Vodafone's response to Ofcom's consultation

"Review of the fixed narrowband services markets

Consultation on the proposed markets, market power determinations and remedies"

March 2013

Non-Confidential

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Summary and conclusions

Vodafone broadly supports the proposals set out by Ofcom in the consultation.

1. We agree that geographic termination rates should be set according to the pure-LRIC cost, based on a model of an efficient NGN-based network. The model developed for Ofcom is broadly fit-for-purpose, with the caveats we set out in this response. The change should take effect from October 2013: any delay would disregard the deadline recommended by the European Commission.

2. Whilst appreciating the logic for the removal of regulation of standalone CPS and Indirect Access, we consider that Ofcom has not appreciated the ramifications of its proposals, and therefore that a stop-sell approach is more proportionate.

3. Vodafone absolutely disagrees with the proposal that single tandem transit be deregulated. The existing light-touch regulatory control needs to be retained to promote effective competition.

4. We do not agree with the outputs of the model and thus the proposed charge control levels. In general we agree with much of the methodology employed, but highlight a series of issues, notably:

    a. The recovery of passive asset costs, where we advance reasons for a lower % mark-up;
    b. The calibration uplift, which we suggest is unnecessary;
    c. The reallocation of the "missing" fixed and common costs notionally applied to termination where we explain that a constant per minute addition to a limited set of services with varying costs is not correct;
    d. Assumptions of asset utilisation

    When these corrections are applied the rates proposed by Ofcom for termination and origination change as follows (in ppm, 2011/12 prices)

Outputs in ppm	2013/14	2014/15	2015/16
Ofcom termination	**0.040**	**0.037**	**0.034**
Revised termination	**0.036**	**0.033**	**0.030**
Ofcom origination	**0.297**	**0.270**	**0.244**
Revised origination	**0.195**	**0.176**	**0.157**

5. Whilst we agree with Ofcom that common costs displaced from geographic call termination should be met in part from retail and regulated call origination charges, we disagree with the outcome under Ofcom's proposed levels of charge control where this results in a short-term increase in NGCS origination charges. The disruption this would cause to NGCS pricing during the first year

of the charge control, i.e. the period where transitional arrangements to unbundled charging regime will be laid down, is both significant and best avoided. Acceptance of Vodafone's revised charge control for origination as above removes any such short–term upward fluctuation to NGCS origination pricing. In the alternative, we believe there is a compelling case, due to the unfortunate mismatch in timing between the NCC and NGCS transition, to either temporarily freeze NGCS payments, or temporarily exclude NGCS from the originating minutes which take on the common costs displaced from termination. In the case of CPS origination, Vodafone sets out an alternate approach in this response which would result in more rational retail pricing signals.

6. We are disappointed that BT is to continue to be afforded the flexibility to set wholesale prices on a time-of-day basis. We urge Ofcom to reconsider this discriminatory conclusion.

7. Vodafone concurs that IP cannot yet be concluded to be the MEA for interconnection. While agreeing with the principle of Ofcom's proposals on interconnection of heterogeneous networks, we believe an opportunity has been missed to develop a framework for recognising when IP has become the MEA.

1: Wholesale Call Origination and CPS

Vodafone supports Ofcom's conclusion that BT has Significant Market Power in call origination. However, we do not consider the removal of the obligation to provide standalone CPS to be proportionate. If the remedy is removed, rather than an outright sunset date, Vodafone proposes a "stop-sell" arrangement with the capability allowed to wither on the vine. Additionally, the proposed wording needs revision, as it inadvertently forecloses much of the combined WLR+CPS market that Ofcom wishes to continue.

Vodafone supports Ofcom's conclusions that BT has ongoing Significant Market Power (SMP) in the provision of wholesale call origination. While there has been a growth in the usage of full MPF LLU since the last narrowband market review, there are significant geographic and product areas where competing CPs have little option but to purchase wholesale call origination services from BT:

- **Geography:** Outside "Market 3" areas, competing CPs have little choice but to purchase voice and broadband services from BT. It therefore follows that BT must have SMP in these services.

- **Product:** It is uneconomic to provide single-play voice services on MPF LLU lines. Ofcom acknowledges that retail voice services are a distinguishable market from broadband services by the fact that they are subject to separate market reviews. Whilst Vodafone acknowledges that parts of the retail market have evolved to bundled voice and broadband services, there remains a significant part of the market that either solely requires voice services, or where consumers wish to purchase voice independently of broadband access. Therefore, even in "Market 3" areas, removal of SMP remedies would foreclose competition in the single-play voice market.

Vodafone supports Ofcom's conclusion that it must be possible for WLR providers to use calls providers other than BT, therefore an SMP condition that allows purchase of CPS in these circumstances is required. We are unconvinced, however, of the economic rationale for the requirement to end the provision of standalone CPS. In paragraph 5.267…9 of the consultation, Ofcom states:

> 5.267 As set out previously, the number of calls-only CPS subscribers has declined and is a very small proprotion [sic] of BT Retail's current customers.
>
> 5.268 In light of these changed market conditions, we propose to remove the requirement for BT to provide CPS on BT Retail lines. Those customers who currently use CPS on BT Retail lines could alternatively be served through a CP's own lines or through that CP purchasing WLR from BT (at regulated rates). As a result, we consider that the removal of CPS on BT Retail lines would have a limited effect on consumers or competition.

> 5.269 We propose to retain the requirement to offer CPS together with WLR. This will ensure that BT is not able to undermine WLR regulation by refusing to provide call origination which is necessary for WLR providers to offer retail call services.

This appears to suggest that the remedy of standalone CPS be removed because it is not widely used, indeed that CPS and WLR be explicitly tied together. The *quid pro quo* of this would be that wholesale lines access (WLA) and wholesale call origination are inseparable markets, which would call into question the whole basis of Ofcom's market analysis. Whilst the conclusions of a combined market analysis may well be the same, it is curious that this issue has not been addressed.

An alternate viewpoint to justify the change would assert that standalone CPS should not be provided on lines served by BT Retail because it no longer has SMP in retail call origination. Vodafone does not have the market data to assess whether this is a valid assertion. Whilst overall it is true that BT Retail's market share has diminished, for this argument to hold true the scope of the market against which their share would need to be assessed is not retail voice services as a whole, but instead any voice services (whether combined with broadband or not) in Markets 1 and 2, plus voice-only lines in Market 3. Again, this analysis appears to be omitted from the consultation.

Regardless of the justification, Vodafone is concerned about the implications for wholesale competition of removing the standalone CPS requirement. In effect, BT Wholesale Calls is a service which provides CPS, but where the calls carrier is BT itself. Should the regulatory requirement to provide standalone CPS on BT Retail lines be removed, in order to provide a level playing field BT Wholesale should not be allowed to provide Wholesale Calls to third parties on those lines either, unless a commercial standalone CPS solution is offered which is capable of passing a margin squeeze test with Wholesale Calls. Absent this, BT would in effect be uniquely able to provide a service that appears to all intents and purposes to be CPS, from all lines. BT would be able to use its ability to offer wholesale calls from all lines (whether line rental was BT Retail or a third party), whereas competing calls providers that could only utilise the regulated CPS service would be limited to third party WLR lines. While recognising this could be addressed on an *ex post* basis, experience in seeking competition law enforced in this market demonstrates that approach insufficient.

Vodafone also has concerns about the proposed wording of the SMP condition:

> 2.1 Without prejudice to the generality of Condition 1, the provision of network access under Condition 1 shall include access to network elements and/or facilities to allow Carrier Pre-Selection, where the request for access is **made by a Third Party** to provide a Publicly Available Telephone Service to a Subscriber **where the Dominant Provider is providing Wholesale Line Rental to that Third Party** in respect of that Subscriber.

(our emphasis)

We believe the proposed wording fundamentally misunderstands the nature of the supply chain for WLR. A reseller providing services to retail customers using a third party network provider has two options:

1. Purchase WLR from Openreach, and engage a calls provider such as Vodafone to provide service. Vodafone would then provide a wholesale calls service by purchasing the CPS service from BT Wholesale. Alternatively,

2. Outsource the whole activity to a provider such as Vodafone, so Vodafone would then purchase both WLR from Openreach and CPS from BT Wholesale.

Although Vodafone offers both options, in practice because there is little value-add in our purchasing commoditised WLR and selling this onto the reseller, the majority of the market uses the first option. Indeed, as a calls provider, we cannot distinguish between a reseller using (1), and a reseller that is utilising standalone CPS on a BT Retail line – we don't know if they've WLR'd the line. Further, we would question whether BT themselves know the full extent of WLR+CPS versus standalone CPS, as only Openreach possess the information on WLR'd lines, and BT Wholesale the information on CPS'd lines.

The proposed wording of SMP condition 2.1 would preclude the use of approach (1), because the Third Party being provided WLR would be the reseller, and the Third Party requesting CPS would be the wholesale calls provider (e.g. Vodafone): as these are not the same Provider the test would not be passed.

Vodafone can foresee two solutions to this, namely:

a. Amend the text so that it reads *"request for access is made by a Third Party or other party acting on their behalf"*, or

b. Amend the text so that it reads "*where the Dominant Provider is providing Wholesale Line Rental to ~~that~~ a Third Party in respect of that Subscriber."*

Option (a) most precisely targets the regulation to lock WLR and CPS together, but could be costly to implement. In order for BT Wholesale, when processing a CPS order, to know that the wholesale calls provider such as Vodafone was really acting upon the wishes of the WLR purchaser, there would need to be a chain-of-trust, e.g. by Openreach providing some form of unique key. It is our view that this would be disproportionate for such a legacy service as it would require systems development by all parties in the value chain. Within the time constraints of this consultation we have not been able to quantify this (to do so would require industry agreement on a solution), but believe the pan-industry cost will easily run to £millions.

Option (b) is far simpler to implement in that BT Wholesale would merely need to confirm with Openreach that the line had been WLR'd to a third party. However, it

does suffer from the theoretical shortcoming that the wholesale calls provider may not be acting on behalf of the party that had WLR'd the line. On balance Vodafone considers this to be the more proportionate measure, as it ring-fences development to companies within the BT Group who are asserting the need for the regulation to be relaxed.

However, resolution of this issue does not entirely remove the problem of implementing the intended regulation, i.e. the difficulty of ensuring that combined WLR/CPS is allowed but standalone CPS isn't, particularly on a retrospective basis.

On a prospective basis, a wholesale calls provider such as Vodafone would have little choice but to accept the reseller's word that they had purchased WLR from Openreach. Our only validation tool for this would be to place a CPS order with BTWholesale, and if it is rejected conclude that the reseller was in error when they asserted the line was WLR'd. As such, it is likely that there will be an increase in failed orders. Further under approach (b) we would have no way of knowing if we were unwittingly arranging for calls to be billed by a different party to the line rental provider, i.e. providing standalone CPS by the back door.

The situation is even more serious on a retrospective basis. Vodafone understands that the intent of the regulation is to mean that the requirement for BT to support existing standalone CPS customers would be removed. However, we have no accurate visibility of which of the lines where we have purchased CPS were done so on a standalone basis, versus after our reseller customer had independently WLR'd the line. It is therefore impossible for us to know which lines will have the capability removed because they're considered to be standalone CPS without a significant audit task. Any error in this audit (so for example we removed the account from our network but BT did not remove CPS from the line) would result in the customer having all of their calls fail to a recorded announcement. Alternatively were BT to decide to continue to provide standalone CPS on a wholesale basis, we could not know which lines would potentially have a differential call-origination fee levied[1].

From an end customer messaging standpoint, this retrospective situation is even more extreme. While acknowledging that it is a limited market, Vodafone questions how a satisfactory explanation could be constructed to explain to retail customers using standalone CPS why, when the access lines and calls markets are considered to be separate from a regulatory standpoint, they are being forced to purchase both from the same provider hence having to change either lines or calls provider. We believe it would be unprecedented for existing customers to be told that they must purchase additional services or find a new provider. We believe this can never have been Ofcom's intention as it contradicts Ofcom's duty to *"further the interests…of consumers"*[2]. We believe such an outcome may well hinder competition by driving these consumers back to BT Retail as a result of confusion and a desire for certainty,

[1] On the assumption that a commercial service offered by BT would be charged at a different rate to a regulated one.
[2] http://www.ofcom.org.uk/about/what-is-ofcom/

rather them exercising competitive choice. Ofcom must find a solution that safeguards the interests of these consumers, whilst still enacting any change to future remedies.

For these reasons, Vodafone considers that far from being disproportionate to maintain standalone CPS, in reality the situation is too complex to unpick and it would be disproportionate to expect industry to carry out this task for what is believed to be a limited and declining market. Our preference would therefore be to acknowledge that it is an anomaly, but simply continue to provide standalone CPS. As an alternative, Vodafone proposes that rather than the sunset date being one where standalone CPS no longer be mandated, instead it act as a “stop-sell” point, where no new standalone CPS provide orders are permitted. Indeed, because this would not affect existing customers, a more aggressive timeline could be adopted, for example stop-sell being applied from January 2014. The existing capability would then wither on the vine, with a view to removing the mandate at the next market review.

2 : Wholesale Call Origination and the NGCS Market

Vodafone welcomes Ofcom's efforts to bridge the gap between the start of the network charge control and the implementation of unbundled tariff NGCS regime. However we feel that the proposals would disrupt the NGCS market at a particularly sensitive time. Vodafone believes that adoption of our proposals set out in section 6 below regarding the design of the charge control can serve to mitigate this problem, or in the alternative that the current arrangements should be frozen.

[✂]

Vodafone welcomes Ofcom's desire to come up with a solution that effectively bridges the gap between the start of the new network charge control regime on the 1st of October 2013 and the commencement of the unbundled tariff Non-Geographic Call Service arrangement later in 2014 or early in 2015. With the NGCS market in state of flux due to the imminent transition to the new regime we believe that it is imperative that Ofcom does everything it can stabilise the market providing certainty and stability to all stakeholders, including the very many businesses and organisations that rely on NGCS as critical means of communications. We therefore whole-heartedly agree that it is necessary to retain the call origination obligation and associated charge control for NGCS until such time as the unbundled NGCS regime is introduced, but believe that imposing an RPI+18% increase on NGCS origination at 1st October 2013 would be disruptive.

NGCS are hugely important to the UK economy, providing a key means for businesses to communicate with their customers, acting as both as an initial channel to market and as a vital in-life communications tool, allowing consumers to communicate without reference to UK geography. They enable businesses to organise their operations efficiently and make use of technology to improve the overall customer contact experience.

As we head towards the point where today's NGCS chargebands are consolidated and then mapped on to new unbundled NGCS Service Charges we need to keep things as simple as possible, minimising tariff uncertainty and avoiding any price shocks. Vodafone has been active in communicating the extent of the expected NGCS changes with its business customers who make use of NGCS numbers as a key part of their contact strategy. In doing so we have been giving guidance on the regulatory changes that lie ahead, so they are well signalled and understood. However a step reduction in POLOs and an increase in Freephone costs due to increased call origination charges has not been forecast at this point and we must take steps to minimise the impact on end users. The cumulative impact of a significant adverse tariff movement on Freephone and lower value 08 services, quickly followed by the transition to an unbundled tariff may cause many users to lose faith in Non-Geographic Call Services. We need to do all that we can to promote stability in this vibrant and competitive area of the communications landscape in the United Kingdom.

0845 POLOs in particular have fallen significantly over the past 18 months and the a further increase in the cost of call origination by RPI+18% will have a further detrimental impact on 0845 as well as all other NGCS. The impact of this change on Freephone, 0845 and 0844 revenues from October this year should not be underestimated with the expected 0845 POLO down a further 6.2%, that is 30% down from the rate in October 2011[3]. To best serve consumers we believe that Ofcom must make an effort to minimise any disruption as far as possible and believe it would be preferable to smooth out the impact of call origination price changes on NGCS POLOs. This smoothing effect could be done in a variety of ways:

- The amendments we propose to the model in Section 6, if taken in their entirety, would lead to BT's retention on NGCS being broadly unaltered.

- Regardless of the model output, there is a strong argument for a regulatory freeze on POLO / ROLOs[4] at their 30th of September 2013 levels until the point of transition to the new NGCS regime. This would provide a stable jumping off point for the unbundled tariff structure, and give much needed industry certainty during the next 18 months while NGCS changes are finalised.

- In the event that Vodafone's model adjustments were not to be accepted, it would be possible, as set out in Section 7.3 of this response, to smooth the charge control profile and reduce the extent of the one off change in call origination pricing as it relates to NGCS services by combining the expected RPI+18% increase in October 2013, with the RPI-9% decrease in the two subsequent years. By combining the ups and down from the outset it would result in a far more modest one off change to call origination as it relates to NGCS, with stability thereafter.

- As set out in Section 7.2 of this response, because of the unique situation of the transition to unbundled charging almost but not quite coinciding with the commencement of the NCC, we consider it appropriate to simply temporarily ring-fence NGCS from the general call origination change to decouple the separate NGCS market. By doing this any common cost displaced might be picked up by CPS, so they could more easily be absorbed by providers as they can be offset against the price reduction on geographic call termination costs amongst the same user group. As it stands while CPS users will see call origination costs rise, the impact of this will be entirely mitigated by geographic termination reductions. In contrast in NGCS there is no mitigation of any cost increase/revenue reduction and end users will have to meet the full cost of the

[3] 0845 Daytime POLO October 2011: 1.7124ppm
0845 Daytime POLO April 2013: 1.2782ppm
0845 Daytime POLO estimate October 2013:
1.1989 (assumes discounts are static with planned increases to call origination and Retail Uplift)

[4] POLO – Payment to Other Licenced Operators (Historic name for out-payment made by originating providers to the terminators of non-geographic numbers.
ROLO – Receipt from Other Licenced Operators (Historic name for the payment made by Terminating Providers to Originating Providers relating to the receipt of Freephone traffic)

change with little advanced warning. We believe there is a strong case to temporarily ring-fence NGCS to promote stability and benefit the end consumer.

Any one of these options would help achieve market stability and give consumers and businesses much needed certainty at a time of flux, making the market well placed to make a successful transition to the new regime.

[✂]

3 : Call Termination

Vodafone agrees with Ofcom's proposals on the regulation of geographic call termination services, although we believe the wording requires some attention. We believe more regulatory effort should be dedicated to ensuring compliance. Although we agree with Ofcom's conclusions about the interaction with the regulation of number portability, we consider a review of the operation of General Condition 18 in the context of Geographic Number Portability is overdue.

Vodafone agrees that until such a time that there is mass adoption of (as yet unavailable) technology to allow seamless delivery of calls to a given number at a single retail end point using multiple terminating networks, it is self-evident that each rangeholder has SMP in call termination. We agree with the proposal to shift the regulatory burden onto the rangeholder rather than it lying with the terminating network. In the case of hosted number ranges the mandate for regulatory compliance should still reside with the rangeholder, and it is for them to ensure they have suitable commercial arrangements with their subcontractors (i.e. the network provider) to achieve this rather than for Ofcom to chase along their supply chain to enforce regulation.

Vodafone agrees that it is pragmatic to implement the solution of imposing a charge control on BT, and a Fair & Reasonable obligation together with regulatory guidance on other rangeholding CPs. We do, however, have reservations about Ofcom's willingness to enforce compliance with this obligation. Following the introduction of new regulatory guidance on Fair & Reasonable geographic termination rates in October 2012, there is still a substantial tail of small CPs who are charging above the LES benchmark rate. Due to their size, it is often not an effective use of time for those CPs routeing calls to these dominant terminating providers to pursue them to comply with the regulatory guidance. Ofcom are reluctant to open a dispute unless significant negotiations have taken place, something that is both time consuming and impractical. We believe such matters of compliance are largely binary, with the party involved actively seeking to avoid any kind of direct negotiation. While the monetary sums involved may be trivial, these small CPs are able to flout regulations with impunity, creating a two-tier regulatory environment which does not reflect well on Ofcom. Vodafone considers that since the termination rates are freely available in the BT Carrier Price List[5], Ofcom should be proactively pursuing those charging well above the benchmark, using the regulatory sanction of threatening to withdraw the effected numbers due to misuse as appropriate.

Vodafone strongly agrees with Ofcom that there have been no compelling arguments presented to diverge from the European Commission Recommendation that termination rates be based upon pure-LRIC modelling of an efficient network. It seems apparent that this model of an efficient network should be constructed using an

[5] Section B.1.02.1, https://www.btwholesale.com/pages/static/Library/Pricing_and_Contractual_Information/carrier_price_list/cpl_sectionb1telephony.htm

assumption of NGN technology, but we caveat this observation by the limited ability to benchmark against real world implementations. This said, a check against actual incremental costs incurred in operating (largely depreciated) TDM networks ensures that rangeholders can recover their fairly incurred costs: we understand this formed part of the analysis. Vodafone sees no justification for continuing to use models based upon TDM technology, or for the models to use approaches such as FAC-CCA. To do so would run counter to the Commission Recommendation, and result in a slanted competitive position for mobile network operators that have already seen their termination rates reduced to a pure-LRIC basis.

Given the Recommendation proposed compliance by the end of 2012, coupled with the approach already being adopted for Mobile Call Termination, Vodafone supports Ofcom's proposals that there be no glidepath and the regime be introduced immediately at the start of the new charge control in October 2013.

Vodafone notes that in the SMP notifications, the text for describing call termination reads as follows[6]:

> Call termination services that are provided by the Dominant Provider to another communications provider, for the termination of voice calls to United Kingdom geographic numbers **which the Dominant Provider has been allocated by Ofcom in the area served by the Dominant Provider**

(our emphasis)

We have some concerns as to whether this adequately addresses the situation of ported numbers. It seems apparent that the text will ensure that a rangeholder (donor) CP is considered dominant, but it is less clear whether the text will consider the recipient CP would be similarly so. This hinges on whether the individual ported number is *de facto* deemed to be allocated by Ofcom to the Recipient CP, despite there having been no direct allocation as such. Whilst we note that General Condition 18.6 has a catch-all requirement that "Portability" be provided on Reasonable terms by the Recipient Provider, it is a moot point whether this is intended to address the topic of wholesale termination rates. Although we are unaware of this issue causing problems thus far in the context of Geographic Number Portability, changes to the wording of Call Termination SMP designation to catch imported numbers would potentially head off future issues, particularly in the context of our next topic.

Vodafone notes the material in the consultation relating to treatment of calls to ported numbers. It seems apparent that in many cases a recipient CP will *de facto* receive a negative termination rate, because the Average Portability Conveyance Charge (APCC) payable to the rangeholder will be higher than the geographic termination rate paid by the rangeholder. Like Ofcom, Vodafone considers APCCs to be a cost that will need to be recovered from the recipient CP's retail charges, and that in-of-itself a negative termination rate is not to a reason to vary the number portability regime.

[6] (BT notification used as example, but the same approach applies for other rangeholders as well)

However, we do consider that the time is ripe for Ofcom to review what's "reasonable" in the context of General Condition 18 for the purposes of setting APCCs:

- Vodafone does not consider it appropriate that APCCs should be calculated on a pure-LRIC basis, because the *quid pro quo* of this would be that some of the rangeholder's common network costs, which otherwise would be recovered via the APCC, would instead be recovered from the rangeholder's ongoing retail customers. In effect, current retail customers would be subsidising the cost of service provision for those who have exported away. This can be demonstrated by taking the extreme case of a rangeholder CP losing all of their customers apart from one lone customer who remained: if pure-LRIC charging was adopted for APCCs, this would mean that all common costs of network operation would fall on that remaining customer.

- Similarly, we do not consider that a "LRIC++" charging basis for APCCs (i.e. LRIC with a higher share of common costs to allow for those costs displaced from pure-LRIC services) approach would necessarily be correct, as this might imply that ported customers pick up costs associated with terminating calls to ongoing customers of the rangeholder.

- Therefore LRIC+ may be the correct approach, but given the analysis in this Narrowband Market Review, it would not seem reasonable to be charging anything in excess of the costs of efficient network operation. The Review has clearly concluded that efficient network operation be modelled on the basis of NGN technology with a largely flat network hierarchy, so APCCs should probably be determined on this basis. We suspect that if APCCs were determined on this basis, the spectre of negative termination rates would disappear.

Vodafone urges Ofcom to consider this issue proactively rather than relying upon CPs bringing Disputes.

4 : Transit

Vodafone disagrees with Ofcom's conclusions regarding the transit market. There has been no significant change since the last market review, when it was rightly concluded that BT has SMP in single transit. The remedy of price publication and non-discrimination has worked well. *Ex-post* regulation would not be appropriate because the necessary supporting information to prove a Competition Act case would not be available, and even if it were to be so, BT would have the capability to dominate the market sufficiently to drive out competitors in the time taken to process a case.

Although the revenue generated by BT's Single Transit product is a relatively modest £4M per annum, it remains a vital interconnection product that is essential if all users of telecommunications are to continue to benefit from the seamless and cost effective services they take for granted. A regulated Single Transit product underpins competition in adjacent markets, enabling Communication Providers to offer wholesale pricing to access the very large number of terminating communication providers in the UK.

Since the last market review, the single transit market has declined in size as a result of an overall reduction in call volumes. Ofcom's remedy of no undue discrimination has been effective in ensuring that the competitive pricing pressure felt on the thicker competitive routes has transferred over to the far larger number of thin routes, where barrier to entry remain impossibly high. BT remains keen to discourage direct interconnection between other Communication Providers and preserve revenues and has therefore not sought to increase the cost of single transit. The cost of deploying direct interconnection has also increased over recent years, with an increase in the cost of construction related to network deployment, making future interconnect investment an expensive undertaking, resulting in even higher barriers to entry.

We anticipate that two significant changes will impact the market during the next control period:

1. Transit volumes will start to increase in later 2014 or early in 2015 as the pool of compulsory purchase minutes increases through regulatory changes to the NGCS market, when Terminating providers become responsible for meeting the transit cost on all minutes[7]. This is because if all NGCS transit minutes are

[7] The same is also true in the case of Single Transit services for Transit Number Portability: As all CPs are obliged to export numbers on end user demand, transit number portability has become an essential tool in facilitating portability. Transit porting arrangements are usually put in place in circumstances where number portability has been requested but no interconnect has been established between the donor and recipient networks. Low traffic volumes would make it uneconomic to establish a direct point of interconnect. With a very large number of communications providers operating in the United Kingdom it is not difficult to see why transit number portability has become key in facilitating consumer led portability requests between fixed networks: it is unrealistic to expect thousands of direct interconnect relationships to exist. Transit portability allows exported calls to pass between the donor and recipient networks via BT, and single transit makes up a large proportion of the overall charge. These single transit

paid for by the terminating CP, there would be a disconnect between the CP paying for the transit service and the CP electing to use it : as such is inevitable that volumes would rise as there'd be little incentive on the originating CP not to use the transit facility.

2. Secondly, with the cost of geographic call termination falling by a material amount, the cost of single transit will make up a larger proportion of CPs' costs and therefore make CPs more susceptible to any adverse cost movements.

In the last market review Ofcom rightly reconsidered its initial position on Single Transit, recognising that while the market may be small in revenue terms, it is a very strategic part of the wider narrowband market, critical in promoting wider competition and is a very particular feature of the UK market, where a very large numbers of CPs are present, giving the transit market in the UK characteristics that are not shared with other member states.

The Market is not a level playing field. It is worth highlighting the features of the market that give BT unique and unmatchable advantages in the transit market, with BT able to leverage its rights and duties under the End to End Connectivity obligation and its dominance in other markets to become the default transit provider for the industry. BT's unique position allows it to combine all BT Group generated minutes with the majority (or sometimes all) the remaining industry minutes to make the business case for direct interconnection stack up. Only BT has the scale to do this. It is also able to leverage the advantage it gets from the Standard Interconnect Agreement (SIA), which was written and agreed based on the assumption that key products continue to be regulated. The asymmetric terms of the agreement would not be replicated in a competitive market. We will discuss this issue in more detail elsewhere in this response, but it is important to realise that BT enjoys advantageous terms that allow it to capitalise on its market position.

It is neither practical nor economically efficient to interconnect with every UK CP. Vodafone has pursued a policy of interconnect directly with other CPs where it is efficient to do so and we believe this means that Vodafone has the highest level of interconnection of any provider other than BT. Despite this we are still heavily reliant on the BT Single Transit product. On a monthly basis we review what direct interconnection arrangements are viable. As a rational business we would not undertake speculative interconnect build, unless of course there was a strong indication that volumes were likely to grow to viable levels in the future. This means that a large number of carriers will never reach the point where build becomes viable.

Ofcom also needs to be aware of the role which the BT Carrier Price List performs in the transit market. It would be a mistake to assume that it is merely a list of BT's charges. The CPL is without question a market enabler, it provides a comprehensive list of number ranges in the UK, therefore providing the trigger for CPs to open up ranges (in conjunction with the industry email number range activation distribution list). It also makes it clear what proportion of the cost relates to transit and what proportion relates to termination, without this distinction BT could bundle charges and CPs would

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charges are therefore unavoidable for both existing and future transit number portability arrangements.

be left not knowing how much they were paying for transit. If Ofcom's proposals result in the Carrier Price List no longer performing this function then an industry debate is required to ensure that number ranges are opened and pricing is set, with transparency around both termination and transit charges. Ofcom should not underestimate the impact of that this change may have on the ability of the market to function effectively.
A clear illustration of BT's on-going market power is its persistent refusal to pay transit costs to other CPs. Despite BT's acknowledgement that it does use third parties to connect to some range-holding CPs, it doesn't pay any transit fees. When we have approached the issue in the past we have been informed that 'BT doesn't pay transit'. If the market were indeed edging towards competition, such a situation would be untenable. Unfortunately it remains and goes unchallenged due to the costs involved in mounting a dispute.

We believe the network arrangements for voice telecommunications in the United Kingdom are significantly more complex that most other EU member states, with a very large number of market participants, including a sizable tail of smaller operators. No CP can eradicate the need to purchase Single Transit (as even those CPs who make use of an alternative provider's transit service will be indirectly reliant on BT's Single Transit product to reach a very large number of destinations). Single Transit is also an unavoidable product in number porting and in the NTS market, where CPs have no alternative but to purchase it from BT.

With a backdrop of no material change in the market since 2009, with even greater barriers to entry and a lack of any prospect of competitive entry, coupled with the expected increase in demand through the extension of the regulatory requirement to purchase compulsory transit minutes there is a very compelling case to continue with the current SMP finding and proportionate remedy.

We understand that the Commission has expressed the view that as transit is no longer on the list of markets where SMP remedies are presumed and that as the existing *ex-ante* remedy is at least on paper similar to the *ex-post* competition law outcome, then it would seem appropriate to roll back the *ex-ante* remedy and rely on *ex-post* enforcement. At a very generic level we understand how this approach would appear, at face value at least, to have some justification, however when the matter is considered in the national context, looking specifically at the UK market and regulatory regime that justification falls away. We are in no doubt that if *ex-ante* remedy was removed it would not be an outcome that would serve the consumer interest as it would in fact create some very real obstacles to competition.

The deregulation of this market would allow BT to act in an unconstrained manner actively discriminating against its competitors by raising costs way beyond anything possible in a competitive market, due to the many bottleneck routes that would remain. A comparison between the markets for single transit, and number portability transit, serves to illustrate BT's likely behaviour. In the single transit market, the current non-discrimination obligation means BT is compelled to price competitive "thick" and non-competitive "thin" routes equally, and this results in a peak time rate of 0.0238ppm. In contrast, for number portability transit, inherently BT's service is only used on non-

competitive “thin” routes, since for larger routes the rangeholder and recipient networks would directly interconnect: as such it provides a good predictor of how BT would tariff non-competitive thin routes in the generic transit market. BT charges 0.1139ppm peak for such calls, almost five times as much as where their behaviour is constrained. If deregulation were to mean such behaviour is repeated in the single transit market, it would be difficult to challenge as the Competition Act would not act as any kind of constraint:

- With no price publication obligations, the evidence required to mount a challenge would be very difficult if not impossible to provide. We have first-hand experience of the evidence requirements needed for Ofcom to open a Competition Act investigation and we would put the prospects of being able to meet the evidence threshold as very slim in the transit market due the lack of disclosure requirements. Unless there was a legislative change we believe this barrier is insurmountable.

- A large number of CPs may be affected, with a varying financial impact. The cumulative impact of the market would be significant, but it may be something that CPs would have to tolerate due to the very high costs involved in pursuing a case when set against the benefit on a CP by CP basis. Industry collaboration on such a case would be problematic and unlikely to succeed.

- The length of time taken to open and proceed with a Competition Act complaint is significant, with five years or more not untypical. Waiting this long for redress is not acceptable to competing CP who rightly deserve the speedy investigation of any areas of concern.

- Ofcom have typically looked at case of margin squeeze at the overall product level rather than on a contract by contract basis (e.g. Gamma’s Wholesale calls challenge in 2004/5). It is therefore highly likely that the pricing on the ‘thick’ high volume competitive routes would mask any anti-competitive pricing on the ‘thin’ routes, condemning any challenge to failure before it had begun, even if margin squeeze was evident on the product on an individual contract basis.

It is our firm belief that based on the experience of Competition Act enforcement in our industry; an *ex-post* remedy is entirely unsuitable to safeguard consumers in the transit market. Ofcom are best placed to take the right decisions on remedies for the UK market, having a detailed understanding of the UK’s particular market dynamics and structure. We are of the strong belief that this is a clear case where the UK must maintain a specific remedy that was introduced to fit the UK market place and that the alternative one size fits all approach of leaving only *ex-post* enforcement in place would compromise competition in the UK market. There remains no prospect of the market tending towards competition and competition law is not able to adequately address the future consequences of a deregulated market. These factors mean we are in no doubt that the UK transit market meets each of the three criteria specified by the Commission when assessing if it is appropriate to regulate a market not on the Commission’s list.

In light of the above, Vodafone has material concerns from a legal perspective about Ofcom's failure to consider and take into account all relevant facts and circumstances when formulating its proposed form of regulatory intervention; this error would, if uncorrected, result in a decision that would be insufficiently reasoned and highly likely to have deleterious consequences upon the position of BT's trading partners in markets beyond the single transit market. We consider the basis for Ofcom's approach in further detail below and explain why any decision to adopt the approach proposed in the consultation document would simply not be robust or capable of meeting the standard that Ofcom must attain when undertaking its role.

Vodafone would endorse Ofcom's decision, for the purposes of its analysis, not to attach weight to the fact that the single transit market is not included in the list of recommended relevant markets (as understood in competition law terms) that are susceptible to *ex ante* regulation. The European Commission, which has responsibility for defining and publishing that list of markets, recognises in its most recent consultation that this list is simply the starting point for NRAs when identifying the scope or focus for regulatory intervention on a prospective basis:

> "It [the list of relevant markets] allows the National Regulatory Authorities to focus their regulatory efforts on markets where competition is not yet effective and which are crucial for Europe's competitiveness. Having a list of pre-identified markets helps National Regulatory Authorities to regulate these markets in a coordinated manner, thereby contributing to the development of the internal market."[8]

There can be no inference capable of being drawn that the withdrawal or the absence of specific markets from the list of relevant markets is indicative that these other markets are subject to effective competition across all 27 EU Member States.

Such a conclusion is logical because the Community legislature has, in recognition of the fact there may be significant differences in competitive conditions across national boundaries, elected to allocate responsibility for the actual application of a set of harmonised principles and methodologies to NRAs. Accordingly, it is for NRAs to define relevant markets, assess those markets in a way consistent with a well-established competition law and economic framework and determine the remedies to be imposed where markets are not deemed effectively competitive. That approach is plainly consistent with the well-established principle of subsidiarity in Community law. Indeed, the pan-European harmonised Common Regulatory Framework ("CRF") plainly envisages that an NRA might define a relevant market according to the facts of a local market, provided that the approach pursued is consistent with that contemplated by the guidance on the definition on relevant markets:

> "National regulatory authorities shall, taking the utmost account of the Recommendation and the Guidelines [on defining markets], define relevant markets

[8] http://ec.europa.eu/digital-agenda/en/news/public-consultation-revision-recommendation-relevant-markets

> appropriate to national circumstances, in particular relevant geographic markets within their territory, in accordance with the principles of competition law."[9]

This clear delineation of responsibility between the European Commission and NRAs extends not simply to the market analysis, but even more obviously in relation to the precise form of the regulatory intervention to be adopted. Whilst, the European Commission has secured the ability to 'veto' market definitions or a finding that a market is or is not effectively competitive, no such veto exists in relation to the remedies that an NRA may impose in relation to a market that it has found not to be effectively competitive. Thus, it is for Ofcom to determine the appropriate form of any remedy in the event of a finding of SMP.

The fact that the European Commission may have indicated its preference for the removal of the existing SMP obligation of non-discrimination in the single transit market can, as a matter of law, only have a limited bearing on Ofcom's ultimate decision. Whilst Ofcom is required to take 'utmost account' of the views of the European Commission or other NRAs, the Community courts have previously emphasised that this expression does not connote any binding obligation on the part of the NRA:

> "Accordingly, in a case where the comments of an NRA and of the Commission are contradictory, the notifying NRA would not infringe Article 7(5) of Directive 2002/21 by following, after careful review of the various comments, the approach proposed by the other NRA and not that proposed by the Commission."[10]

Accordingly, it is for Ofcom to be satisfied in the first instance that the removal of the current *ex ante* SMP obligations would not pose a risk to the competitive process. In this case, it is far from clear that it has appreciated the significance of the transit market and a number of other markets that are closely linked to it.

Indeed, Ofcom has itself recognised that the starting point for its analysis must be that where markets are not effectively competitive, *ex ante* regulation is more likely to preserve and promote the competitive process. In the case of the NTS market review some years ago[11], Ofcom proposed the imposition of a non-discrimination obligation precisely it would be likely to facilitate competition in other (neighbouring) markets. While the issues within the NTS Market presented its own particularly complexities that

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[9] Directive 2002/21/EC on a common regulatory framework for electronic communications networks and services, Article 15(3)

[10] Case T-109/06, *Vodafone Espana and Vodafone Group Plc v European Commission*, paragraph 93

[11] Ofcom, Call Termination Market Review, 22 October 2004, paragraphs 5.12 and 5.34:"*Where markets are effectively competitive, ex post competition law is sufficient to deal with any competition abuses that may arise. However, without the imposition of ex ante regulations to promote actively the development of competition in a market that is not effectively competitive, it is unlikely that ex post general competition law powers will be sufficient to ensure that effective competition becomes established…Option (b) [a non-discrimination obligation] should increase the competitiveness of related markets by precluding the possibility of BT engaging in discriminatory charge changes and refusing to supply access.*"

Ofcom is seeking to address in the NGCS review, the broader principles and conceptual framework used by Ofcom when considering competition concerns and inability of ex-post regulation to address the consequences of market failure issue are largely analogous and highly relevant to the situation that Ofcom is seeking to address in relation to the single transit market.

In proposing the withdrawal of the current regulatory obligations imposed on BT, as the SMP operator, Ofcom appears to rely entirely upon on the effectiveness of the *ex post* competition law enforcement framework. Ofcom's own economic analysis of the relevant market recognises that there have been no changes to market structure or to the barriers to entry since its last market review (which resulted in SMP obligations being retained). The sole difference appears to be a new conviction that the *ex post* competition law enforcement regime will serve to act as an effective form of discipline on the SMP provider.

Specifically, Ofcom appears to be sanguine about its ability to act swiftly to address competitive harm and resolve competition complaints within a clearly designated timeframe. Unfortunately, this is little more than an unsubstantiated assertion; Ofcom's own guidance on competition law enforcement is unable to provide even the vaguest of estimates as to the length of a competition law investigation:

> "Investigations under the Competition Act are typically complex, requiring a great deal of detailed information gathering and analysis. **Experience has shown us that Competition Act investigations therefore tend to take longer than other types of investigations – in some cases, several years. Ofcom has therefore decided not to set a target for completion of such investigations.**"[12]

[Vodafone emphasis]

As noted above, Vodafone would agree with Ofcom's own factual description of Competition Act investigations having witnessed first-hand as a complainant the length of time that it has taken for an abuse of dominance complaint to be investigated. Ofcom cannot therefore claim with any confidence that the risk of structural damage to any market resulting from anti-competitive conduct is likely to be limited if its processes are so open-ended.

Nor can Ofcom take comfort from the fact that any immediate harm resulting could be remedied through the adoption of interim measures prior to the completion of any formal investigation; as Ofcom itself correctly recognises in its enforcement guidelines, it may "*only issue such directions where we consider it necessary to prevent serious and irreparable damage to a particular person or to protect the public interest*[13]." Past precedent has revealed this threshold to be a very high one, with the potential exit of a market participant and the consequential damage to competition the most obvious

[12] Ofcom, *Enforcement Guidelines. Ofcom's guidelines for the handling of competition complaints and complaints concerning regulatory rules*, 25 July 2012, paragraph 7.12

[13] Ofcom, *Enforcement Guidelines. Ofcom's guidelines for the handling of competition complaints and complaints concerning regulatory rules*, 25 July 2012, paragraph 2.42

criterion to be satisfied for the award of such measures.[14] Whilst we consider that Ofcom has significantly understated the importance of the single transit market and the neighbouring markets that could be adversely affected through anti-competitive conduct on the part of BT, the nature of the very high threshold that must be satisfied to secure interim measures leaves BT's trading partners in am invidious and particularly vulnerable position.

By contrast, were BT subject to a formal *ex ante* SMP obligation, the process for ensuring compliance with that obligation would be considerably simpler and accordingly likely to be capable of addressing anti-competitive conduct on the part of BT more swiftly. It would be open for any trading partner of BT to raise a dispute over compliance with that regulatory obligation; under the revised provisions of sections 185-190 of the Communications Act governing dispute resolution, Ofcom would be obliged to handle and determine that dispute within the statutory timeframe of four months. Ofcom's more general guidance on the timeframes for the resolution of complaints for issues within the scope of the Communications Act is six months.[15]

On the basis of the above, it is difficult to see how, on any objective analysis, it is possible to sustain a finding that competition law alone would be an effective way of addressing potential anti-competitive conduct on the part of BT in future. The non-discrimination obligation currently place has evidently influenced BT's conduct to date. In this regard, Ofcom is simply wrong on the facts when it claims that BT has had 'no regulatory restraint' upon it because a previous charge control was removed. If that is indeed Ofcom's view, it is a startling one since it appears to consider that less intrusive regulatory obligations do not act as a constraint upon the dominant undertaking. What is clear is that the current non-discrimination obligation is a relatively limited form of regulatory intervention that has protected the competitive process, there does not appear to be a good case for its removal and assuming a significant risk of an anti-competitive outcome.

[14] See for example the OFT's decision to award interim measures in favour of Spectron in the London Metal Exchange case; http://www.oft.gov.uk/news-and-updates/press/2006/lme

[15] Ofcom, *Enforcement Guidelines. Ofcom's guidelines for the handling of competition complaints and complaints concerning regulatory rules*, 25 July 2012, paragraph 5.7

5 : Interconnect Circuits

Vodafone agrees with Ofcom's proposed regulation of interconnect circuits. We consider some of the thinking potentially flawed, but given the decline-phase of TDM technology, consider that the status quo should prevail. As termination rates fall, the pricing of interconnect circuits will become more significant, and within the next charge control period Ofcom should carry out analysis as to the best way to regulate in an IP environment.

Vodafone considers that there has always been a moot point around which cost elements should fall within interconnect circuit charges, and which should be considered within the ppm termination / origination payments. Regulation of circuit charges has been given limited focus, because whilst an appreciable sum of money, it has been relatively minor when compared to termination rates. As we move into an environment of pure-LRIC termination rates, this will no longer be the case and interconnect circuit charges will represent a material proportion of the cost of operating an interconnect relationship.

Vodafone considers that in some cases, it is anomalous that interconnect circuits will continue to be charged on a LRIC+ basis. For example, although geographic termination rates are migrating to a pure-LRIC basis, the interconnect circuits which carry the calls will continue to be regulated on an LRIC+ basis. Logically, for a situation of simple exchange of geographic traffic, the terminating CP should also be regulated to charge for interconnect ports on a pure-LRIC basis, with any common costs associated with providing an interconnect facility being borne by their own outbound traffic streams. However, we concede that this is not the case for all interconnect facilities:

- IECs are a facility provided by BT to convey CP traffic from one of their nodes to another. Absent geographic termination (or call origination paid for by the CP), there would be no need for BT to operate such a facility so it appears valid that the CP should pay BT's full cost of provision.

- The portion of circuits used for CPS and IDA call origination are used solely for services purchased by the CP from BT rather than vice versa, so it makes little sense that BT should meet the common costs of provision of these from its own retail customer base.

On the whole, Vodafone's view is that in principle those interconnect facilities associated with services that are supplied on a reciprocal basis should be regulated to have pricing related to pure-LRIC costs, whereas those facilities associated with services purchased solely by the CP from BT should be regulated to have pricing related to LRIC+ or even LRIC++ costs. However, in practicable terms at the moment, such facilities are at times inseparable (e.g. a single interconnect route will carry both CPS originating and geographic terminating traffic). Further, at a time when TDM interconnection has a finite lifetime left, we consider it would be disproportionate to

attempt to construct a suitable cost model. For these reasons Vodafone is supportive of Ofcom's proposals to roll over the existing pricing, with an RPI-RPI charge control, albeit as set out in Section 7.1 we consider an additional cost-orientation obligation would also have been proportionate.

However, Vodafone does not consider that the existing situation will necessarily prevail for much longer. In due course, we expect there to be changes:

- an ongoing general reduction in CPS traffic,
- the move to unbundled tariffs for NGCS meaning that originating CPs should be recovering their costs of provision of such calls from their Access Charge rather than the terminating CP being responsible for meeting the costs (via the OCP retaining some of the retail tariff) and
- a move to IP interconnection necessitating fewer points of connection hence less need for extension circuits.

Taken in combination, these aspects will move the interconnect situation to a more straightforward reciprocal one. Therefore, we consider that by the time this market review process is repeated, it may well be appropriate to have a pure LRIC model available for pricing IP interconnect circuits. Ofcom should use the time of the next charge control period to consider how best to achieve this. .

6 : Comments on the model

Vodafone agrees with much of Ofcom's approach to modelling, for example the usage of pure-LRIC for assessing costs associated with fixed termination, the absence of a glidepath, the usage of NGN technology and the adoption of 50% as a representative fully national fixed operator market share. In this section we highlight issues with the model, notably:

- **The recovery of passive asset costs, where we advance reasons for a lower % mark-up;**
- **The calibration uplift, which we suggest is unnecessary;**
- **The reallocation of the "missing" fixed and common costs notionally applied to termination where we explain that a constant per minute addition to a limited set of services with varying costs is not correct;**
- **Assumptions of asset utilisation**

6.1 INTRODUCTION

Vodafone has attempted to review the Ofcom LRIC and LRIC+ model in a reasonable amount of detail – however because of the truncated timetable, our review has not been to the level of detail that might have been possible with a more typical 12 week consultation timetable. Our comments therefore must be considered somewhat partial – the absence of an expressed view on a particular issue should not be construed as an agreement with that point.

Having said that, however, Vodafone agrees with a considerable proportion of what Ofcom has done in the present consultation with respect to both modelling principles and much of the modelling details, given that to a substantial extent these follow the LRIC and LRIC+ methodology employed in mobile termination rate modelling. Whilst Vodafone has not agreed in the past with some parts of the MTR modelling, as per our appeal against the MTR statement in 2011, it is an undeniable fact that the charge control in place on mobile termination is underpinned by the LRIC output of the final (post appeal) version of the model. It follows therefore that the fixed origination and termination LRIC and LRIC+ model deployed by Ofcom should adopt similar principles to Ofcom's final MTR model. We note that in the Netherlands, both FTR and MTR have been generated from the same generic model. Whilst there are very strong similarities between the UK fixed and mobile models in the economic depreciation calculation engine we note that the network dimensioning components have different authors (CSMG rather than Analysys Mason). This clearly increases the possibility of inconsistency of method and approach.

For reasons primarily of consistency therefore Vodafone supports Ofcom's approach on for example:

- The use of pure LRIC (or merely LRIC) for fixed termination
- The rapid glidepath for fixed termination
- The adoption of 50% as a representative fully national fixed operator market size
- The modelling of NGN rather than TDM network technology
- The use of the same economic depreciation method as in MTR
- The use of routeing factors and busy hour traffic weighting by service to control the allocation of cost recovery (but we have some issues with respect to the detail of time of day charging resulting from the location of the busy hour)

However, where Ofcom adopts an approach for fixed modelling that is different from that which it has employed with respect to mobile, then we believe that such an inconsistency in methodology is *prima facie* presumptively wrong, and can only be made acceptable where the need for a differentiated approach can be clearly and definitively established.

6.2 REGULATION OF BOTH TERMINATION AND ORIGINATION

One aspect that is clearly different in the fixed charge control is that unlike mobile, it is both origination and termination wholesale voice calls that are regulated. A consequence of this is that in the MTR review once the decision to move to LRIC was taken, the level of the LRIC+ charge for MTR became largely irrelevant. This is not the case for fixed regulation, at least in Ofcom's current methodology. Ofcom's approach is that the "gap" between the LRIC+ and LRIC for fixed termination is first defined, and then actively used to identify those fixed and common costs which apparently relate to fixed termination, but because of the EC recommendation are not being recovered from such traffic. Ofcom as an overlay calculation on top of the LRIC and LRIC+ model then seeks to recover those costs from originating and on-net voice pro-rata to volume.

So for example in 2013/14[16] the LRIC+ and LRIC of termination (in 2011/12 terms) are 0.189p and 0.040p per minute, giving a fixed and common costs recovery "shortfall" of 0.149p per minute. The modelled LRIC+ of origination is 0.174p, but when the termination "shortfall" of 0.149p is pro-rata'd across origination and on-net volumes it equates to an further origination uplift of 0.123p[17] per minute, resulting in what might be described not as a LRIC+, but as a LRIC++[18] of origination of 0.297p per minute.

Effectively therefore what is happening under Ofcom's current proposal is that each origination minute is recovering a double lot of fixed and common costs, both its own and those that (nominally) relate to termination. Under these circumstances the level of

[16] Using the Ofcom central case

[17] In effect every minute of origination recovers not only its own fixed and common costs but also 83% (0.123/0.149) of the fixed and common costs of a termination minute

[18] Since origination is recovering both its own fixed and common costs under LRIC+, but also the large part of the + (LRIC+ - LRIC = the +) of termination

LRIC+ for termination (over the level of LRIC) does become relevant since the gap between LRIC+ and LRIC provides a 70% uplift[19] to the suggested regulated charge for origination. Similarly, if the LRIC of origination were to be approximately the same as the LRIC of termination, then at 0.040p a minute, the LRIC++ of origination of 0.297p a minute suggests that 87% of the suggested charge is represented by the double inclusion of fixed and common costs, a mark-up of 640%.

Given this, it is necessary to examine the fixed and common costs that have been modelled as being related to termination as part of the understanding of the size of the LRIC++ of origination.

Given the size of the model and the shortage of the review period, we have confined our observations to four major areas:

- The underpinnings of the LRIC of termination
- The passive asset uplift
- The "calibration adjustment"
- The calculation of the recovery of fixed and common costs from origination

We address these in turn.

[19] From 0.174p to 0.297p

6.3 SOFTWARE LICENSES AS A COST DRIVER FOR CALL TERMINATION

Whilst not explicitly stated, software licenses comprise some 75% of the assessed cost of call termination. Ofcom asserts that the cost of such licenses would vary with traffic levels, but offers no evidence to support this. Vodafone considers this position is at odds with the position adopted for mobile call termination, where various assets were concluded to be driven solely by subscriber numbers.

Ofcom discusses in A12.35 onwards the nature of the assets that the model is identifying as incremental to termination. From A12.39 Ofcom describes one such asset, the call server software licences. What Ofcom does not identify clearly is how significant this particular and somewhat debateable item actually is to the overall LRIC of termination. It is a simple matter to establish this by adjusting the model to allow for a different level of call server software cost being applicable to termination – the results are tabulated below

Outputs in ppm	2013/14	2014/15	2015/16
Termination LRIC	0.040	0.037	0.034
LRIC with only 50% of the call server software Cost treated as incremental	0.025	0.023	0.021
LRIC with no call server software cost treated as incremental	0.010	0.009	0.008

Table 6.3.a : Varying the termination LRIC outputs

It is clear that in fact under Ofcom's central case 75% of the assessed LRIC of termination relates solely to the call server software asset item. This materiality was not explained in the consultation document. Moreover it is not unambiguously clear that any of this cost should be treated as incremental to this service – or in the alternative, that a significantly lesser sum should be so applied. Ofcom's discussion is as follows, and worth quoting in some detail:

> A12.35 We agree with Vodafone that, in principle, it would be useful to identify which assets are incremental to wholesale call termination. However, we can only do this to the extent that there are good reasons for believing that specific assets are incremental to wholesale call termination. We also seek to set the cost drivers in the model, so the costs in the model correctly change as traffic volumes change. When modelling using LRIC+, using the correct cost drivers will mean that costs change correctly as the volume of network traffic changes. Likewise, using the correct cost drivers will mean that when a traffic increment is removed, costs will change appropriately.
>
> A12.39…. In the 2013 NCC model, the CSSLs are subscriber-driven costs and so do not appear as incremental to the incoming termination increment. Based on evidence

> from responses to our information requests, we believe that the number of subscribers is the appropriate cost driver for the deployment of CSSL. **However, we also believe that the value of the licence may change when the call termination increment is removed**.
>
> A12.40 CSSLs are a voice specific intangible asset. Unlike tangible network assets, CSSLs do not have capacity constraints and additional voice traffic (e.g. termination) can be carried at no greater cost. Moreover, CSSLs are a network asset for which there is no substitute input that could serve as a proxy for the value or cost.
>
> A12.41 In light of the above features of CSSL assets, even if CSSLs are typically priced on a per subscriber basis, this does not mean that the value of the CSSL should necessarily be seen as fixed or invariant to traffic. **In particular, the willingness to pay for licences is likely to be driven by the amount of voice traffic generated by subscribers.** Therefore, the value of a CSSL can be thought of as the discounted stream of revenues that the licence can earn. Removing an increment of traffic would then reduce the value of a licence.
>
> A12.42 We have captured this change in the value of the licence by introducing a reduction to the cost of each CSSL. We make the assumption that all voice traffic carries equal weight and so we decrease the unit cost (both capex and opex) of the licence by the ratio of termination traffic to total voice traffic when we remove the call termination increment.

(Vodafone emphasis)

The drivers of this calculation are thus two-fold. Firstly that in the central case, the capital cost of the software licence is £4 per customer (in the base cost year at least). Secondly, when in the world without termination, Ofcom has assumed that this £4 is reduced precisely in the proportion that the volume of termination traffic bears to the total volume of all voice traffic, i.e. on-net, terminating, originating and transit. This proportion is calculated (using total traffic on a long run discounted basis) at 36.8%. The model is thus assuming that in the absence of termination the cost of the software licence would not be £4, but £2.52[20]. In other words, despite the cost being apparently one that has a different cost driver, i.e. a fixed cost per customer, the cost is actually deemed to be entirely variable with traffic – there is under Ofcom's assumption no element of fixed cost at all, e.g. to make the call server software function in the first place – the absence of a particular traffic flow results in a traffic volume related reduction in the software cost. Ofcom must thus be confident that the cost of the call server software is not a non-traffic related cost, but a traffic related one, and also that its long run cost varies directly with the long run volume of traffic that it serves, even when termination is considered as the last traffic increment to have traffic-related costs attributed to it.

[20] £4 * (1 - 36.8%)

Ofcom has produced no evidence as to why either of these must be so – merely a *"we believe that the value of the licence may change when the call termination increment is removed"* and *"the willingness to pay for licences is likely to be driven by the amount of voice traffic generated by subscribers"*[21]. Yet this is precisely the same principle as one of the points Vodafone advanced in the MTR market review and subsequent appeal, that the value/cost of network asset elements would be different in the absence of termination. For example we argued that the value of mobile spectrum licences would change in a world without mobile termination – at the time Ofcom took the view that the cost of such assets would not vary in the presence/absence of termination. Whilst we welcome Ofcom's changed view, it is not clear why it has occurred: we question the consistency of it with Ofcom's view that was strongly expressed in the mobile termination review and appeal[22], and look forward to the consistent incorporation of this revised approach in the next mobile termination review.

6.4 PASSIVE ASSETS

Vodafone considers that Ofcom's treatment of passive assets is flawed. Whilst acknowledging that it is impossible to construct a complete bottom-up model, we consider that using empirical evidence from BT's TDM-based network to determine a passive asset overhead for an NGN-based network is incorrect.

A significant proportion of the fixed and common costs relating to both origination and termination are not modelled directly on a bottom up basis, but are added at a late stage to LRIC+ as a mark-up[23]. Ofcom describes these marked up assets as passive assets:

> "9.21 In addition to NGN specific assets, an NGN will contain assets that could be used by either a TDM network or an NGN. In the September 2012 Consultation, we proposed not to model these shared assets on a bottom-up basis, but rather use the cost of the assets that are currently allocated to NCC services on a top-down basis as a proxy. We have identified 3 types of asset that fall into this category:
>
> - ducts (the conduits through which underground cables are passed);
> - land and buildings (both corporate offices and network buildings); and
> - core transmission used to link exchanges (e.g. Fibre)."

Obviously the failure to model them directly limits the capability of the LRIC+ outputs to be considered wholly as a bottom up view. These mark ups are not insignificant – the percentages adopted are 37.7% for termination and 35.8% for origination. Given these levels, the absolute size of the mark-up in the LRIC+ of termination in 2013/14 of 0.189ppm must be 0.052ppm[24], and that for the 0.174ppm of origination 0.046ppm. Since the fixed and common costs of termination are recovered from origination in the

[21] Quite clearly this implies that a subscriber generates incoming as well as outgoing traffic
[22] E.g. Ofcom Defence Annex B at paragraphs 98, 99, 103 ff, the discussion on voicemail servers, paragraph 148 etc.
[23] In the service costing sheet of workbook 3, after economic depreciation has been calculated and recovered against individual services
[24] 0.189-(0.189/1.377)

ratio 0.123:0.149 or 83%, this means that every minute of origination is being forced to recover 83% of 0.052ppm from termination, plus its own 0.046ppm, or a total of 0.089ppm. With the assessed LRIC++ of origination being 0.297ppm, it is evident that the recovery of the costs of passive assets represents 30% of the total cost of origination – in other words a mark-up of 43%[25] is being applied.

With this level of materiality, it is obviously worth considering the degree to which the passive asset recovery against origination is appropriate. There would appear to be several good reasons as to why the size of the recovery is excessive.

The passive asset recovery seeks to recover against the NGN assets a quantum of costs that is the same as the total that has historically been allocated by BT in its regulatory financial statements to the TDM based regulated services of origination and termination. Since only the output percentage and not the detailed calculation is provided, we have no way of assessing the robustness of this calculation, and whether the recovery of such costs is being spread across on-net traffic as well as off-net originating and terminating traffic, and which year of the RFS is being used to derive the uplift, whether the absolute sum and/or proportion allocated to the regulated voice services has changed over time etc.

Reference to the RFS, section 6 makes it clear that the basis of the recovery of the relevant cost types, i.e. land and buildings, transmission and duct is on relative resource use, in terms of floor space occupancy, activity surveys, usage factors, service volumes etc. across the total services both regulated and unregulated carried by BT. So this is not a fixed cost, but an allocated component of a much greater total, and a proportion of the total that changes as service volumes etc. rise and fall. But NGN is likely to be using lower floor space occupancy and lower level of activity than the TDM equipment – any overall allocation of BT's total costs[26] in these categories using NGN rather than TDM would almost certainly result in a lower absolute quantum of costs being charged to voice origination and termination.

Furthermore the allocation from the total of such costs should not be considered to be a constant % of the overall total, but a dynamic allocation – as voice volumes fall and data volumes rise in relative proportion of total service volumes, the passive cost percentage allocated to voice services will fall.

We would suggest that the observed passive asset mark-up of 43% is both generous, (particularly since origination receives a "double lot" of the mark-up) and somewhere above the ceiling of any recovery that would be calculated in the period of 2013/14 to 2015/16 (the period relevant to the charge control) under the circumstances of an

[25] 1- (0.297/(0.297-0.089))

[26] Or more strictly the costs of an average efficient operator with BT's national reach using NGN rather than TDM

NGN network – a lower overall mark-up of around 30%[27] might be more realistic to be applied during the 3 years of the proposed charge control.

Such an adjustment would give the following outcomes:

Outputs in ppm	2013/14	2014/15	2015/16
Termination LRIC+	0.166	0.157	0.137
Termination LRIC	0.040	0.037	0.034
Implied termination "+"	0.126	0.120	0.103
Origination LRIC+	0.155	0.140	0.127
Add-on from termination	0.103	0.093	0.083
Origination LRIC++	0.258	0.233	0.210

Table 6.4.a: Implication of a lower passive asset mark-up

6.5 RETROSPECTIVE COST RECOVERY ADJUSTMENTS

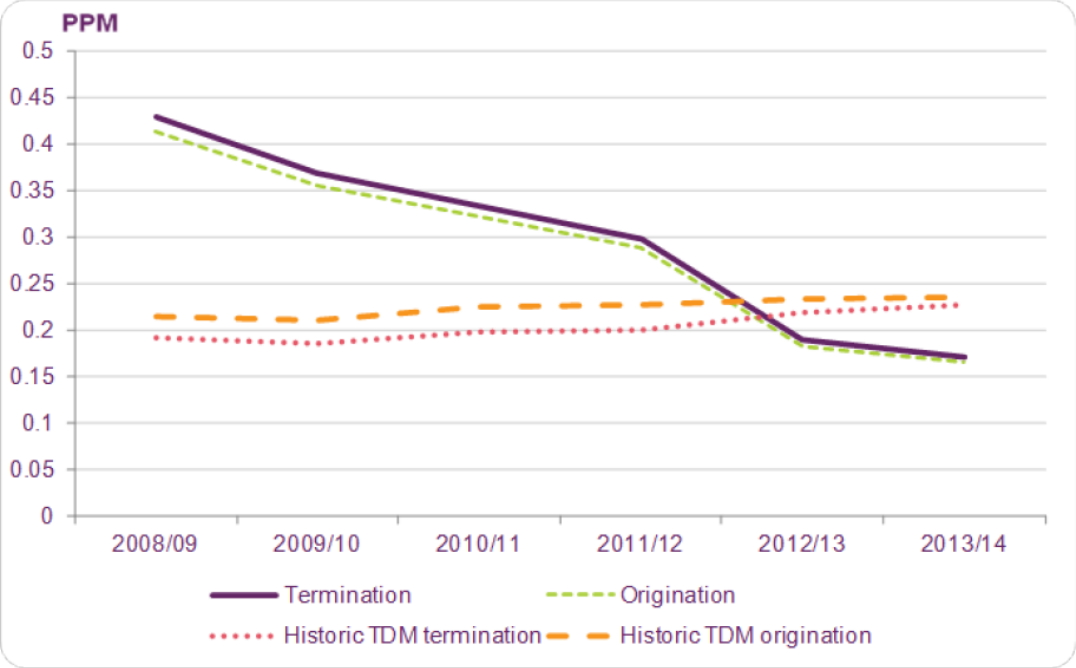
Vodafone agrees the principle that if the model output would have allowed BT to receive greater revenues historically than it has done so, then the future model output should be uplifted to take account of this under-recovery. However, we consider that Ofcom has not compared like-for-like revenues, in that the model output provides what is essentially a mix of interconnect services. Once this is allowed for, there is no need to make any retrospective cost recovery adjustment.

Ofcom establishes the principle in A12.98 onwards that "the model should not recover more costs in historic periods than was possible given the level of regulated charges". To this end Ofcom calculates what BT was able to recover, based on the wholesale revenues and volumes in the RFS, and compares this against the model's outputs for LRIC+ for both origination and termination. Although Ofcom does not make it clear, we assume the RFS recoveries have been restated into 2011/12 terms, to be consistent with the model's inputs and outputs.

Ofcom states that this comparison reveals an apparent under-recovery of actual revenues against the model for the 2007/8 to 2011/12 period for that proportion of the traffic assumed to have been carried on the hypothetical NGN, and a subsequent over-recovery in 2012/13 and 2013/14, as is shown in Ofcom's figure A12.10 below.

[27] Which would be achieved with a modelled 25% passive asset cost mark-up for each of origination and termination – this is easily achieved by adjusting the values on the input_network sheet of workbook 2.

Figure A12.10: Comparison of model outputs against BT RFS prices[704]



This estimation is then used to derive a forward looking calibration uplift for future periods. The PV of the net under-recovery is derived on a ppm basis, and then used to uplift the initial model outputs on a constant unit basis from 2013/14 onwards. For Ofcom's central scenario, these uplifts are 0.026ppm for termination, and 0.017ppm for origination. But since these uplifts are applied to the LRIC+ of termination and origination, in practice these are both recovered from the LRIC++ of origination only: a total, after applying the termination/origination recovery ratio per unit of 83%, of around 0.039ppm.

We agree with the logic of calibration adjustments. Moreover we do not fundamentally disagree with the general principle of calculating a calibration recovery adjustment based on the difference between what an operator could have recovered in a TDM world in the historic period and that which the model is suggesting might have been recovered in the same period in a NGN world, providing like with like is being compared. However we do not believe that Ofcom's computation of the future calibration adjustment is correct.

Whilst we have been able to more or less reproduce the historic TDM regulated values from the above chart (and supplied in workbook 3 of the model) for termination, we cannot reach the numbers used for origination – the RFS output, once adjusted for RPI, would appear to give a set of values higher than those quoted by Ofcom, in order to maintain the origination/termination premium shown in the RFS. On the face of it, given that the RPI-X formulation of both origination and termination have been virtually the same, the two dotted lines in figure A12.10 above should move in step, with origination at least 0.025ppm higher[28] - but the figure appears to show the two dotted

[28] From the published BT wholesale rates for call origination and termination local exchange after application of the network tariff gradient

lines converging, which seems implausible. Higher values of imputed historic origination recoveries will obviously give a lower value to the future LRIC++ of origination.

But there are other issues with this calculation. In the first place, some of the extent of the NGN model's apparent high level of recovery in the past relates to the high passive asset mark-up that Ofcom has applied. Reducing the passive asset mark-up to the more reasonable levels suggested by Vodafone above will considerably narrow the gap between the theoretical past and actual historic recoveries.

In the second place Ofcom is not comparing like-with-like between TDM recoveries and NGN recoveries, particularly with termination. Ofcom has defined NGN regulated termination to include transit across the core network from the point of interconnection, for all national and international off-net originating traffic. So in 2013/14, 30.5 billion minutes are assumed to be national cross core, and only 4.5 billion minutes are treated as making use of only a single aggregation node, with a further 3.8 billion minutes assumed to be international in origin, also passing across the core.

This is very different from the actual TDM recoveries, since here it is only the last leg of the call, the "call termination local exchange segment" that is regulated, and that is being included in the historical charge calculation above. However a call that passes over a more extensive part of the TDM network will also have attracted further charges for such services as local tandem conveyance and inter-tandem conveyance short, medium and long. There are no equivalent services being assumed in the NGN model, where the entire route from any one of the 20 points of interconnect to the end user is considered to be termination, irrespective of whether this means transporting the call across the core network. In fact the model's split of traffic assumes that a very high proportion of traffic passes across the core – the model is in effect assuming that there is no distance related or local element of calling[29].

The model's calculation of the LRIC+ and the LRIC of termination is in fact the weighted average of three services:

- off net incoming national calls (single aggregation node) – this is unsurprisingly the service with the lowest cost, and represents 12% of the national calls
- off net incoming national calls (national cross core) – this attracts a 6-7% cost recovery premium, and represents 88% of the national calls
- off net incoming international calls – this attracts a 3-4% cost premium, and represents a further 10% incoming traffic on top of the total of national incoming calls

In order to properly compare the theoretical historic NGN cost recoveries against what the real historic TDM cost recoveries could have been under the same routeing mix, a similar split of traffic routing needs to be assumed. In other words the notional potential

[29] The overall call distribution 20% single aggregation node 80% national cross core in the input network sheet of worksheet 2 is defined by the ratio of aggregation nodes, 106, to points of interconnect, 20. This effectively implies an even distribution of callers across the UK matched with an even distribution of recipients, i.e. a caller in Cornwall is equally likely to call someone in Caithness as someone in Cornwall. This is clearly not correct.

historic TDM recoveries need to include not only the local exchange segment charge but also some component of the local tandem and inter tandem conveyance charges.

We know that the rates for these services, after applying the network tariff gradient, were:

- local tandem conveyance – 0.079p
- inter tandem conveyance short – 0.171p
- inter tandem conveyance medium – 0.290p
- inter tandem conveyance long – 0.455p

These rates then need to be translated into the 2011/12 prices of the model – so, similarly to the calculation Ofcom has already made for the local exchange segment, prices need to be tilted up into the past. We have not performed this calculation on a detailed basis, but with a representative mix of inter tandem conveyance traffic similar to the equivalent assumed in the NGN routeing, and in view of the fact that in figure A12.10 above the assessed TDM/NGN "gap" is no more than 0.24p even in 2008/09, when traffic levels are low, but is much lower in subsequent years, we believe that such a calculation made on a like-for-like traffic routeing basis would show that there is no need at all for a forward looking calibration adjustment for termination, or similarly for origination.

Removing this unnecessary calibration uplift would give the following outputs, (when the passive asset mark-up is maintained at Ofcom's modelled levels):

Outputs in ppm	2013/14	2014/15	2015/16
Termination LRIC+	0.164	0.147	0.132
Termination LRIC	0.040	0.037	0.034
Implied termination "+"	0.124	0.110	0.098
Origination LRIC+	0.157	0.141	0.127
Add-on from termination	0.101	0.090	0.079
Origination LRIC++	0.258	0.231	0.206

Table 6.5.a: Removing the calibration uplift

6.6 BUSY HOUR DIMENSIONING

Vodafone notes that the model's treatment of busy hour dimensioning supports our position that there is no need to support time-of-day interconnect charging.

Examination of the model shows that Ofcom appears to be correctly recovering costs from services in relation to the intensity of each service's demand for resources, i.e. in relation to the local network busy hour. This is generally the overall network busy hour, which is modelled, given the balance between voice and data and the varying busy hours per service and customer segment, as in the evening period. Under these circumstances the logic for preserving a wholesale time of day structure that has a peak charge in the daytime appears counterintuitive – the logic of using different time of day rates must be that a lower rate in a non-peak period may be of help to steer traffic away from the network peak, improving the peak/average traffic ratio on the network, and driving down the average costs of all services.

Given that the peak/off peak structure of prices originated when the network busy hour coincided with the peak charge and may have been appropriate at that time, but that the wholesale pricing structure has not changed in response to traffic changes, i.e. a shift in the network busy hour, it would appear that regulatory intervention is necessary to eliminate this price discrimination. We address this matter in more detail elsewhere in this document.

6.7 ASSET UTILISATION

Vodafone considers that Ofcom has been too conservative in adopting a utilisation assumption of 70%, and that 80% would be more appropriate.

In paragraphs 7.26 and 7.27 of annex 13 there is a brief discussion on asset utilisation, where it is noted that one operator has suggested that 80% might be a more representative maximum asset utilisation value, and that the 70% has emerged from Ofcom's information request. Whilst clearly discussion of maximum utilisation values in a hypothetical national NGN operator is a little difficult, we wish to make two points.

Firstly 70% is below the level that Ofcom has assumed for an averagely efficient mobile network where 80% was the norm, and 90% not unusual. Indeed Ofcom said in support of its 90% utilisation assumption for voicemail servers in Annex B of its Defence at paragraph 89:

> "Ofcom's estimate of 90% utilisation for voicemail servers is an input assumption that takes into account an allowance for under-utilisation of assets in practical deployments. This 90% figure represents the assumed utilisation during the network busy hour… Ofcom notes that a 90% utilisation factor is also used for other asset types, for example

> microcells, picocells and 2G BSC-PCU… Ofcom submits that 90% is not an atypically large utilisation assumption for a network asset".

So is it to be assumed that the average efficient fixed network, where traffic volumes are less dynamically variant than in mobile, can be reasonably expected to need a utilisation headroom significantly greater than mobile?

Secondly, the way that the fixed network model is built inherently suggests a high utilisation factor. Rather than treat each node type as a single asset, the model builds up nodes from multiple asset components. For example the BA node is not modelled as one asset, but as 13 component parts, each of which are individually dimensioned and modelled. In this way, rather than installing a one size fits all BA node at every location, which would obviously imply significantly and potentially inefficiently varying utilisation levels across the population of BA nodes as a result of the varying traffic per node, the model is in effect tailoring the size of each individual BA node in terms of the volume of line cards and other components to support the local demand. This suggests that high levels of network utilisation will be achievable.

Vodafone doubts therefore whether 70% utilisation, i.e. allowing for headroom of over 40% above the busy hour peak, is an appropriate value to use[30] for NGN. If the model were to adopt an 80% utilisation, the results would be as follows:

Outputs in ppm	2013/14	2014/15	2015/16
Termination LRIC+	0.176	0.161	0.146
Termination LRIC	0.036	0.033	0.030
Implied termination "+"	0.140	0.128	0.116
Origination LRIC+	0.162	0.147	0.133
Add-on from termination	0.115	0.104	0.094
Origination LRIC++	0.277	0.251	0.227

Table 6.7.a: Increasing the utilisation to 80%

[30] In fact some asset elements use a 58% utilisation assumption

6.8 APPLICATION OF LRIC++ COST RECOVERY TO ORIGINATION

Vodafone considers Ofcom's approach to recovering common costs that are displaced from call termination via origination to be flawed. Whilst we agree with the general principle, we consider a blanket mark-up on call origination minutes is incorrect. At the very least, the displaced costs should be recovered pro-rata according to the cost of the origination minutes rather than being a flat fee. We also consider that recovery across transit minutes is valid too. An alternative approach would be to re-run the LRIC+ model for all services excepting termination, i.e. delivering an LRIC+EMPU output.

Having established the LRIC+ of both termination and origination, and the LRIC of termination, then as a final calculation, Ofcom as described above derives the LRIC++ of origination, which is then applied in the proposed charge control.

The method is quite simple, and merely an overlay on to the basic LRIC and LRIC+ calculation, rather than being an integral part of it. The fixed and common costs nominally relating to termination are identified on a per minute basis from the differential between the LRIC+ and LRIC ppm rates of termination in each year, and are multiplied up by the termination volume for that year to identify the total cost that is now "unrecovered" and is to be recovered by other means, and this cost is then divided by the total volume of originating traffic, both off-net and on-net, to derive the recovery per minute that is required to be added to every originating minute to uplift origination from LRIC+ to LRIC++. However there are detailed errors in the way in which this LRIC++ is calculated.

The first is a simple Excel referencing error, which we understand Ofcom is already aware of. In the final outputs sheet of workbook 3, the model collects the traffic volumes and LRIC+ outputs from the service costing sheet in order to translate them from the years beginning at the 1st April, that the model uses, into the charge control years beginning at the 1st October. This is simply accomplished – the charge control year 1st October 2013 to 30th September 2014 is quite straightforwardly the product of half of each of the model years 2013/14 and 2014/15. In picking up the volumes for these years to derive charge control year values, the final outputs sheet picks up named ranges entitled *vol_term* for the termination volume, and *vol_orig* and *orig_all* for originating traffic – the latter includes on-net traffic volumes. However there is a referencing error for *vol_term*, in that instead of referring to the 4 years from 2013/14 onwards, it actually picks up the years commencing 2012/13, and places 2012/13's volumes into 2013/14 for the weighting calculation, and similarly displaces all subsequent years. Since the volumes of termination are falling, this means that in practice in each of the charge control years the notional fixed and common costs relating to termination are overstated, and hence the uplift applied to each origination minute is overstated.

This error is easily corrected – it gives the following results, when using the model outputs from Ofcom's central case:

Outputs in ppm	2013/14	2014/15	2015/16
Termination LRIC+	0.189	0.173	0.158
Termination LRIC	0.040	0.037	0.034
Implied termination "+"	0.149	0.136	0.124
Origination LRIC+	0.174	0.159	0.144
Add-on from termination Ofcom original	0.123	0.111	0.100
Origination LRIC++	0.297	0.270	0.244
Add-on from termination revised	0.118	0.107	0.098
Origination LRIC++ revised	0.292	0.266	0.242

Table 6.8.a: Correcting for the referencing error on LRIC++

Clearly the change is merely trivial. However there are other more significant considerations with reference to the approach used by Ofcom.

What Ofcom is obviously attempting to do is to mark-up the LRIC+ of origination to absorb the "missing" and unrecovered total of fixed and common costs allocated by the model to termination, across all origination traffic, both off-net and on-net. But Ofcom has chosen in error to do this pro-rata to the *volume* of origination traffic. This makes no sense – such a mark-up should be applied pro-rata to the underlying *cost* of the traffic. This is exactly what Ofcom has done in applying the passive asset mark-up, which has been expressed as a percentage uplift on the cost before mark-up, rather than as a constant amount across all services receiving the same uplift (and thus gives a different absolute level of mark-up for the three different termination services that are modelled).

The "termination common cost mark-up" is actually being applied across five different origination traffic services. It can be readily seen from the model that each of them has a different modelled cost – so for example in 2013/14, the model shows a service cost including the passive asset mark-up of:

- On-net single aggregation node 0.210p
- On-net cross core 0.217p
- Off-net outgoing national single aggregation node 0.157p
- Off-net outgoing national cross core 0.167p
- Off-net outgoing international 0.164p

It is obvious given this variation that the mark-up should be applied as a percentage pro-rata to the varying underlying cost, rather than as an absolute constant sum per minute across all services.

There is a small complication in calculating this since Ofcom has applied the forward looking calibration adjustment referred to above only to off-net and not attempted to calculate a similar uplift that could be similarly applied to on-net traffic. The simple way round this difficulty is to calculate the quantum of the necessary fixed and common cost shortfall from termination as an annual sum[31] as normal but to recover this across the total cost of all outgoing services before the calibration uplift – i.e. from the "service cost including the passive asset mark-up" as given above. This will provide in each year a constant % mark-up across all five services. Accomplishing this is straightforward. The results are as follows:

Outputs in ppm	2013/14	2014/15	2015/16
Origination LRIC+	0.174	0.159	0.144
Add-on from termination Ofcom original	0.123	0.111	0.100
Origination LRIC++	0.297	0.270	0.244
Add-on from termination revised	0.100	0.091	0.084
Origination LRIC++ revised	0.274	0.250	0.228

Table 6.8.b: applying mark-up pro-rata to origination cost, not volume

But this is not the end of the matter. We noted above in connection with the voice call server software that Ofcom identified the resource applied to terminating traffic with reference to a pro-rata calculation against all voice traffic, including transit traffic. Vodafone considers that it makes little sense for transit voice traffic not to bear some element of the fixed and common costs unrecovered from termination, pro-rata to the underlying costs of each of these services.

Since in the model Ofcom does not apply a passive asset uplift to transit traffic, we have computed one at the average of that applied for on-net, terminating and originating voice services, i.e. 36.76%. Spreading the unrecovered fixed and common costs across all voice services other than termination yields the following outputs:

[31] (LRIC+ minus LRIC) multiplied by annual volume of termination traffic

Outputs in ppm	2013/14	2014/15	2015/16
Origination LRIC+	0.174	0.159	0.144
Add-on from termination Ofcom original	0.123	0.111	0.100
Origination LRIC++	0.297	0.270	0.244
Add-on from termination revised	0.082	0.074	0.068
Origination LRIC++ revised	0.256	0.233	0.212

Table 6.8.c: recovering costs pro-rata to origination and transit

Finally, Ofcom's calculation and Vodafone's adjustments to it are made under the assumption that it is both possible and correct to identify a notional volume of fixed and common costs that are "properly" allocated to termination services but that cannot be recovered from such services, and accordingly the overlay calculation recovers them from other specific services – in Ofcom's interpretation against outbound voice services, and in Vodafone's approach across all other voice services, i.e. not only outbound voice services but also transit voice services.

But there is some circularity in the logic being applied by Ofcom. The fundamental reason why there has been a shift from LRIC+ to LRIC for termination is the EC Recommendation that voice termination services should not attract fixed and common cost recovery. Irrespective of Vodafone's view of the correctness of this approach with respect to mobile termination, once the decision has been taken that termination voice services should not attract any fixed and common costs, there is some inconsistency in applying this approach but at the same time calculating the quantum of fixed and common costs that "should" relate to termination and forcing that recovery onto particular services.

An alternative approach would be to simply recover fixed and common costs pro-rata to all services except termination, i.e. a LRIC+ EPMU approach. This could be easily achieved by running the model without termination, and letting it apply the total of network fixed and common costs across all remaining modelled services, both voice and data without attempting to force some costs into particular services. This would generate a proper LRIC+ of origination, rather than the somewhat artificial overlay construct of a LRIC++ of origination, that Ofcom is attempting to apply.

Ofcom's approach to fixed and common cost recovery as applied in the model has significantly departed from EPMU principles. Rather it appears to consider that some services (this this instance voice or a partial sub-set of voice services) should recover more common costs than others (such as data and certain excluded voice services). We are not fundamentally opposed to this principle of a non EPMU mark-up – indeed it

is something that we have attempted to apply in the past – but there must be valid applications of this approach in other contexts than fixed narrowband.

We have not attempted to model an EPMU LRIC+ output of all services excluding voice termination, but it would not be difficult for Ofcom to do so. Clearly given the rising preponderance of data traffic, a fully EPMU calculation of fixed and common cost absorption would result in a significantly lower level for the charge for origination (being LRIC+ rather than LRIC++) than that Ofcom has presently calculated. We suggest that Ofcom performs such a calculation – if nothing else it will illustrate the range of alternatives available for the setting of the regulated origination charge.

6.9 CONCLUSIONS

There are thus four areas in which Vodafone has suggested amendments to the modelling approach:

- The recovery of passive assets, where we have advanced reasons for a lower % mark-up;
- The calibration uplift, which we suggest is unnecessary;
- The reallocation of the "missing" fixed and common costs notionally applied to termination where we have pointed out that a constant per minute addition to a limited set of services with varying costs is not correct;
- Asset utilisation

The sections above have evaluated these changes independently as variations from Ofcom's central case. But when considering them as cumulative changes, the following results are obtained.

First, the termination LRIC+ and LRIC need to be revised for both the lower passive asset mark-up, the removal of the calibration adjustment and the increase of network asset utilisation to 80%, and then the implied termination "+" calculated – the termination LRIC only changes from the utilisation adjustment. These adjustments give the following results:

Termination LRIC +	2013/14	2014/15	2015/16
Ofcom original	**0.189**	**0.173**	**0.158**
Lower passive asset mark-up	0.166	0.151	0.137
Remove calibration adjustment	0.149	0.134	0.120
Change utilisation %	0.141	0.127	0.114
Revised termination LRIC+	**0.141**	**0.127**	**0.114**
Termination LRIC original	**0.040**	**0.037**	**0.034**
LRIC with revised utilisation	**0.036**	**0.033**	**0.030**
Revised implied termination "+"	0.105	0.094	0.084

Table 6.9.a: Vodafone revisions to the LRIC+ of termination

Secondly the origination LRIC+ needs to be similarly revised.

Origination LRIC +	2013/14	2014/15	2015/16
Ofcom original	**0.174**	**0.159**	**0.144**
Lower passive asset mark-up	0.155	0.140	0.127
Remove calibration adjustment	0.145	0.130	0.117
Change utilisation %	0.138	0.124	0.111
Revised origination LRIC+	**0.138**	**0.124**	**0.111**

Table 6.9.b: Vodafone revisions to the LRIC+ of origination

Finally the changed origination mark-up from LRIC+ to LRIC++ can be computed, from the revised LRIC+ of origination and "+" of termination, using a mark-up of a constant percentage across all origination and transit services[32]. This has the following results.

Origination LRIC ++	2013/14	2014/15	2015/16
Revised origination LRIC+	**0.138**	**0.124**	**0.111**
Revised termination implied "+"	0.105	0.094	0.084
Revised origination uplift	0.060	0.053	0.047
Revised origination LRIC++	**0.195**	**0.176**	**0.157**

Table 6.9.c: Vodafone revisions to the LRIC++ of origination

[32] Marking up transit services as before with the average passive assets mark-up, now of 25%

Overall therefore, Vodafone's calculations thus give a slightly changed termination LRIC and a revised origination LRIC++ as follows:

Outputs in ppm	2013/14	2014/15	2015/16
Ofcom termination LRIC	**0.040**	**0.037**	**0.034**
Vodafone termination LRIC	**0.036**	**0.033**	**0.030**
Ofcom origination LRIC+	0.174	0.159	0.144
Ofcom origination LRIC++	**0.297**	**0.270**	**0.244**
Vodafone origination LRIC+	0.138	0.124	0.111
Vodafone origination LRIC++	**0.195**	**0.176**	**0.157**

Table 6.9.d: Final impact of Vodafone revisions

Any such origination LRIC++ would have a consistent downward direction for the charge control, rather than the varied both positive and negative values of X indicated by Ofcom's proposed fluctuating value of the origination charge control. We discuss elsewhere issues arising from having both positive and negative X values for origination in the proposed charge control.

7 : Remedies

7.1 COST ORIENTATION VERSUS CHARGE CONTROLS

Where SMP remedies are based on a theoretical cost model rather than BT's actual costs, it is not appropriate to retain the existing cost orientation obligations. However, cost orientation has an important role to play in relation to BT and in particular for interconnect specific services we believe that such a remedy should have been imposed.

We recognise that by moving away from using BT's actual costs to derive call termination and call origination charges it means it would no longer be appropriate to continue to impose the existing cost orientation obligation, which itself refers to actual costs. Furthermore, where charge controls or baskets are placed on single services, as in the case of call origination and termination, the cost orientation obligation is less important. We have consistently argued that in other markets which are still reliant on using BT's underlying costs to set charges, cost orientation as it is understood in the fixed context (i.e. DSAC, DLRIC etc) is a valuable tool that should be preserved as it is very important that the prices of BT's regulated services are aligned with cost. It is therefore important to maintain the availability of accurate cost accounting information to ensure that both remedies complement each other.

In the narrowband market we see the continued need to maintain a cost orientation remedy where the end pricing is still derived from BT's cost base, such as in the case of interconnect specific services. We do not believe that any form of charge control or protective sub caps are an adequate substitute and we would urge Ofcom to retain a basis of charges condition on these services. There are a number of reasons for maintaining a cost orientation remedy in these areas:

a) Charge controls, sub-baskets and or sub-caps are not capable of ensuring that all prices remain aligned with cost over time;

b) Accurate cost information is important for a variety of reasons including setting future pricing / charge controls, ensuring individual prices are aligned with cost;

c) Ofcom's justification for the removing the condition on interconnect specific services is weak. The obligation is not an onerous one, indeed it is a base level safeguard designed to ensure that the pricing does not move out of line with the underlying cost or provision on key SMP services;

Cost orientation as an obligation on BT has overarching benefits that are not evident in other remedies, thus giving other Communications Providers confidence that the price they pay for each regulated wholesale service they need to purchase is fair, and they have the ability to challenge those prices if they believe they are not. Vodafone considers that it is very important that the price of regulated services provided by BT are aligned with cost and the importance of these remedies goes much further than providing a constraint against excessive charging. Today, the cost orientation

obligation sets the upper and lower bounds of what charges should apply, loosely replicating the workings of a competitive market. While charge controls go further and push the efficiency envelope in order to better replicate a well-functioning market, they are not a substitute for cost orientation, which remains the ultimate safeguard for consumers. In the case of interconnect specific services Ofcom is proposing a simple price cap, which does not prevent pricing moving out of line with costs and safeguarding against BT over recovering.

In the Cable&Wireless Worldwide August 2012 response to the BCMR and Leased Line charge Control[33] we set out in detail why we believe it is important to preserve cost orientation as a regulatory tool operating in parallel to a charge control obligation. We will not repeat those arguments here, but we would draw Ofcom's attention to them. We remain of the view that Ofcom should maintain a cost orientation obligation in respect of interconnect specific services. Both the cost orientation and cost accounting obligations should be retained on these services to ensure that the pricing of these bottleneck services is still linked to the cost of provision and that any scope for over-recovery is minimised.

7.2 RECOVERY OF DISPLACED COMMON COSTS

Vodafone supports the recovery of displaced common costs from call origination fees, both retail and regulated wholesale. However we consider that a qualification to this may need to be made in the short-term for NGCS calls to avoid excessive disruption to NGCS pricing in the interval before the introduction of the radical change of NGCS unbundling .

The *quid pro quo* of regulating termination rates to be pure-LRIC is that the common costs which would have been borne by call termination in an LRIC+ approach need to be met from somewhere else. Vodafone agrees with Ofcom's analysis that it would be incorrect to move these onto regulated line rental, as it would suggest that WLR is paying for network costs beyond the demarcation point of the customer linecard. There are also practical organisational considerations which reflect network structure, in that WLR is an Openreach capability, whereas call carriage is a BT Wholesale one…so having a levy on WLR would imply payments from Openreach to Wholesale. Therefore, we agree that these costs once properly calculated should be borne from call services, which in the case of BT covers both retail calls, wholesale call origination and voice transit.

However, as discussed earlier, there is a particular problem with NGCS. The circumstances surrounding NGCS are unique, in that the services are subject to two parallel regulatory initiatives. As the Narrowband Market Review and Review of NGCS are not synchronised, increases to regulated call origination fees would be "locked in" as NGCS subsequently moved to unbundled retail charging, even if they would subsequently have fallen. Vodafone considers that the best approach would be to exclude NGCS from the changes in the narrowband review, freezing call origination fees until the implementation of the unbundled solution, failing which the model

[33] http://stakeholders.ofcom.org.uk/binaries/consultations/llcc-2012/responses/CWW.pdf

modifications we set out in Section 6 would limit the impact. However, if neither of these proposals are adopted, at the very least we believe that because of the transitional nature of the situation it is inappropriate that regulated NGCS origination fees meet all of the displaced common costs, and hence consider that regulated NGCS fees could be temporarily excluded from LRIC++ costing.

In this situation, in the case of NGCS call origination fees prior to the introduction of the new unbundled tariff regime, this would imply that rather than being regulated on a LRIC++ basis, the cost model would remain on a LRIC+ basis, i.e. picking up recovery of its own share of common costs only.

Treating NGCS calls in the interim in this way would imply the further recovery would be solely across originating communications providers' retail geographic calls, and in the case of BT across CPS/IDA origination as well. However, it would mean that call origination to NGCS would not incur the additional costs. This means that the displaced common costs would be recovered across fewer minutes, i.e. that the ppm displacement onto CPS would be higher: this said, CPSOs would benefit from lower geographic termination rates.

We would stress that this proposal is very much for the interim period until unbundled NGCS tariffs are introduced: once they are, it would be for originating CPs to determine how to distribute the common costs displaced from call termination across their unregulated retail tariffs[34].

In any event, as we have argued in Section 6.8 above, the recovery of common costs displaced from termination should be applied pro-rata to the underlying individual (route dependant) service cost before mark-up, rather than as an absolute flat-rate mark-up across all minutes. This principle applies equally to NGCS should Ofcom continue with its proposals to regulate on a LRIC++ basis.

7.3 TRANSITION FROM LRIC+ TO PURE-LRIC REGIME

Vodafone supports not permitting a glidepath and migrating immediately to the new pure-LRIC regime. However, in order not to provide confusing pricing signals to retail customers, we propose a solution whereby BT are able to recover their wholesale call origination costs across the charge control period but with more consistent pricing signals.

There are no compelling arguments to justify anything other than an immediate transition to pure-LRIC-based charging of terminating geographic calls. The European Commission recommendation was clear that the new regime be introduced by the end of 2012, and the regulation of mobile call termination already reflects this. It would be wholly incorrect for mobile CPs to be compelled to purchase fixed termination at LRIC+

[34] In the case of BT, a regulated portion of displaced common costs would fall onto CPS. It would then be a commercial matter for BT how they distributed the remainder of the common costs across their retail tariffs.

prices, while only being permitted to charge LRIC in the reverse direction. CPs have been fully aware of the Commission recommendation for years, so it can come as no surprise that this be reflected into UK regulation in 2013.

A glidepath was allowed in the mobile sector, but the situation differed markedly from that for geographic call termination. Firstly, there was time to provide a glidepath and still be compliant with the Commission's wishes: for geographic call termination, there is not. Secondly, as the recommendation was hot off the presses, stakeholders had not had time to digest its contents and fully understand its ramifications: for geographic call termination, three years have now elapsed. Thirdly, the mobile termination rate revenues were material against the total revenue for mobile services: for geographic call termination, this is not the case. Therefore, Ofcom should dismiss any suggestion of deferring the introduction of regulating fixed call termination at pure-LRIC charges.

Vodafone does, however, have some concerns about the way in which Ofcom's proposals will potentially send confusing pricing signals to retail customers. As described above, we consider it correct that the recovery of common costs that are displaced from call termination be borne by call origination, and this includes CPS. However, unless Ofcom takes account of the flaws in the model we have raised in Section 6, the nature of the proposed regulation will result in a step change upwards, followed by a gradual reduction in CPS origination minutes. Across the proposed charge control, in nominal terms CPS-origination rates will be 18% higher, then 9% higher, finally returning to current pricing. Although some calls (i.e. off-net to UK geographic numbers) will see a reduction in termination rates, it is inevitable that intense competition will see the higher origination payments passed onto retail customers: there simply isn't the margin for CPs utilising CPS to absorb them. We believe that a price increase followed by subsequent pricing decreases will be a confusing message to convey to retail customers. This confusion could be market disrupting, in that WLR-based customers could be incentivised to move to an LLU-based operator (who would have no such overt change in interconnect payments), only to see the pricing reversed in subsequent years.

Therefore, Vodafone suggests an alternate approach. Rather than having an increase followed by decreases, we propose that in the event that the model output remains at the current proposals, BT be allowed to receive the same overall revenues across the charge control period, but on a stable pricing basis. Absent borrowing costs, rather than a charge control of RPI+18.4%, RPI-9.6%, RPI-9.6%, this would result in a charge control of approximately RPI+7.4%, RPI-0%, RPI-0%. When compared to the proposed charge control, this would mean that BT would notionally under-recover in year one of the charge control period, and over-recover in year three. Vodafone is entirely comfortable with an accommodation being reached whereby the cost of BT financing that first year shortfall would be built into the cost stack[35]. We further recognise that a significant change in call volumes between years one and three could disrupt BT's ability to recover: however this could be accommodated into the

[35] We estimate the shortfall to be approximately 9.3% of annual call origination revenues that would have been recovered in year one will actually be recovered in year three. Financing this at BT's WACC would imply an increase in the charge control of ~1.5%, i.e. year one ~RPI+9%.

subsequent charge control period or by incorporating a modifier into the year three calculation.

By taking this approach, Ofcom would be acting squarely in the consumer interest by allowing pricing certainty and avoiding= the bizarre situation of a price increasing then decreasing by nearly 20% within the charge control period. Such an outcome is both detrimental to consumer confidence and entirely avoidable.

It may be argued that this represents a glidepath for CPs that consume CPS, and therefore counter to the approach taken in the review of not allowing such glidepaths. This is adamantly not the case. A glidepath represents a "grace period" for those being regulated to gradually transition to a new approach. So in effect, a glidepath allows over-recovery (or under-recovery) when compared to the economically efficient network by allowing the CP to "hold on" to some of the inefficiency allowed by the outgoing regulatory pricing model. Our proposal allows no such over/under-recovery: across the charge control period, *ceteris paribus* BT will receive exactly the same revenues as under the current proposal and 'CPS-CPs' will pay exactly the same. What differs is the approach allows pricing stability by changing the phasing of these revenues. Vodafone urges Ofcom to give this approach due consideration, keeping in mind that it is entirely consistent with the European Commission recommendation.

7.4 TIME OF DAY CHARGING

Vodafone profoundly disagrees with the conclusion that terminating CPs be allowed the flexibility to charge wholesale rates based upon time of day. The regime means we pay some [✂] **more for geographic call termination than we would do with a 24 hour rate, and in effect means our customers subsidise those CPs with a residential user base. The reduction in termination rates means there can be no justification for this to continue under the logic of price/demand elasticity.**

Vodafone is extremely disappointed that Ofcom has chosen to allow terminating CPs, in particular BT, to vary their rates for wholesale call termination according to time of day. In our response to the Call for Inputs, we highlighted that since the network tariff gradient is *de facto* linked to BT's retail pricing, this meant that one of our main cost items is driven by our competitor's retail pricing policy. It cannot be conducive to effective competition for the cost base hence retail tariffs of one CP to be driven by the retail pricing policy of another.

We concede that BT has not implemented pricing policies such as the flip-flopping which occurred in mobile call termination: however just because flexibility has not been abused to date, does not mean it will be so in the future.

The calculation of the network tariff gradient is widely accepted as broken. The outcome has not varied in over a decade, and it seems inconceivable that the split of

daytime versus evening versus weekend traffic has not varied in this time. Against that backdrop, we cannot help but be suspicious of whether, regardless of Ofcom audits, BT is on average recovering more than the 24 hour regulated rate on call termination.

We understand that Ofcom found the arguments for retention of Time of Day charging finely balanced, and was won over by those stakeholders who would have suffered financially were a 24 hour rate to be introduced[36]. Therefore, we must put the counterpoint that being a CP that serves UK businesses, Vodafone and its acquired CPs such as Cable&Wireless Worldwide, Energis and Thus have been consistently disadvantaged over the last two decades by the Time of Day regime. This represents an overpayment of some [✂] versus a 24hr regime, and at March 2013 rates, this means an overpayment of [✂] per year. We do have a minor compensation in that we benefit for termination to our own geographic numbers, but even allowing for this net we pay [✂] per year more than we would do under a 24hr regime. To compound this, we also pay more for CPS origination than we would otherwise do so: this adds [✂] per year to the bill.

The absolute payment figures for geographic call termination will, of course, fall following the introduction of the pure-LRIC regime. However, this serves to highlight the madness of the argument that Time of Day charging for wholesale interconnection is necessary to modify demand and incentivise calling out of the peak hour. We estimate that the difference between daytime and evening rates for geographic call termination, based on today's network tariff gradient, will be approximately 0.035ppm. Even if this difference was passed through transparently to retail customers, could it be seriously suggested that anyone would defer calling until the evening period to save 2p on an hour long call? Of course not.

As CPs migrate to NGN technology, the concept of time of day charging becomes even more flawed. If there was an argument to modify demand and encourage calling at quieter times, then the most expensive rates would apply at the network busy hour. But they don't: Ofcom's modelling, based on data obtained by legally sanctioned Information Requests, suggests that a reference efficient network would have a network busy hour which falls in the evening period. Whilst it's true that the voice network busy hour falls during the daytime, much of the cost within the pure-LRIC calculation relate to transport elements which are shared with other services. Much of those costs that do relate directly to voice elements – for example software licenses – clearly cannot vary in cost on a time-of-day basis.

Vodafone urges Ofcom to think again on this issue. Allowing the retention of Time of Day charging represents an economically inefficient anachronism of penalising those customers who make calls during the day, causing cross-subsidy of those who make calls in the evening. It is anomalous that fixed CPs be allowed pricing flexibility on regulated rates, while mobile CPs are not. It is also entirely inappropriate to continue with an arrangement that is historically anchored to the retail pricing structure of one

[36] [✂].

CP. It makes compliance with regulatory SMP conditions less transparent. It is a concept of the last century which should be consigned to history.

In the event that Ofcom were to erroneously continue to allow Time of Day charging, Vodafone wishes to see far more rigour in ensuring that the overall price control is being complied with. We would like to see Ofcom both review the BT network tariff gradient calculation to ensure it is relative and meets the objectives of the NCC and then audit its application on an annual basis, and these results to be published.

7.5 INTERCONNECT TECHNOLOGY

Vodafone agrees with Ofcom's conclusion that IP cannot yet be considered the MEA for interconnection purposes. Although we consider Ofcom's proposals pragmatic, we are somewhat pessimistic about the prospect of industry agreeing commercial terms for the interconnection of heterogeneous networks, and feel that the ramifications of differing IP protocol and codec standards are not yet fully understood. We believe Ofcom should do more to facilitate a framework for dealing with this transition phase.

Vodafone agrees with Ofcom that whilst in a growth phase, IP cannot yet be considered as the Modern Equivalent Asset (MEA) for interconnection. We will not rehash all of the arguments we put forward in our earlier responses to the Call for Inputs and Network Model consultations, other than to re-iterate:

- There are no UK industry agreed standards for interconnect using IP technology that will meet all the regulatory obligations set out in the General Conditions. International standards are not specific enough on the treatment of prefixes such as those used for number portability, access codes such as 118, and treatment of 112/999 emergency calls. Bilateral agreements are possible, but this cannot be considered suitable for mass industry adoption. The UK technical standards agency NICC Standards Ltd has recognised this, and a suitable standard (ND1035) will be published shortly.

- Although the initial publication of ND1035 will be suitable for "simple" interconnection, it is not a universal solution as it will not (and never will) support the full suite of ISDN services, and in likely interim form will not support, for example, prioritised connection from 112/999 Call Handling Agencies to the emergency services. As such, it is an adjunct that relies upon a safety net of legacy C7/TDM interconnect routes to handle the "difficult" cases.

- Adoption levels of IP interconnection are relatively low, as a proportion of interconnection as a whole.

The material in the consultation was somewhat confusing around Ofcom's expectations where heterogeneous networks interconnect. We set out our interpretation of Ofcom's

position below, and would ask that (assuming we are correct) the final statement is clear in the regulatory guidance provided for this situation.

> CP-A, who utilises IP technology, wishes to interconnect with CP-B, who utilises TDM technology.
>
> For traffic from CP-A terminating to CP-B, the choice of interconnect location will be determined according to the TDM architecture in CP-B. For traffic from CP-B terminating to CP-A, the choice of interconnect location will be determined according to the IP architecture in CP-A.
>
> It is for commercial negotiation who does the interworking from IP to TDM and vice versa, but logically given CP-A will have constructed a new network and CP-B be sweating legacy TDM assets, the most common case would be for CP-A to do it.
> It is for commercial negotiation how the costs of interworking are shared between CP-A and CP-B. Three potential approaches could be:
>
> 1. CP-A carries out the interworking in both directions. CP-B charges their regulated termination rate for traffic from CP-A. CP-A charges their regulated termination rate, plus a commercial interworking charge for traffic from CP-B. Or
>
> 2. CP-A carries out the interworking in both directions. CP-B charges their regulated termination rate for traffic from CP-A, discounted by an agreed rate for CP-A having interworked the traffic from IP to TDM (being based on 50% of the interworking costs). CP-A charges their regulated termination rate, plus a commercial interworking charge (being based on 50% of the interworking costs) for traffic for traffic from CP-B. Or
>
> 3. CP-A carries out the interworking of its traffic destined to CP-B. CP-B (or a third party) carries out the interworking of its traffic destined to CP-A. Both charge each other the regulated termination rate.

Vodafone considers the approach set out is logical during this transition phase. We would have liked, however, for Ofcom to establish some criteria of when the transition phase was deemed to have been completed and IP be established as the sole MEA. We believe a blind faith position of “we’ll know when we’ve arrived at the future when we get there” is unlikely to be fruitful, and it would have created greater regulatory certainty had a framework be established.

Further, we anticipate that the approach is highly likely to result in regulatory disputes being brought before Ofcom about the nature of what represents a fair commercial charge for interworking. Given Ofcom has funded the development of a network model for the purposes of establishing regulated termination rates, we believe it would have been a cost-effective extension to further model efficient costs of interworking, in order that the material would be available when disputes are escalated to Ofcom.

We consider that in documenting its guidance, Ofcom should be clear on the assumptions used. For example, where we refer to “TDM” and “IP” above, we specifically mean complying with a specification as published by a UK technical

standards agency. Absent this, a terminating IP CP could demand that originating CPs interconnect using a proprietary IP interface, or internationally standardised one that is incapable of supporting UK regulatory services without bilaterally agreed profiles: while this should not be precluded from a regulatory standpoint, it should be equally clear that the originating CP should not have to fund developments to fulfil this requirement[37].

While the material above relates to interconnection between IP and TDM, Vodafone cautions that similar situations could arise where two IP networks interconnect. The technical standards are reasonably flexible on the choice of codecs and packetisation rates, and it is entirely plausible that one IP network will have chosen a different norm to another. This is particularly the case where, for example, the coding to IP is done by an enterprise customer or overseas, rather than equipment at the edge of the CP network such as an MSAN. Ideally codec negotiation within call establishment will lead to a mutually agreeable codec/packetisation rate being used. If, however, transcoding is required, all of the considerations above arise, with the word "transcoding" substituted for "interworking". Further, we foresee potential flashpoints where CPs that have been using low bit-rate/more efficient codecs within their network, find they have to carry a larger proportion of high bit-rate/less efficient codecs because of the choices made by other CPs.

7.6 NOTICE PERIODS

Vodafone agrees the reduction in BT notice period for services in the basket of products, so long as this is reciprocated by contractual notice periods for BT's own non-regulated services (with the exception of Transit) being increased to the same 56 days as currently required from OLOs for all services.

We have consistently argued that the appropriate notice period should be decided upon based on an assessment of what is required, what is practical and what is fair. The key consideration in setting notice periods is to give sufficient time to enable all retail CPs to adjust their prices on the back of a wholesale pricing change around the same time, leaving no one party at a disadvantage. The length of the supply chain itself is undoubtedly a factor, with some CPs buying through one or two chains of carriers with price changes also having to cascade to resellers.

We have no objection in principle to BT's current requirement to provide 90 days notice on certain services being reduced to 56 days as we believe this still allows sufficient time for any changes to be cascaded through. However our agreement on making the change is conditional on the introduction of a reciprocal increase in BT's Standard Interconnect Agreement (SIA) 28 day contractual notice period for its own servives to 56 days. We understand that the SIA review discussions currently underway are

[37] Whilst in principle the same applies with TDM, the greater maturity of standards means it is less likely to occur.

developing such an amendment to ensure the harmonisation of notice periods and we believe Ofcom should support such a symmetrical arrangement.

Should BT fail to honour an increase in notice from 28 days to 56 days then we believe it would be appropriate for CPs not agree to the SIA modifications reducing the 90 day notice requirement to 56 days, so it would remain a contractual commitment on BT's part, even if it wasn't underpinned by specific regulation. We are however optimistic at this point that an industry consensus on these SIA amendments can be found.

Note that we deliberately exclude Transit[38] from the above argument as we recognise that there is a dependency on BT's turnaround time for processing and publishing rate change notices received from OLOs. We would therefore suggest that it is for the parties involved in the SIA review to try and reach a compromise reflecting the constraints inherent to the Transit market.

Vodafone Limited
March 2013

[38] By transit we are referring to the services listed in section 1.12 of the BT CPL which denotes the prices BT charge for terminating calls on behalf of one CP to another CP via the BT network. This charge is typically made up of the end termination charge and BT's regulated single transit fee