

Vodafone's response to Ofcom's narrowband market review consultation on possible approaches to cost modelling September 2012.

Executive summary

Vodafone welcomes the opportunity to respond to this consultation. Vodafone supports Ofcom's initiative to develop a model of a fixed telecommunications operator on a basis that is, in its overall design principles, broadly consistent with the model that has been deployed in the regulation of mobile termination rates. Although mobile termination and fixed termination are clearly separate markets, both are within the scope of the EC 2009 recommendation on termination and both should have a similar methodological underpinning – since Ofcom has already taken the decision that MTR is to be regulated in the UK as the last increment under pure LRIC, it is imperative that fixed termination regulation follows a similar costing basis without delay.

We accept that this preliminary version is merely a first step on the journey to the production of a reliable and robust model that is fit for the purpose of providing the costs of fixed origination and termination for regulatory charge controls and that considerable further work is still necessary. Vodafone understands that to a considerable extent many model input values and assumptions are early estimates, given that the Section 135 information process to collect operator specific values on network dimensioning rules, costs etc. post-dates the production of the current version.

Therefore whilst it is to be expected that the pure LRIC of termination output by the final version of the model will be considerably below both the current charge control level and the LRIC+ of termination of the same model, it is not clear how far apart from the final version any of the outputs of the current model might be. Vodafone has spent no time therefore at this stage in considering the actual outputs of the model, but rather focussed attention where it might prove most useful to Ofcom, on the overall design and methodology of the model, particularly in the light of Vodafone's considerable experience with the mobile termination LRIC+/LRIC model.

Our brief review of this first version of the fixed model suggests that there are some areas where there is particular need for further work before Ofcom issues the "pre-final" version of the model (that will accompany the next consultation document) which will need to have representative inputs and produce meaningful outputs. It is this "pre-final" version on which most scrutiny by stakeholders will necessarily be made for the evaluation of fitness for purpose – it is important therefore as part of the overall market review process that the pre-final version is as complete, reliable, and usable as possible. It might assist the process if a further iteration of the model is issued before the "pre-final" version – this could be done in advance of the next formal consultation.

There has been insufficient time in the brief consultation period allowed to examine the model thoroughly at a great level of detail, so any conclusions we express here must be considered to be provisional and partial in nature. It has been possible to establish that there are at this stage a series of obvious issues that require resolution, in relation to the proper understanding of the dimensioning rules in the model, the implementation of NGN, peak and annual traffic dimensioning and cost recovery, traffic and service modelling, construction of the pure LRIC and LRIC+ outcomes, and others. We provide our current suggestions for model amendment and development in the paragraphs below.

Proper understanding of the dimensioning rules applied to in the model

The EC 2009 recommendation on termination, and its implementation with respect to mobile termination by Ofcom, subsequently modified on appeal by the CC and the CAT¹, means that from 1st April 2013 the termination rate charged by the mobile operators will be directly reflective of the underlying modelled pure LRIC of termination: further the mobile termination rate has been below the modelled mobile LRIC+ rate since May 2012. This is not the case with the current charge control on the fixed operators with respect to the fixed termination rate, which is currently based on a method that allows recovery of fixed and common costs, and is thus equivalent to a LRIC+ basis. In order to be consistent with the mobile approach, and to eliminate the cross-subsidy between mobile and fixed that results from inconsistent methodologies, the fixed termination rate needs to be reset without delay to one derived from a pure LRIC approach, as recommended by the EC. We therefore support the need to develop a model that is capable of generating a pure LRIC cost for fixed operators for implementation by 1st October 2013.

As was made clear in the debate on the mobile modelling process, the most important consideration in the development of a model that is capable of producing a pure LRIC output is that the model can correctly identify those assets (by category and quantity) that are incremental to the termination service, when termination is considered as the last incremental service. In order to do this, the fixed model follows the simple principle suggested by the EC and employed in the UK mobile model and in other models internationally, of contrasting the equipment build required when all services are modelled with the build required when all services except termination are modelled – by subtraction, the difference in the network build in these two scenarios becomes the incremental build for the last service. The cost of this network increment can then be calculated and recovered against volumes using well established economic depreciation principles.

But this must not be a mere mechanical exercise – it is clear that the fixed model is currently capable of calculating something, but in order for the model to be fit for purpose it must be calculating the *correct* volumes and costs on an asset by asset basis. It was a major part of the mobile termination appeal in 2011/12 that the mobile model did not correctly or reasonably identify the assets that were incremental to termination on this subtractional basis. In order to eliminate a similar

¹ In particular as a result of an appeal by BT that the mobile rate should be brought down to pure LRIC in line with the EC's timetable

uncertainty arising with respect to the fixed model, it must be established as soon as possible to the satisfaction of stakeholders whether the model is in fact capable of identifying the asset elements (and the relevant quantity of each such asset) that are incremental to the modelled volume of the regulated element of the fixed termination service, when this is considered as the last increment. This exercise must form a crucial component of any fitness for purpose evaluation of the “pre-final” version of the model. Given the importance of clarity on this point it seems to Vodafone that there are a number of steps that Ofcom can undertake at this stage to improve the functioning of the model for the pure LRIC calculation.

But obtaining a reliable pure LRIC output for regulated termination is not the only purpose of the fixed model, since it also has to be able to provide in a robust manner the costs of the fixed origination service², most likely on a LRIC+ basis. In order to satisfy this additional requirement, the model must also be able to reliably identify the proportion of network resources that are expended on fixed origination (as well as those resources expended on all other fixed services) and correctly allocate costs to each service on a LRIC+ basis using, as in the mobile model, an EPMU allocation of all relevant resources in order to provide an implicit EPMU fixed and common cost mark-up.

To enable stakeholders to believe that the model is satisfactorily performing these two tasks, it is necessary for the dimensioning rules that the model is using to be thoroughly tested and evaluated. At present however the dimensioning rules that are being applied to individually modelled asset elements are somewhat convoluted and obscured in the model, so that it is very difficult to understand the modelled relationship for individual asset elements between traffic volumes and dimensioning rules – without this understanding it is difficult to form an opinion as to whether the model is in fact correctly calculating volumes and costs by service, particularly for LRIC but also for LRIC+. We suggest two principal improvements to the model and to its documentation:

- In the first place it would appear that individual nodes have been modelled at a level of too much complexity, down to card level in most cases. This is a level of detail considerably greater than that employed in the mobile model, and greatly adds to the difficulty of comprehension and evaluation of dimensioning rules. Furthermore, the disaggregation forces a knowledge of unit input costs at a much more detailed level than is necessary or straightforward to accomplish (particularly where these individual elements are not being purchased separately but as part of a coherent whole (of a complete node). The purchase cost of such disaggregated elements when purchased individually may be both difficult to discern and be higher than when nodes are purchased as single units rather than as a kit of parts.

However it would appear from the consistent use of the same element output calculation across multiple asset elements in each node, that some of these separately modelled elements co-vary in dimensioning and are recovered across services identically or at least proportionately. This suggests that the model could be readily simplified by collapsing some of these modelled asset

² Assuming that this too is to be regulated

elements into fewer and larger sub-units, so that there are fewer asset elements modelled per node. This would considerably aid understanding by stakeholders of the network dimensioning rules applied in the model as well reduce some of the difficulties of obtaining representative unit costs for the nodes as a whole.

- Secondly, in order to prove that the model is deriving the correct volume of asset elements required by the last increment, as well as by all other services, as a response to the modelled traffic volumes per service, Vodafone suggests that Ofcom generates a document to accompany the model that explains in some detail, on a node by node basis, the interrelationship between traffic volumes and network dimensioning, focussing in particular on the last increment and how this has been reflected in the model. This document could be used to test the dimensioning logic of the model and thus develop an understanding of how reliable the model is in its prediction, on an asset element by asset element basis, of whether additional units of each network element really are required to service the last increment of regulated termination (given the modelled quantity of that element that is already required to accommodate the traffic volumes in that year of all other services). In addition, it would facilitate the forming of a view as to whether on a LRIC+ basis the model is correctly deriving the weight of resource used by each service (on an asset by asset basis) and thus is properly allocating costs between services.

We agree with Ofcom's decision that neither the "passive assets" nor the non-network costs should be considered incremental to the last increment of regulated termination. This is entirely consistent with the approach adopted for mobile termination.

Adoption of NGN as the basis for modelling the hypothetical operator

Vodafone also broadly supports Ofcom's decision, in the circumstances, to develop the fixed model using an NGN design. This obviously however brings its own unavoidable issues:

- Unlike the mobile model, the possibility of full top-down calibration against operator actual values becomes impossible. This increases the need for the bottom-up prices used in the model to be representative of the costs that would be experienced in the event that the hypothetical 25% regulated operator were to have constructed a NGN solution. In part the risk of using non-representative costs can be reduced by not disaggregating the dimensioning of nodes into so many different asset elements, as described above – it is more likely to be expected that reliable node prices can be obtained at the level of the total node rather than at the individual card level.

The absence of full top-down calibration must increase the need for Ofcom to make use of as many cross-checks and calibrations as are possible, e.g. are the total numbers of nodes sensible, is the total cost of a single assembled node realistic, how reasonable is the overall capex total, is the overall

capex/opex ratio likely to be representative of a modern efficient network, and so forth.

- More network design assumptions become uncertain, for example the voice codec to be adopted on a long-run basis. This is not an insignificant variable, since the kbps of the codec adopted bears a direct relationship to the volume of the peak termination traffic at the interconnect nodes, and hence to the cost of termination for these nodes. At the moment the adopted codec is a high rate of 135kbps³ which is modelled as a constant in all years. Given the expectation that a lower bit rate codec will be adopted as a long term outcome to increase network efficiency, it may be more reasonable to model the voice codec in use as a declining variable across time, rather than a constant. This is a simple modelling adjustment.
- A similar consideration applies to the proportion of interconnecting traffic that is assumed to be TDM. The model currently assumes that 40% of all interconnecting traffic will remain TDM in perpetuity. This is counter-intuitive – it may be more reasonable to match the interconnecting TDM proportion to the proportion of the modelled operator's traffic that is on TDM, i.e. a percentage that falls to 0% once it can be assumed that all efficient fixed operators have adopted NGN.
- There is a broader issue in this in that since in the real world BT has chosen not to implement NGN to date, all that which would have had to have happened in this eventuality has not actually happened. For example NGN standards are not established with respect to the voice codec, the number of points of interconnect is still a matter of debate, and the unit costs of NGN equipment have not dropped in the UK to the levels they would have in the hypothetical world of BT NGN adoption that would have driven extensive NGN investment over the past few years. Many of the network design and cost assumptions made in the model are coloured by this difference between the real world and the hypothetical world of BT NGN adoption. Considerable care needs to be taken therefore by Ofcom to adopt modelled values that are internally consistent with the hypothetical world where BT, or the average efficient operator, has had NGN for some years, and other operators have performance followed.
- It is not clear, in this context, whether the assumption of 20 points of interconnection is the correct one, where the broad consensus of NGNUK would appear to be 27+2. At the very least, in the next version of the model there should be a sensitivity analysis of the impact on termination and origination of varying the number of points of interconnect – such an analysis could then inform the debate on the importance of this number to the costs of the regulated services, and potentially, point to the most cost efficient solution for the industry as a whole.

³ For reference in Ofcom's mobile model the mobile equivalent is 10% of this, to no obvious customer detriment

Cost recovery of peak vs. annual traffic

Inevitably, traffic dimensioned assets are dimensioned by the peak traffic volume that the network has to be able to support, to agreed levels of QoS and appropriate levels of equipment utilisation. However costs are recovered against the annual volume of traffic. In the case of the pure LRIC of termination, where fundamentally only one service is being recovered, the different bases of peak and annual traffic are not relevant, provided the model is correctly measuring and dimensioning the increase in *network* peak traffic arising from regulated termination. Nor is the matter relevant in a multi-service recovery in the case where all services bear the same busy hour to annual traffic proportion and the busy hour of all services is the same. But this is not the position in the fixed model and in the real world of fixed telecommunications, where there are different service and segment specific busy hours that may or may not coincide with the network busy hour, and different busy hour/annual relationships for different services.

In the mobile model it was established that the busy hour/annual weighting of data was different from that of voice, and in order that costs were being correctly split between voice and data in proportion to their relative busy hour resource demands (i.e. their overall contribution to network dimensioning and costs) an adjustment was made to the cost recovery weighting (inside the network element output and data traffic volumes) to compensate for this. No such adjustment has apparently been made in the fixed model even though here too there is a different busy hour/annual weighting between voice and data services – this would suggest that under LRIC+ the model may well not be properly allocating costs between different services, and in particular not splitting overall costs properly between voice and data.

The problem is exacerbated in that the model currently uses four different busy hour to annual relationships:

- Residential voice
- Residential data
- Business voice
- Business data

Whilst this might well be the correct way to dimension the traffic, the use of multiple different busy hour/annual relationships suggests the importance of the need for an adjustment to compensate for the potential costing error that might arise from this in terms of mis-weighting the cost recovery allocation between voice and data. We cannot see that there is currently such an adjustment in the model.

There is a further related point in that the model does not appear to develop an overall network busy hour for dimensioning purposes. To the extent that nodes in whole or in part are dimensioned by the traffic that is passing through them, rather than by the number of lines connected or any other dimensioning rule, this omission would seem to be an error. The network busy hour at any particular node is not necessarily the traffic generated from the sum of the four busy hours enumerated above, but rather a different, potentially smaller value, that may be represented, depending upon the underlying reality, by a daytime peak or an evening peak (the

latter created primarily by residential data traffic). It is the network busy hour that drives the dimensioning of traffic related components: the relative proportionate contributions of voice and data to the network busy hour should drive the overall split of costs between voice and data before a secondary allocation is made to recover voice costs over annual traffic volumes pro-rata to the resource expended for each individual voice service.

Traffic and service modelling

Unlike the network part of the model, which is arguably too complex in its disaggregation of asset elements, the traffic module is perhaps a little light on necessary detail. One obvious point relates to sensitivity analysis. In the mobile model multiple traffic scenarios were examined and developed in order to create a central “medium” forecast. This exercise has yet to be undertaken for the fixed model, particularly in relation to the forecast of future data traffic, which is clearly very uncertain. The sensitivity of termination and origination voice costs to varying data traffic volumes needs to be established. We are also not clear that the method of deriving the forecast annual volume of data traffic is particularly robust.

It is not obvious that the modelled definition of voice services is necessarily in alignment with the services that may become regulated. For example on incoming, the model has three services:

- 3 Off-net incoming calls (national single aggregation node)
- 5 Off-net incoming calls (national cross core)
- 7 Off-net incoming calls (international)

However it may be that the terminating traffic leg that becomes regulated will be only the cost from the national single aggregation node to the final destination. But obviously regulation should relate to all incoming traffic not just that traffic that conforms to service 3. In this case the regulated service will encompass all of 3, but also a significant component of services 5 and 7. If this is so, in order to be certain that the model is identifying only the incremental assets required from the regulated leg of termination, voice services that are modelled need to be redefined so that the model follows the regulated structure, so that for example services 5 and 7 are each decomposed into two separate services, one comprising the proposed regulated element, perhaps the interconnection node and the route from the last aggregation node to the customer, and the other comprising any component of the rest of the route that is not proposed to be regulated. The last increment calculation would then be only performed on the regulated element of the route for the sum of services 3, 5 and 7.

A similar consideration potentially applies to call origination, if only the first leg from the customer to the first aggregation node, plus the interconnect node were to become regulated. In any event, a more flexible definition of services in the model would clearly allow Ofcom to be more flexible in its definition of which services are to be regulated, and on what basis, and allow the modelled services to match the regulated voice call components.

Pure LRIC and LRIC+ outcomes

At the moment the model appears to aim to produce a LRIC of termination, when termination is considered to be the last increment, and a fully recovered LRIC+ of all services. This may not necessarily be correct: if the model is required to produce a LRIC of termination and a LRIC+ of origination (however these two services are eventually defined in routing terms), then the LRIC+ of origination should most likely be run on a scenario of the model that has already identified and eliminated the LRIC of termination. In other words the LRIC+ of origination should be run on a modelled scenario that includes the traffic of all services except the regulated element of the termination service (but would include any non-regulated element of terminating traffic).

Vodafone Limited 9th November 2012