consistent with this conclusion if the hypothetical NGN commenced at the start of the next review period.

10.14 Should the model attempt to represent a build initiated in earlier years, the design would have to be modified to include only equipment which was available at the time. Some elements in the proposed model are only becoming available at the current time and a different design would be needed for prior periods. Ethernet technology with synch e has only been available for a couple of years, and in the Core, 100GE is only just starting to be used by operators, but not yet by BT. Neither were available in 2005/6 as shown in the model, and therefore other technologies must be used

Roll out period

10.15 The Ofcom model assumes 62% of users are acquired by the NGN operator in the first year, with the remainder acquired over 10 years. We believe this is unrealistic and that a normal distribution acquiring 25% market share over 5 years would be more appropriate for a new entrant, or for that matter a TDM operator migrating to NGN. This was the plan for mass migration in BT's 21CN.



Glossary of terms

21CN	21 st Century Network
CP	Communications Provider
DLE	Digital Local Exchange
EC	European Commission
ED	Economics depreciation
EOI	Equivalence of Input
EU	European Union
IN	Intelligent network
IP	Internet Protocol
ISDN	Integrated Services Digital Network
LRIC	Long Run Incremental Cost
MEA	Modern Equivalent Asset
NBMR	Narrowband Market Review
NCC	Network Charge Control
NGN	Next Generation Network
NRA	National Regulatory Authority
NTS	Number Translation Services
POI	Point of Interconnect
PPP	Product Management, Policy and Planning
PSTN	Public Switched Telephony Network
TDM	Time Division Multiplexing
USO	Universal Service Obligation
WACC	Weighted average cost of capital

END