Vodafone comments on Draft Commission Recommendation on regulated access to Next Generation Access Networks – second consultation
17 July 2009

Questions and comments should be directed to richard.feasey@vodafone.com

Contents

Executive summary

1. Vodafone provided comments on the Commission's first draft Recommendation. At that time we said:

    - we believed that NGA provides a once in a lifetime opportunity not simply to safeguard existing models of competition, but to be more ambitious and extend competition further than before

    - we were sceptical about the practicality of passive remedies, on which the Commission appeared to place heavy reliance

    - we thought access to unbundled fibre was easier to implement than access to ducts, with no loss in terms of competition or differentiation. Access to unbundled fibre was seen by us as an essential remedy to be included in the Recommendation

    - we thought regulators needed to take a more proactive role as NGAs are being planned and investment decisions contemplated. NRAs cannot just deal with the consequences of those decisions at a later date. In particular, we said that when technology choices directly impact the resulting prospects for competition, the Recommendation cannot be 'technology neutral'.

    - we said that the Recommendation should aim to ensure that regulation is used to shape and encourage pro-competitive investment by SMP operators from the outset. Less intervention (particularly in relation to Wholesale Broadband Access) should be proposed if investments are made which facilitate subsequent competition. More intervention will be required if not

    - we said more thought should be given to the conditions under which SMP operators might be able to switch off copper networks before the 5 year notice period provided that 'ringfenced' NGA WBA products were available to existing copper wholesale customers.

2. Much has been debated in recent months, but we stand fully behind these comments[1]. We are pleased to find that many of them are addressed by the Commission in the second draft Recommendation.

3. We particularly welcome the Commission's willingness to consider new and innovative approaches to regulation which might improve the prospects for investment and competition in NGA (but which might not have been relevant to the copper environment). We strongly believe that the benefits and opportunities afforded by NGA for Europe will only be realised if we are willing to explore new commercial models and new approaches to the regulatory challenges. The Commission's willingness to embrace new ideas and new approaches in this second draft should be an example to others.

[1] We attach Vodafone's initial comments, which includes an Executive Summary at Annex II

4. This said, our views have also developed since the first consultation:

- we have now seen the Commission's draft guidelines on state aid. We think the state aid guidelines, the revised Recommendation and future Commission thinking on universal service need to be considered together as part of an overall strategy to promote NGA deployment in Europe. We understand the Commission will publish such a Broadband Communication in the coming months, a step which we welcome

- we have become particularly interested in the concept of 'co-investment' as a means of developing NGA, safeguarding competition and reducing the need for regulatory oversight. The Commission also appears attracted by this idea, although our concept is not quite the same as the Commission's. The general approach which the Commission has adopted in Annex III – linking regulation to different investment proposals -is one we strongly support and which we advocated in our comments on the first draft Recommendation. At the same time, it will be very important to ensure that co-investment is properly defined and cannot be used to disguise arrangements which remain fundamentally anti-competitive in intent. We explain in Annex 3 to this submission what we mean by co-investment and how it might work, although we also recognise that there remain some important questions to resolve.

- although clearly required in some circumstances, we still think the setting of cost-orientated prices for NGA access will prove more challenging for NRAs than the Commission (and some NRAs) suppose. Simply relying on price squeeze tests will not altogether avoid these challenges either. NRAs will need to assess prices in a market in which we have penetration pricing, complex risk sharing arrangements, large information asymmetries and service bundling. The current draft Recommendation fails to give adequate attention to these tasks. Much more work should be done, and guidance given (whether in this Recommendation or elsewhere), on the application of price squeeze tests in an NGA context[2].

- another issue requiring more attention from the Commission – perhaps in the context of the Broadband Communication rather than this Recommendation – is 'copper switchover'. The challenge of NGA investment largely derives from uncertainty about the rate at which users might migrate from copper to fibre and their relative willingness to pay when doing so. This creates uncertainty for incumbents and competitors alike. Total costs will be higher if both copper and fibre infrastructures are maintained in parallel over many years. Some commentators have recently begun to suggest that NRAs might take a more active interest in facilitating or accelerating 'copper switchover' – as has been undertaken by the Commission and national Governments in the transition from analogue to digital terrestrial television. The challenge of co-ordinating amongst

[2] For example, what is the 'efficient competitor' assumption in the presence of long –term access pricing outlined in Annex 1?

different firms and users, as well as the situations such as this in which collective and societal benefits can offset individual costs and create a case for public subsidy, make this an area where regulatory or Governmental action may be needed.

Detailed comments

5. This section provides some more detail comments on specific aspects of the current draft Recommendation which we think particularly important.

Copper pricing principles

6. Annex 1 makes passing reference to copper sub-loop pricing and the lack of justification for a risk premium. This implicitly accepts that the methodology otherwise currently employed by NRAs to set copper loop prices should persist. This methodology generally involves using a forward looking LRIC model to recover the efficient replacement costs of the copper assets over the lifetime of those assets.

7. Vodafone believes that the migration to NGA should also prompt a more careful examination of the current approach to copper loop pricing.

8. An intrinsic part of the current approach is the economic valuation of assets. There are two debates. The first is a debate about whether serviceable copper loops that have already been fully depreciated should be included in the asset base, since investment on these loops will have already been recovered. Vodafone believes that a proper forward looking evaluation should take these assets into account.

9. However, there is also a second issue that emerges as the SMP operators seek to include large numbers of copper loops that are fully depreciated and for which there is no longer any demand (principally because of the growth of mobile-only households, and in future because of migration to fibre networks). It is beyond dispute that these copper loops, although in principle serviceable, now have no economic value. As such, Vodafone is clear that these loops should be excluded altogether from the SMP operator's cost base.

10. This issue is becoming significant because there are a number of recent cases in which SMP operators have sought, and have obtained, significant increases in the regulated price of unbundled copper loops, partly because previously active copper loops are now being decommissioned. NRAs should ensure that loops excluded from the volume denominator of the unit cost calculation should also be excluded from the cost numerator.

11. We note that some SMP operators have argued that higher copper loop prices are required to incentivise investment in NGA. The reverse would seem true to us. Allowing SMP operators to earn returns on assets which have no economic value will simply incentivise SMP operators to retain their copper plant for longer than it is efficient to do.

Annex III

12. Vodafone strongly supports the principle and intention behind the new Annex III and therefore strongly disagrees with ERG proposals to delete it. The Annex is intended to provide investors with clarity and certainty about the regulatory conditions likely to attach to different types of investment. We believe that a balance can and must be found between the need to provide such certainty and the need to respect the existing legal framework and avoid being too prescriptive in the Recommendation itself. We explain below in our discussion of market reviews how we think this can be achieved.

13. We also strongly support the intention of presenting clear trade offs between regulatory obligations and investment decisions, so that operators face clear incentives and choices when favouring one approach over another. Regulators must take the opportunity to use the tools at their disposal to influence investment decisions, and hence competition, in NGA[3].

14. Our subsequent comments should therefore be read in this context of strong support for the principles and intent behind Annex III, albeit with significant amendments. This Annex provides incumbent SMP operators with opportunities to alter their regulatory outlook and provides NRAs with opportunities to influence investment decisions. It is also intended to commit both sides. It is therefore critical that the conditions are got right and that there is no opportunity for abuse or gaming on either side. Only genuinely competitive co-investment projects should be able to meet the criteria we propose.

Annex III Section 1

15. Given the above, we are not persuaded that the conditions detailed in Articles 23, 24, 37, 38 and in Part 1 of Annex III should prompt a different set of regulatory remedies from those applying to a single SMP operator. We recognise that a duopoly may be better than a monopoly, but we are not persuaded the difference in competitive outcomes from a multi-fibre duopoly is likely to be such that a fundamentally different regulatory approach can be presumed. This is particularly so in view of our doubts about the applicability of multi-fibre in many circumstances (see below).

16. We believe that Section 1 of Annex III (and Articles 23, 24, 37 and 38) should be deleted and that duopolistic arrangements, multi-fibre or not, should attract the same remedies as the Commission proposes for single SMP operator.

[3] Something that NRAs regularly do when, for example, licensing radio spectrum or setting LLU and bitstream prices for current broadband services

Annex III Section 2

17. We have two sets of comments on Section 2. Most relate to the conditions which need to be met for Section 2 to apply and some relate to the consequences of meeting whatever conditions do apply.

18. It may be helpful if we start by outlining our thinking in more detail in this area.

19. We see two basic models for effective competition in the NGA environment. The first involves imposing conditions, or creating incentives, upon the monopoly network of the incumbent to deal equally with all downstream retail players. This is the 'horizontal' solution, in which effective margin squeeze rules are required to ensure that the incumbent does not exploit its control over wholesale inputs in order to foreclose competition downstream. The cleanest version of this model is an effectively functionally (or structurally) separated firm, in which case, as the Commission note, some further remedies may be unnecessary if it is applied properly. The more extreme versions of this model are being pursued actively in some other parts of the world[4], but less so in Europe.

20. Price squeeze and non-discrimination rules – with all their associated challenges - remain a critical feature of this horizontal approach since no operator other than the incumbent can replicate the wholesale inputs. Regulators must worry about the horizontal interfaces between the input and downstream retail markets.

21. The alternative model is the 'vertical model' of multiple competing networks – whether real or 'virtual' in nature. The multi-fibre and co-investment models are examples of this latter type. In these models, all firms have access to their own wholesale inputs (or to shared inputs) and the incumbent operator has no strategic control over them. In these circumstances, regulators might worry about the vertical interfaces between firms (eg collusion) but 'price squeeze' and other horizontal remedies have no place[5].

22. We consider this distinction to be one of the key advantages of the 'vertical' model over the 'horizontal'. Both are in principle capable of delivering effective competition, but the latter rely heavily upon the effective application of regulatory price squeeze models whilst the former do not. It is of course possible that co-investors could jointly act to price squeeze non-investors who are attempting to compete in the downstream retail market. This sometimes appears to be at the back of the Commission's mind, although it is unclear why the Commission believes a price squeeze test should be applied if no SMP is established[6]. There needs to be sufficient co-investors (and other attributes) to ensure effective downstream competition to eliminate this concern[7].

23. We therefore agree with the Commission that sufficient co-investors need to be present on the retail market to produce an outcome in which no SMP is found.

---

[4] Eg. Australia and New Zealand

[5] The only concern that remains would be predatory pricing on the part of a firm with SMP in the downstream retail market

[6] See recital 30

[7] As is the case in mobile markets which combine high levels of investment with effective retail competition

However, the nature of the investors will also be important and the market assessment by NRAs will not be a mechanistic exercise. The incumbent SMP operator must not be allowed to create a consortium of ineffective competitors or sleeping partners in an attempt to exploit the regulatory opportunity offered by Section 2. Our proposal that the process by which participants are recruited be transparent and open to all is in part intended to address this.

24. Our comments on the list of conditions identified by the Commission in Annex III Section 2 are therefore as follows:

- it should be made clear that 'co-investment' refers specifically to joint ownership and control of a single network infrastructure, to which all participants enjoy equivalent access.

- we do not accept that, in principle, co-investment should only be confined to FTTH and not to FTTN networks (although we agree that the model is much more likely to be applicable in practice to FTTH). More importantly, we would wish to ensure that the Recommendation does not exclude co-investment in either active or passive networks and that the reference to 'FTTH networks' can be taken to apply to either case

- we agree that 4 operators is likely to be a good basis for presuming an absence of SMP (although we would not want to exclude either the possibility that a market review might not conclude that 3 operators can produce this outcome in specific circumstances or that a proposal with 4 or more operators might nonetheless produce an SMP finding if those other operators were ineffectual retail competitors)

- we agree that these firms need to be competing effectively in the downstream market. Since we also believe that the market review needs to be concluded and a determination on SMP made before investment is committed, we would expect that NRAs will require some form of commitment from co-investors in this area (although the Recommendation should not be prescriptive on this). We are continuing to explore what form such a commitment might take. The subsequent withdrawal or retreat of a co-investor from the retail market might be a trigger for a market review (see our Annex 3)

- we agree that each firm should enjoy equivalent access to the joint infrastructure – in fact, we doubt that co-investments would be made at all without such a result. However, we are troubled by the reference to 'cost-orientated access' in this context. This is a concept appropriate to regulated undertakings but not to commercial agreements between firms. We can envisage a wide variety of financing structures for co-investment vehicles, some of which may involve upfront investments for equity and others which may involve rentals for capacity on a line by line basis. Whether all of these could be said to be 'cost orientated' is unclear to us but not in any event required for co-investment to work. This is because price squeeze considerations will not apply if all co-investors can access the network resources on the same terms and nobody has SMP. We therefore believe that the reference to 'cost-orientation' is unnecessary and inappropriate in this context and that it should be deleted.

- as explained below, we do not see multi-fibre and co-investment as necessarily being complementary. There are many co-investment models which would deliver effective competition in the downstream market without multi-fibre. We see this condition as unnecessary and restrictive and think it should be deleted.

- we do not think that additional duct capacity is necessary to ensure effective competition given the other aspects of the co-investment model, and nor do we think it likely, in practice, to deliver it. The co-investment approach is partly derived from the belief that duplicate network investment is likely to be either infeasible or inefficient. This will be even more so in the presence of another co-invested network. Requiring duct access in these circumstances is inappropriate – NRAs should instead ensure that new participants have a reasonable opportunity to join the co-investment vehicle (see Annex 3 for details).

- we accept that there will be a need to migrate existing copper customers to equivalent products on the NGA network. We would expect many of the co-investors to also be major providers of existing copper-based services and therefore able to make their own arrangements. But we accept that there may be some providers (and hence retail customers) who will not otherwise participate in the NGA environment. We are not sure, however, that it is efficient to oblige all co-investors to develop and offer such a migration product. It should be required that *at least one* co-investor provide such a service (with sufficient capacity to meet all reasonable demand). This might be the former SMP operator, another of the retail co-investors, or a dedicated co-investor who does not themselves compete in the downstream market (a 'wholesale only provider') with access to sufficient resources on the new NGA network to service this demand. Again, we think the Recommendation should not be unduly prescriptive on this matter, but should establish principles which NRAs must consider when undertaking the market review and appraisal of specific co-investment proposals.

25. Although we have proposed the removal of certain conditions proposed by the Commission, we have also identified omissions which the Commission might consider adding to Section 2:

- the process by which participants in the co-investment project are selected must be transparent, fair and non-discriminatory. This does not mean that everyone has the right to participate or to invest irrespective of the amount of capital they wish to invest. The creation and management of the co-investment vehicle is likely to require the use of thresholds or other allocation tools to restrict participation to those placing the highest value upon it (thereby maximising investment) and to prevent freeriding. Given this, the process by which participants are selected is one that NRAs will wish to review (and which they may wish to be involved in establishing). There are many ways in which this might be undertaken and the Recommendation should not be prescriptive provided that transparent and objective criteria are applied (see Annex 3 for more detail on these issues).

- we have referred to the need to reserve some capacity on the network for a wholesale only investor or investors who would then be expected to resale this to third parties not participating in the co-investment vehicle themselves (and who would then use these wholesale services to compete with the retail co-investors in the downstream market). This wholesale only investor would have to be able to price independently of the other retail co-investors (i.e. the Netco shareholder would not set the wholesale price collectively) and to have sufficient capacity to meet reasonable demand. Of course, the retail co-investors would also be free to sell wholesale capacity to third parties in competition with the wholesale only player – but this should not be a condition of the Annex.

Annex III – market reviews

26. Some commentators, including ECTA and ERG, argue that Annex III cannot amount to a per see finding of no SMP and that, in each case, a market review should continue to be undertaken with regard to all factors likely to influence competition.

27. Vodafone accepts that a determination of whether a particular set of co-investment arrangements would result in a finding of no SMP or not is complex and likely to require consideration of the specific facts of the case. Not every investment that appears to be or is referred to as 'co-investment' will necessarily deliver competition and NRAs will retain an important role in making these judgements.

28. On the other hand, market reviews are already required to be forward looking and we remain convinced that clarity and commitment on the regulatory conditions which any co-investor will face going forward are absolutely essential. A balance must be found.

29. We propose the following:

    - the NRA should undertake the market review as a parallel process whilst the co-investment vehicle is being structured and the conclusions of this review must be published before investors are required to commit capital. Since we envisage that in many cases NRAs are likely to be actively involved in the development of co-investment vehicles, we do not think this will be problematic

    - once the results of this initial review are published, NRAs should indicate clearly the circumstances which would be likely to lead them to a different conclusion in subsequent ex ante market reviews, at least for the first 10 year period[8]. Whilst such guidance clearly could not anticipate every outcome and would not exclude ex post competition law intervention in the case of anti-competitive co-ordinated behaviour, it would serve to create legitimate expectations on the part of investors and commitment on the part of the regulatory authorities.

30. We do not think that the current text (articles 26, 27 and 42) provides sufficient certainty or commitment around the issue of market reviews. We propose that these be amended or expanded along the lines outlined above.

[8] As the Commission notes 'NRAs should clarify to the greatest extent possible how foreseeable changes in market circumstances might affect remedies ' (recital (8))

Multi fibre

31. The Commission clearly conceives of co-investment and multi-fibre[9] as being complementary features of almost any NGAN. Although we do not exclude the arguments for multi-fibre in some cases, we do not fully share the Commission's enthusiasm for this approach. In particular, we do not accept that multi-fibre deployment is, in itself, ever likely to be sufficient to ensure a different approach to regulation for an SMP operator or a duopoly.

32. We think co-investment and multi-fibre are more likely to represent alternative approaches to the development of more pro-competitive infrastructures than to be complementary. Co-investment is likely to involve the joint funding and construction of a single NGA network, whether GPON or P2P, in which the connection to the customer is allocated by the co-investment company to whichever investor acquires that retail customer. Customers can readily switch between different owners of the joint network since all have equal rights to a particular customer connection[10]. In these circumstances, multi-fibre will normally add no additional competitive benefit. In saying this, we assume that all co-investors will want to ensure that they can reach all end users before they participate in the venture. Otherwise it is difficult to see why they would participate. The co-investment model will therefore solve the same problem which multi-fibre is intended to address without the Commission needing to require it as a specific feature. This is why we see no reason to specify multi-fibre as a condition of a no SMP finding in Annex III Section 2

33. On the other hand, a P2P network which is capable of being fully unbundled (and to which consequent remedies apply) also does not obviously require multi-fibre deployment since customers can be readily switched between retail service providers using the same dedicated fibre[11]. The Commission suggests that there is a greater risk of discriminatory treatment in mandated single fibre unbundling[12] and Article 19 requires unbundled access *in addition to* multi-fibre. It is not clear to us that multi-fibre necessarily represents such a superior competitive alternative.

34. A case for multi-fibre may exist for a GPON or FTTB network which is being deployed by a single SMP firm which would otherwise prove incapable of being unbundled (as we have seen in France). But in this case multi-fibre is only one consideration that is likely to determine the prospects for competition: the location of the aggregation point and the pricing arrangements under which third parties might access the multi-fibre will also be critical considerations. Moreover, the Commission's proposed requirement that all networks should be capable of being fully unbundled (Article 20)

[9] The Commission does not precisely define what it means by multi-fibre in this context – the Recommendation would benefit from greater clarity on this point. We take it to mean the deployment of a multiple fibres between the first distribution point and the termination point to the user (see Art 18). However, in Article 9 the Commission also appears to envisage multi-fibres in the 'feeder' network, which we assume to mean between the distribution point and the MPoP.

[10] We recognise that the co-investors would need to formulate rules as to how retail customers are switched between different retail service providers (whilst still being connected by the same network).

[11] We therefore do not understand the claim that multiple fibre lines are 'technologically neutral' (recital 19). The technology deployed determines whether multiple fibres are necessary in the first place. In the case of P2P, the challenge of running 'multiple single fibres' may be significant anyway – to attempt to run 'multiple multiple fibres' within existing duct infrastructure is unlikely to be feasible even if practical.

[12] Recital 28

suggest that GPON networks will require wavelength division technologies which may again achieve the same objectives as multi-fibre by different means.

35. In summary, we think the Commission would be wrong to consider multi-fibre as a universal remedy applicable to all circumstances, or to rely upon multi-fibre alone as a basis for concluding that there is a case for less intervention in other areas. There are many opportunities for incumbent SMP operators to deploy multi-fibre networks in ways which would inhibit competition.

Annex I - Summary of proposed changes to second draft Recommendation

Recital 6: make clear that NGA provides the opportunity for NRAs to undertake market reviews on a forward looking basis prior to investments being made provided that the conditions under which those investments will be made are sufficiently clear to the NRA. Conducting market reviews at this stage and determining whether and what remedies may be required will greatly contribute to certainty and is likely to improve the prospects for investment in NGA. This amendment may be linked to recital 8.

Recital 19: delete last sentence.

Recital 22: delete last sentence for same reasons as above

Recital 29: delete all

Recital 30: delete reference to 'mandating access and ensuring a sufficient margin' since if no SMP found, these remedies are not required or appropriate. Combine with recital 32

Recital 48: the Commission should clarify and illustrate what it means by 'proven' functional separation. This requires, at a minimum, that the retail activities of the SMP operator are undertaken at arms length and on the same terms as third parties – and that all the requirements of equivalence detailed in Annex II are met.

Article 8: delete reference to less densely populated areas in definition of 'co-investment in FTTH' and define as joint ownership and control of a single network infrastructure, to which all participants enjoy equivalent access.'. Clarify that FTTH networks in this context may refer to co-investment in either passive or active networks.

Article 23: delete

Article 24: delete

Article 25: include reference to where further guidance on margin squeeze tests is to be found

Article 26: amend to conform with proposed revisions to Annex III Section 2 (see below)

Article 37: delete

Article 38: delete

Article 39: conform to Article 25

Annex II Clarify that principle of equivalence applies to all wholesale services, whether passive or active, and not simply to civil engineering infrastructure/ducts.

Annex III

Delete Section 1.

Amend Section 2:

- delete reference to multiple fibre lines
- delete reference to 'cost orientated access'
- delete reference to installing sufficient duct capacity for third parties
- amend to provide that 'at least one co-investor' enables third parties to migrate to comparable NGA wholesale products
- add reference to conditions for participation in co-investment network being transparent, fair and non-discriminatory

Annex II – Vodafone submission to first EC draft Recommendation

vodafone

Draft Commission Recommendation on regulated access to Next Generation Access Networks
Comments by Vodafone

1. Vodafone welcomes the Commission's determination to establish clear principles about the regulation of Next Generation Access Networks (NGAN) as early as possible. We agree with much that is contained in the draft Recommendation.

2. Vodafone is one of the few fixed broadband providers with interests across the European Union (and the only such operator to serve consumers as well as businesses). We already provide broadband services using DSL in every European market – eight in all - in which we own mobile operations. We support the Commission's wish to ensure that consistent regulatory principles are applied throughout the European Union. The application of those principles will not necessarily produce the same outcomes given different local conditions.

3. This submission contains an executive summary. We then outline our approach to NGAN regulation in detail and also suggest the specific amendments to the draft Recommendation which we think follow from it.

Questions and comments should be directed to richard.feasey@vodafone.com

Executive summary

1. We welcome the Commission's draft Recommendation on NGANs. We agree that establishing clarity on these important issues is essential before investments are made and that a consistent approach to these matters is needed throughout Europe.

2. We should not be satisfied with the current level of broadband competition in Europe. Simply protecting existing levels of competition as we move to NGAN is the wrong goal. We believe that, with the right regulatory approach, NGANs provide an opportunity to extend competition.

3. The underlying NGAN architecture will have profound consequences for the prospects of competition. NRAs cannot and should not mandate particular technologies, but they should certainly encourage operators to build NGANs which will facilitate the greatest competition at the lowest cost.

4. NRAs cannot wait for the production of a reference offer by the SMP operator after the network has been built. They should instead adopt a proactive role by assessing the prospects for competition and regulation in light of the operators' NGAN plans and proposed technology choices but before anything is built.

5. Creating the right incentives for NGAN competition involves recognizing that Wholesale Broadband Access (WBA) is not (only) something that is needed to safeguard service competition. WBA is one of the main tools which NRAs can use to ensure that competition using passive elements has the best chance of succeeding. That means that more thought also needs to be given to the pricing of WBA.

6. NRAs also need to pay particular attention to the location of concentration points in FTTH, the provision of co-location space within cabinets in FTTN, and the availability of dark fibre. Getting these three issues right is fundamental if competition is to be extended in NGAN. We think the draft Recommendation should place more emphasis on the need for NRA action on the first two issues, and that it understates the potential for dark fibre to contribute to competition (by relegating it to a remedy of last resort.)

7. Competitive NGANs involve facilities that need to be shared between firms. Determining the costs of the facilities is important but NRAs will find it theoretically difficult and practically impossible to distinguish between 'existing' and 'new' investments, as the Commission propose. Determining how those costs are then to be allocated between firms is equally important. We believe that the Commission should consider further including guidance on cost allocation in the Recommendation.

8. An extension of competition through NGAN should not be to the detriment of existing DSL-based competition. It is therefore critical that clear rules about the migration from DSL to NGAN are established long before actual migration is contemplated. Getting the most competition at the lowest cost means that SMP operators need to be able to avoid unnecessary duplication between NGAN and DSL facilities, whilst investors in ULL need a reasonable return if they are to

continue to invest in the meantime. We propose a combination of a 5 year notice period and the availability of a ringfenced WBA migration product to ensure this.

Table of contents

The overall ambition of the Recommendation should be to extend competition beyond current levels

1. NGANs present new challenges for regulators which the Commission rightly identifies in the draft Recommendation. But we also firmly believe that NGANs also present new *opportunities* for regulators. This is because traditional fixed network regulation had to overlay regulation onto networks that had already been built and investments that had already been sunk. Regulation has been concerned with controlling or constraining the exercise of market power that has arisen from these networks, originally built in monopolistic markets. Never before have regulators sought or been able to influence the design of the underlying network itself.

2. NGANs present an historic opportunity to do this. Regulators can and should encourage investment in networks which will enable a more competitive and more sustainable broadband market than we have seen emerge in most Member States to date. With the right regulatory approach, we can and should use NGANs to extend competition. In doing so, we can begin to enjoy the kind of innovation and benefits which we have taken for granted in Europe's mobile markets for the past 20 years. Too passive a regulatory approach risks losing even the gains from fixed broadband competition which Europe has seen in recent years.

3. All parties will benefit from a more competitive and more sustainable broadband policy framework. Consumers will be better served. Existing and new competitors can grow their businesses rather than simply trying to cling onto the 'ladder of investment'. Investors in NGAN infrastructure can have more certainty and the prospect of less regulation before they have to commit to invest. Options which are not available once the network has been built are still available today.

4. Overall, we think that the current Commission draft Recommendation does not go far enough in seizing the opportunity presented by the NGAN investments which are likely to be made over the next few years. We make some suggestions which are intended increase the opportunity to use NGANs to enhance competition[13].

Establishing the right framework from the outset

5. The current legislative framework presents two challenges for NGAN, both of which are to some extent evident in the Commission's approach in the draft Recommendation.

6. The first challenge is that the Recommendation is presented in the context of the existing Article 7 process in which markets are periodically reviewed and adjustments made as competitive conditions change. Article 7 was designed at a time when most markets were already well established, networks were already built and an existing regulatory architecture was already in place. Its main purpose was to

[13] The Recommendation does not address the important issue of functional separation, which is highly relevant to the outlook for NGAN. We understand why this is so but assume that the Commission may provide guidance on this issue in a subsequent Recommendation. We agree with (and do not comment further on) the contents of Annex II, which address the related issue of equivalence.

determine when existing regulatory obligations – inherited from the previous framework – might be withdrawn as competition developed.

7. NGAN represents a potentially much more fundamental disruption of the technological and competitive landscape. To some extent, this is already recognised by the language employed in the draft Recommendation, particularly in the references to encouraging 'build and share' projects[14] and the promotion of fibre instead of copper at greenfield sites[15].

8. The Commission suggests:

> *NRAs can also seek where possible to reduce entry barriers or offset the potential impact on effective competition where barriers may increase.*[16]

9. We think this is the most critical objective and that should be explicitly established as such in the Recommendation. Article 10 currently suggests that SMP operators should be required to provide NRAs with details of the network they intend to build. We think that this should be only the beginning of a process in which the NRA should consult other stakeholders in order to determine the likely competitive consequences of a particular set of proposals (i.e. the economic viability of competition in view of the particular network architecture (FTTC, GPON, P2P etc) being proposed). The NRA should then define the regulatory remedies it considers appropriate in light of the proposed network architecture. This, depending on the case at hand, may or may not include regulated Wholesale Broadband Access pricing (see below). The SMP operator can then determine whether they wish to amend their proposals in light of the regulatory framework proposed by the NRA (and to which the NRA would then be committed for at least a significant period). The input of other stakeholders will be essential in both developing the framework and getting commitment to it from all parties[17].

10. Only after this initial process has concluded (but before any retail services are offered) would the SMP operator be required to make a reference offer in accordance with the framework that the NRA has developed. Article 9 currently envisages that the SMP operator is required to unilaterally issue a reference offer, without the NRA having first defined the appropriate framework. Yet this framework can only be devised in light of the prospects for competition associated with the particular network architecture which the SMP operator proposes to build. The SMP operator cannot and should not simply unilaterally propose remedies without prior consideration of these issues by the NRA.

11. This brings us directly to the second challenge: the concept of 'technological neutrality' which underpins the Framework and makes regulators reluctant to develop rules which might be seen to apply to particular technologies. In doing so, NRAs risk attempting to sustain a fiction that, when it comes to NGANs, technology choices do not have direct consequences for competition.

---

[14] Art 11
[15] Art 12
[16] Explanatory Note (hereafter 'EN') p.12
[17] A process similar to that we envisage here occurred in the development of BT's Openreach undertakings in the UK

12. In practice regulators already have rules which are not technology neutral. The different treatment of coaxial cable networks and copper based access networks is the most obvious example – cable has remained largely unregulated because the underlying technology imposes limits on the remedies that might be available to regulators. There is no suggestion that this will change and cable remains notable by its absence from the current draft Recommendation. The draft Recommendation also makes a clear distinction between FTTH and FTTC networks - and treats them differently[18]. It also urges NRAs to promote fibre over copper in greenfield sites[19].

13. We think the Commission and NRAs must promote some technologies over others in cases such as these when technology choices have such important consequences for competition. This should be made more explicit in the Recommendation, not less. The Recommendation should establish a framework which provides clear and strong incentives from the outset in favour of NGAN investments which maximize the prospects of 'downstream competition'[20].

14. In saying this, we do not suggest that the Recommendation or NRAs should specify how private investors spend their capital. The ultimate choice of network technology should remain in the hands of the investors themselves. But the consequences of those choices – and therefore the incentives to make them - do need to be spelt out by the regulators and by the Recommendation to a much greater extent.

Regulators should encourage investments offering 'the most competition at the lowest cost'

15. There is a trade off between competition and investment, at least in the short term, which it would be helpful for the Recommendation to address more explicitly. Networks that can more readily accommodate competition can also be more costly to build. Spare space for extra ducts or larger cabinets are obvious examples. Monopolies are often cheaper to build in the short term[21].

---

[18] There are at least two examples of technology bias in the draft. First, the Commission argues that FTTN does not require 'graduation of remedies' whilst FTTH does. The Commission justifies this on the basis that investment in FTTN has 'already largely been made' and therefore requires no risk premium. This is mistaken - both FTTN and FTTH may combine new and old investment. Second, the Commission makes clear reference to dark fibre as an alternative remedy in FTTH (Art 15), but no reference when discussing backhaul options for FTTN (Art 20). The first position makes FTTH investment potentially more attractive to SMP operators, whilst the second makes FTTN potentially more attractive instead.

[19] EN p.13

[20] Both in the sense of competition in the downstream retail market and in the sense of competition at a later point in time.

[21] For example, the additional cost of ensuring sufficient cabinet space for competitors is estimated by Analysys Mason to be 10%-20% of the total FTTC deployment costs (between £500m and £1bn on a total £5.1 bn FTTC cost for the UK). Similarly, P2P networks (which may be easier to unbundle and therefore more 'pro- competitive') are equivalent in the UK to adding €3-€5.5bn to the GPON cost of €30bn. Views vary between analysts on the size of these differences, but not that they exist.

16. The Recommendation should therefore require NRAs to encourage investments in NGANs which promise 'the most competition for the lowest cost' and should do more to explain what this might mean in practice. This involves answering questions such as:

    - How should NRAs view the relative cost/competition trade offs of different network architectures?

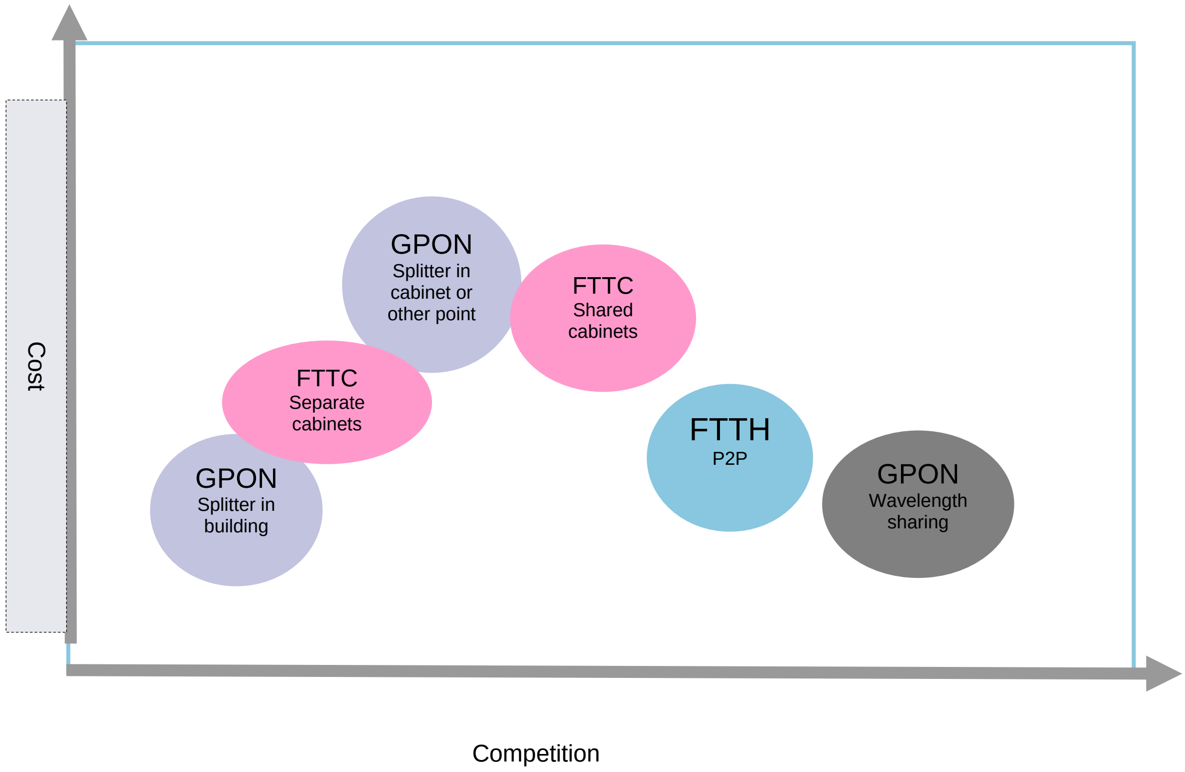
    - How should any additional costs incurred to accommodate competition be recovered?

    - What are the consequences if investors choose less competitive options which make passive remedies less economically viable?

17. The Recommendation already attempts to address these questions in part. Nonetheless, Vodafone believes that NRAs will need to provide much clearer guidelines (and commitments) about the regulatory consequences of different technological choices. Network deployments which more readily facilitate competition would, for example, result in less regulation in Market 5 than those which do not. Wholesale Broadband Access (WBA) should therefore be viewed as a remedy which both safeguards service competition *and* which encourages the development of competitive infrastructure[22]. A good WBA remedy may be one which does not need to be used very often because the resulting competition in Market 4 is more effective. We explain this further in our discussion of WBA later in this submission.

18. The main technological options for NGAN deployment in the foreseeable future – and their likely costs and competitive consequences – are already reasonably well understood. We illustrate below the range of options which investors might consider, many of which are already explicitly referenced in the draft Recommendation:

[22] As the Commission itself suggests at p.9, EN



This means regulators need to take a more pro-active stance on aggregation points for PON and cabinet sizes than implied by the draft Recommendation

19. NRAs should aim to incentivise the lowest cost investment in NGAN which facilitates the greatest prospects for competition (bottom right hand corner of chart) and to discourage high cost investment which restricts competition (top left hand corner) The Recommendation correctly recognizes that the main drivers in this are:

- the location of concentration points in GPONs
- the availability of co-location space in FTTN
- the availability of passive backhaul capabilities in both FTTH and FTTN

20. The draft Recommendation addresses the first of these in Articles 14 and 15. Article 14 appears to assume that GPON aggregation points should be located in the vicinity of the building and that NRAs will be in a position to dictate the location of these points to network owners. We are not convinced either of these assumptions is robust[23].

[23] Art 14 seems to reflect the recent debate in a specific market (France) rather than assessing the broad principles that should be applied. Recital (8) rightly recognizes that access to concentration points is 'crucial for the viability of network competition' but then suggests that 'negotiated agreements' will be reached between SMP and alternative operators. This may be the case in some circumstances, but cannot be assumed to succeed.

21. First, we think that the viability of competition should be the key determinant when seeking to optimize the location of these concentration points and that this may suggest that the concentration point is located much higher in the network (e.g. at existing exchanges). This requires an assessment of the trade offs between competition and additional investment costs as explained above. Article 15 moves in this direction by requiring:

> *Network access should be granted at the concentration point which allows access to unbundled fibres where it is economically viable*

22. However, this still falls short of establishing a clear framework which incentivises the installation of concentration points at locations which maximize the prospects of downstream competition. Extensive industry discussion will be required to develop a consensus as to exactly what this means in each market. The Explanatory Document is closer to our aim:

> *physical access to the fibre sub-loops should be mandated as a remedy in Market 4 at the SMP operators' concentration points identified and determined by the NRA*[24]

23. We suggest that this text replace Article 14 and that the Recommendation states clearly that NRA s should encourage the location of concentration points in PONs which will facilitate competition to the maximum extent possible and that network architectures which fail to do this (for example by locating concentration points at the building) will trigger stricter Market 5 remedies to safeguard competition.

24. Similarly, more emphasis is required on the need to incentivise operators to deploy FTTN cabinets which allow co-location within the cabinet[25] and to make it clear that a failure to provision such cabinets would also have consequences for the Market 5 remedy. The proposal that NRAs aim to 'facilitate agreements concerning the size of street cabinets'[26] suggests far too passive a role for the NRA in view of the criticality of this issue for future competition. A much clearer set of incentives needs to be established to incentivise the deployment of FTTN networks which will facilitate sub-loop unbundling to the maximum extent possible.

Dark fibre should be a co-equal remedy to duct access, not a last resort

25. Perhaps the most significant difference in approach to arise from our framework is that it leads us to question the Commission's preference for duct sharing over dark fibre[27].The passive remedies of dark fibre[28] and duct sharing produce similar competitive consequences, yet the draft Recommendation reveals a clear preference for what is likely to prove the more costly and difficult option.

---

[24] EN p.14

[25] The draft simply says that 'NRAs should take, where necessary, measures pertaining to the adequate size of street cabinets' (art 18)

[26] EN P.16

[27] EN p.14 'NRAs do not need to consider additional physical access obligations (such as dark fibre) when access to the passive infrastructure…is feasible'

[28] The Recommendation does not define dark fibre. In this context we mean both access to discrete fibres and access to individual wavelengths within a fibre.

26. Duct sharing yields few if any obvious competitive benefits to consumers or competitors beyond those which would be secured if dark fibre were made available on appropriate terms from the outset[29]. In those cases where dark fibre has been available on either regulated or non-regulated terms (such as Stockholm[30] or Japan[31]), NGAN competition and investment appears to have prospered. Existing Unbundled Copper Loops are the copper equivalent of dark fibre - so it is hard to see why the same approach to remedies should not apply in the NGAN context. We are not aware of duct or pole sharing being advocated in preference to 'dark copper' in the current context.

27. We believe that, compared to dark fibre, duct sharing will be less extensive and more expensive, adding significant regulatory overheads (both in terms of delay and direct costs of duct audits etc) in return for few additional competitive benefits. We see no good reason for the Commission to favour duct access over the equally effective dark fibre alternative[32].

28. On their own, these arguments would justify reviewing the current preference in the draft Recommendation for duct sharing over dark fibre availability. But we are also concerned that the draft Recommendation does not and probably cannot provide workable guidance about the circumstances in which dark fibre might be adopted as a remedy of last resort. Article 15 of the draft refers to circumstances where '*access to [duct sharing] is technically or physically impossible or where it is not economically viable for a sufficient number of operators to ensure effective competition'*[33]. We do not see how NRAs (or more likely the courts) will be able determine such viability or sufficiency ex ante – nor do we think that these are the right tests, for the reasons outlined above. The thresholds are so vague and evidence likely to be so contentious that we do not think this approach can be applied by NRAs in practice.

29. We conclude that the position on dark fibre in the draft Recommendation is neither desirable nor workable. We would advocate making dark fibre (with appropriate conditions) a co-equal remedy with duct sharing for *both* FTTH and FTTN deployments[34]. The present draft refers to dark fibre as a remedy of last resort in relation to FTTH in Article 15 and makes no reference at all to dark fibre in Article 2

---

[29] Dark fibre is likely to be available wherever duct sharing is feasible, but the converse is not true (which is why the Commission itself seems to accept that dark fibre may be a remedy of last resort when duct access is not available). It is true that, compared to duct sharing, dark fibre may limit the ability of competitors to develop a fundamentally different passive network architecture from the incumbent, but (a) the competitive benefits of this are in uncertain (mobile operators have competed effectively with substantially similar network architectures) (b) many fibre deployments already involve both tree and branch and ring deployments which would allow different configurations.

[30] Where 30+ competitors provide 100 MB/s connectivity using Stokab's dark fibre products.

[31] Where NTT has been required to offer dark fibre for several years. Another model is being proposed in Singapore, where the OpenNet consortium will be required to wholesale dark fibre to third parties.

[32] An effective dark fibre option in this context would be one with no restrictions upon the use to which it can be put and the same security of tenure implied by occupancy of a shared duct. These are conditions which should be specified in the Recommendation.

[33] See also p.14, EN

[34] We also think that a reference to 'pole sharing' should be included.

Wholesale Broadband Access requires significant NRA attention and a more sophisticated approach to pricing

30. The draft Recommendation rightly anticipates that SMP will continue to be found in Market 5 in the majority of cases and that this will require the development of active WBA remedies. Vodafone considers that, given the uncertainties surrounding the effectiveness of the Market 4 remedies and the time that it will take for them to be delivered[35] (even if the Commission were make the modifications that Vodafone suggests to improve their effectiveness), an effective WBA remedy will remain an essential safeguard for competition in all Member States for the foreseeable future[36]. Many concerns would be addressed if the Recommendation were to say this clearly.

31. We are concerned that the NGAN debates in many Member States today underestimate or neglect altogether the difficult task of specifying WBA services in an NGAN environment. We are also concerned that the Commission appear to see WBA as a remedy which can be considered later if other remedies prove inadequate[37]. We think that it is already clear from the various economic models of the likely scope of NGANs that a WBA remedy will be required in all Member States and that there is therefore no reason to delay work on this issue.

32. A key requirement which distinguishes NGAN WBA from existing bitstream will be the specification of wholesale (as opposed to resale) products which effectively support the integration of multicast video and TV services. At this stage we see a significant risk either that WBA products are not specified at all or that WBA products are specified but that they prevent effective competition in video services. This would effectively foreclose competition in much of the retail market. Given the uncertainties that currently surround the efficacy of remedies in Market 4, this is a real and serious concern.

33. The draft Recommendation should therefore make it clear in Article 9 that the 'relevant inputs' that must included in a reference offer of the SMP operator should include a fully specified WBA product and that this must be available prior to the commercial launch of any NGAN-supported retail services. To achieve this, the Recommendation should require NRAs to establish appropriate processes, including consultation with stakeholders, to oversee the effective and timely development of such products.[38].

---

[35] Experience of passive remedies in the DSL environment suggests that, even if they are viable, it will take some time for the processes to stabilise. In the case of DSL, early availability of bitstream products was essential to safeguard competition in most Member States

[36] We also agree that NGAN deployment does not generally break the chain of substitution for broadband products and that, in particular, the availability of higher bandwidth internet access (eg. above 30 MB/s) does not represent a distinct product market for the purposes of Market 5 (as the Spanish regulator CMT erroneously supposes in its current Market 5 proposals).

[37] 'Experience shows that where remedies on the market for wholesale physical access have worked well, remedies on the upstream market for wholesale broadband access were not required' ED, p.4. See fn 23 above – this may be the case today, but was not the case during the early stages of the development of the broadband market, when the reverse was more often true.

[38] There are limited exceptions. Ofcom in the UK has overseen the development of 'Active Line Access' WBA offer by BT. This work is ongoing and could provide the basis for an EU-specification. KPN has also developed WBA-type products in the Netherlands, although these combine resale and wholesale characteristics. Work on

34. Whilst product specification is important, the pricing of Market 5 products is also critical not only for the prospects of downstream competition but also for the operation of passive remedies in Market 4. As noted above, we think the pricing of WBA should be used to incentivise network investments which facilitate competition using passive elements. This is a somewhat different approach from the traditional 'ladder of investment' approach. In our case the pricing of Market 5 products is being used to try to influence the investment incentives of the SMP operator. With the ladder of investment the attempt was being made to influence the investment incentives of the new entrants.

35. As already noted, this suggests that more thought needs to be given to WBA pricing principles than is offered by Article 24 of the current draft[39]. In fact, we think establishing prices for WBA products is likely to be one of the most challenging aspects of the entire regulatory framework for NGAN. No price regulation (beyond the application of effective price squeeze rules) may be required if the SMP operator builds a network architecture which facilitates effective competition via the use of passive remedies. On the other hand, some network architectures could mean that there is no prospect of any effective competition using passive remedies. In these circumstances NRAs will need to intervene to establish regulated WBA prices from the outset.

36. If WBA pricing is to be used to influence the type of NGANs that are built, as we propose, then this needs to be in place before they are built. NRAs will find it very difficult to alter WBA pricing principles ex post and that will serve little purpose if SMP operators have already committed to build particular networks. In our view WBA is about much more than 'safeguarding service competition' which is the task assigned to it in the draft Recommendation (although it does this as well). We believe that WBA pricing is the main lever which NRAs must use to encourage SMP operators to build the most competitive NGANs possible. Put another way, effective use of WBA regulation from the outset will ensure the success of Market 4 remedies and reduce the long term demand for regulated WBA. Neglect of WBA will ensure that Market 4 remedies do not work and will likely increase long term dependence on WBA as a consequence.

How should costs be recovered?

37. There are at least two important issues concerning the pricing of remedies, one of which is partially addressed by the draft Recommendation and one of which is not.

38. The first, which the draft Recommendation addresses in considerable detail, concerns how costs (including the cost of capital) are assessed when deriving prices. The main details are to be found in Annex 1 of the draft.

39. Considerable attention is devoted to the pricing of the passive remedies in the draft, but very little guidance is provided in relation to the pricing of active products such

---

WBA in most other Member States is very limited. Vodafone welcomes the ERG's inclusion of a workstream on WBA in its current 2009 workplan and believes this should be a high priority for ERG.

[39] Or p.10 of the EN

as Wholesale Broadband Access. We have noted above that WBA pricing is likely to prove the greater challenge. Article 24 states only WBA that pricing should be 'consistent with' the prices charged for physical access products.

40. The proposals that are made in Annex 1 seem somewhat muddled. It is obvious that the Commission's intent is to drive prices for certain passive inputs as low as possible and that this has led to the adoption of an approach which treats existing investments as if they are sunk[40]. This represents a significant change to the general approach to regulatory pricing, without any real attempt on the part of the Commission to justify such a radical departure[41]. To see this we need do no more than note that it would put the treatment of sunk NGAN elements at odds with the current treatment of unbundled copper loops.

41. We also see obvious difficulties with the proposed distinction in the pricing treatment of existing and new network elements. It clearly creates incentives for investors to unnecessarily and inefficiently upgrade plant in order to convert 'existing' assets into 'new' assets and benefit from different pricing rules. More significantly, we think that it will in practice be almost impossible for NRAs to distinguish between assets that are 'existing' and those which are 'new' for the purposes of applying the pricing principles which the draft Recommendation proposes. We therefore believe that the current proposal is unjustified and would be very difficult to apply in practice.

42. The second aspect of pricing, which we consider at least as - and perhaps more - important but which is not addressed at all in the draft, concerns how the costs are then shared amongst firms. Since many NGAN assets and facilities are likely to be shared between firms, the question of how the costs will be shared is of fundamental importance.

43. There are several possible approaches to cost allocation. Our strong preference is to apply an allocation method which takes the total costs of the asset and allocates them across users in proportion to their utilization[42]. A heavily utilized asset (eg a duct which is fully used) will have lower unit costs than an under-used asset (a duct which carries spare capacity for future entrants), but in both cases the total costs will be fully recovered across the available demand at all times. This approach obviates the need for more complex 'risk sharing' arrangements, such as have been proposed by some stakeholders.

---

[40] In other words, a fully depreciated historic cost basis, which ignores the replacement costs or costs faced by competitors.

[41] The last paragraph on p.11 of the EN is the only place we find an attempt to do so.

[42] We therefore agree with the Commission that prices should be 'based on a volume measure for physical capacity used' (Annex 1), although we think this is insufficiently precise. This could mean that competitors are required to pay for all of the incremental capacity reserved for competitors including that which is underutilised, that they pay for only that which is used but in large increments such as the entire duct cost, or that they pay only for the exact increment that is used, such as a specific sub-duct cost. We propose that total costs of the physical capacity – irrespective of whether it is utilized - should be allocated across all usage to derive a standard usage increment which should be the minimum that can feasibly be traded. The network owner would be assured of recovering total costs across the total demand. This approach obviates the need for more complex 'risk sharing' cost recovery mechanisms, such as have been proposed by some stakeholders (although it would not of course exclude these if they proved to be commercially attractive between individual parties).

44. We consider this approach better than all the alternatives. Alternatives include arrangements, such as we have seen in some early co-location arrangements in some Member States, under which early users of assets paid the full incremental costs of provisioning facilities for competitors but were subsequently compensated by later entrants if these facilities were then shared amongst more firms[43].

45. It may be argued that, if assets are underutilized, our proposals would unfairly allocate costs which are incurred for the benefit of competitors (e.g. the additional costs of larger cabinets which are then not fully utilized) to the users of the SMP operator. We do not accept that this is unfair or unreasonable. On the contrary, it is well established and generally accepted regulatory principle that the since all end users – of both the SMP operator and the competitors - stand to benefit from competition, it is entirely appropriate that the costs of competition should be allocated amongst all users and not simply those of the new entrants[44].

46. A stronger argument is that this approach increases risk for the network owner to the extent that investment to facilitate competition increases the risk to overall returns from the investment. We would agree with this point and believe that this risk should be properly captured in the risk premium.

Migration arrangements will affect investment long before migration happens

47. The Commission rightly recognizes that the deployment of NGANs remains uncertain. In the meantime, it is essential that investment in current generation broadband competition continues. This means that the migration options available to existing ULL-based competitors in the transition to NGAN need to be clear from the outset and should be one of the first issues addressed. The draft Recommendation recognizes this at Article 16, but provides limited guidance to NRAs about the principles that should be applied.

48. We believe that the aim of establishing an incentive structure to deliver 'maximum competition at minimum overall cost' can also be applied by NRAs to this challenge. 'Maximum competition' means that existing ULL-based investment must have a reasonable prospect of returns. 'Minimum overall cost' requires that the NGAN must allow investors to reduce unnecessary duplication[45]. This is likely to involve the decommissioning of exchanges and other facilities which currently support ULL-based competition, at least in the long term.

49. We believe an appropriate migration framework needs to be established as early as possible by NRAs, since it will affect the current investment climate irrespective of when and whether NGANs are then actually built. The framework should have several features:

---

[43] These arrangements proved unnecessary once 'comingling' allowed a move to allocation approach we are proposing here.
[44] This is, for example, how regulators have treated the set up costs for number portability, see eg, paras 2.130 et seq, http://www.competition-commission.org.uk/rep_pub/reports/1995/fulltext/374c2.pdf
[45] This is recognised, but not resolved, at p.15, EN

- an appropriate Wholesale Broadband Access product should be available to allow existing ULL-based customers to be migrated to an equivalent service without disruption in the event that ULL facilities are withdrawn

- SMP operators should be required to provide a minimum of 5 years notice of their intention to withdraw ULL facilities

- SMP operators could be allowed to withdraw ULL facilities prior to the expiration of the 5 year notice period in some circumstances, but would in this case be required to make available a 'ringfenced' WBA product at a price which would allow existing ULL users to face the same economics as had been available to them under existing facilities based arrangements. These prices (which would likely be lower than general WBA prices) would only be available in respect of lines migrating from existing ULL facilities that were being decommissioned

- SMP operators would then be free to determine whether they wished to adhere to the 5 year notice period and maintain facilities for competitors, or whether they wished to provide a ringfenced WBA product which would allow them to accelerate decommissioning. In either case, the investment case of today's ULL investors would be the same

Specific changes proposed to the draft Recommendation

Art 1 –the text from the Explanatory Note that '*NRAs … seek where possible to reduce entry barriers or offset the potential impact on effective competition where barriers may increase.*[46]' should be included as a clear objective with the addition of the phrase 'as early as possible in the investment cycle'

Art 5 and 6 – these pricing principles (and Annex 1) should be substantially revisited. Specific guidance should be provided as to how costs are to be allocated between users, and the units of charging to be applied

Art 9 – the reference offer should include the WBA product and ex ante pricing rules (if any) for that product in light of the network architecture proposed by the SMP operator (and the consequent prospects for competition in Market 4)

Art 10 – NRAs should do much more than simply require publication and disclosure of network modification plans. This should form the basis of a full consultation with stakeholders with a view to informing NRA guidance on key issues such as the competitive implications of the chosen network architecture and in particular the plans for concentration point location and cabinet specifications. The outcome of this consultation should inform the NRA's approach to the development a reference offer and the pricing of WBA.

Art 14 – the text should make explicit that location of the concentration point should be assessed by reference to the prospects for economically viable competition (see Art 10 above). The Recommendation should not presuppose that this will mean that it resides at or close to the building. It should also be made clear that the decisions subsequently made by the SMP operator as regards the location of the concentration point must be taken into account when determining the appropriate regulatory approach (in particular pricing) to Market 5.

Art 15 – the current proposal that dark fibre is required in certain conditions only should be replaced by a clear obligation upon the SMP operator to provide dark fibre wherever this is technically and physically possible, irrespective of the availability of otherwise of access to ducts or other facilities. Dark fibre pricing should be regulated by the reference offer and the non-price terms should ensure sustainable competition and differentiation. Reference should also be made to pole sharing.

Art 16 – this should make clear that migration arrangements must be established at least 5 years prior to the decommissioning of the network, as we propose above, and that any accelerated migration first requires the availability of a ringfenced WBA product which safeguards existing economic assumptions of investors

Art 17 (and 20) – again, reference is needed to dark fibre being available from the outset

[46] EN p.12

Art 24 (and the Explanatory Note) – much more detail is required with regard to the pricing principles of WBA and the interplay between Market 4 and Market 5. This is explained at length in our submission

Annex 1 – this needs to be substantially revised along the lines outlined in our submission

Annex III Co-investment in Next Generation Access

Different approaches to co-investment are likely to develop under different market conditions. We are sharing these ideas now because there has been widespread interest from regulators and market participants in the co-investment concept and we think it would benefit from wider debate. The contents of this paper do not, of course, represent any commitment to invest or co-invest on the part of Vodafone or any Vodafone Group company or associate.

1. The current EU Regulatory Framework is founded upon two models of competition. The first is infrastructure or platform competition, in which regulation can be withdrawn provided there are sufficient competing platforms. This has been the model applied to the mobile sector, where the main regulatory question has been the number of networks that are required to ensure effective competition and the availability of radio spectrum to allow those networks to be built.

2. The second model is a 'single network, single firm' model, in which regulation has a much more significant role. This is the model applied to the fixed sector, where incumbent operators maintain a monopoly over the existing copper access network. The main regulatory questions have related to the terms under which competitors secure access to the copper network in order to be able to compete with the downstream operations of the incumbent, and the incentives needed to encourage competitors to invest in some minimal level of infrastructure.

The challenges of Next Generation Access Networks

3. The transition to NGA presents the EU Regulatory Framework with new challenges. These challenges mean we cannot assume that the existing framework can simply be rolled forward or that regulators (we use the term in this note to refer to the European Commission, national governments and national regulators) can continue in a 'business as usual' manner. The challenges are well known:

The incentive challenge

4. To date, EU regulators have been concerned with establishing incentives for new entrants to invest but have been able to take sunk investment of the incumbent's existing copper network for granted. This changes for NGA because the entire access network will require new investment, these investments are very large, and these investments will not be made by the private sector without adequate incentives in the form of an expectation of returns. The focus has shifted from the incentives for new entrants to enter to the incentives for incumbents to build.

The margin for error challenge

5. The sunk nature of existing copper access networks and the fact that they had largely already been fully depreciated meant that regulators could misprice inputs without major adverse consequences. For example, setting the price of unbundled local loops at too low a level will not lead to the removal of assets from the market or a reduction in the scope of services being offered to consumers. Regulators could make mistakes or distort pricing signals without significant consequences – at least in the near term. The unsunk nature of NGA and the increasing financial pressures on firms as competition and regulation squeezes out surpluses in other activities means that regulators no longer enjoy the same margin for error. If the pricing signals are wrong in NGA, it simply won't get built in the first place.

The information challenge

6. At the same time, less is known about NGA costs and risks than the existing copper access networks. So whilst the margin for error for regulators is narrower, the amount of information which regulators are likely to have to make well judged decisions is also less than before. These factors combine to make regulation a much more difficult exercise in the NGA environment than in the past.

The commitment challenge

7. A key element in addressing the incentive challenge is the need for regulators to convince investors that they will not change the terms of the game after the investments have been sunk but before they have generated adequate returns. This challenge did not arise when investments had already been sunk. The current EU Framework envisages regular market reviews, allowing regulators to revisit earlier decisions long before any investment in NGA will have paid back. This reflects a view of regulation where regulators apply small adjustments as (it is hoped) the market moves from monopoly to competition. However, what is needed now is much greater commitment from regulators at the outset of the process

The competition challenge

8. It is generally recognised that NGA presents challenge to competition. This is because the economies of scale and density are even greater than for existing copper networks, because the underlying technologies used in NGA may not readily allow competition (for example, street cabinets are much harder to co-locate in than exchanges, and GPONs are much harder to unbundle than copper networks) and because the business case to deploy NGAs may be very limited

unless incumbents can assume remonopolisation and charge a significant pricing premium for new services. Not only does this reduce the opportunities for platform competition, but it also makes competition over a single network, single firm model more difficult than before.

The digital divide challenge

9. Even if regulators could address the challenges described above, the basic economics of NGA for the incumbent operators (and more so their rivals) means that deployment will be relatively limited in geographic scope and that the 'digital divide' is likely to widen rather than to narrow. Regulators could simply accept this as a natural consequence of NGA (although Governments are not likely to), or they could explore alternative models (such as the co-investment model we propose below) to overcome these new challenges.

What is co-investment?

10. Vodafone believes that neither of the traditional approaches – whether regulated monopoly or the hope of platform competition - is likely to be optimal in the face of the challenges outlined above. At the very least, we believe that before the European Commission regulators adopt these approaches they should explore other potential responses. The 'co investment' model is one such option worth further consideration.

What is co-investment

vodafone

- ⇨ Joint ownership, funding and management of a single network (NGNCo)
- ⇨ Participation of the incumbent but not of the State
- ⇨ Majority (but not all) co-investors compete in the downstream retail market
- ⇨ FTTH most likely network topology
- ⇨ NGNCo provides consumer FTTH, but also mobile backhaul for LTE and services to business customers
- ⇨ Sufficient number of participants to ensure no access regulation of NGNCo

HUMAN CAPITAL
STRATEGY • RESEARCH • DEVELOPMENT

2

11. 'Co-investment' involves several firms co-operating to invest in the development of a single NGA network and competing with each other in the downstream retail market. One way to think about this as is an attempt to reconcile the needs of competition and investment by internalising them – competitors become investors and investors become competitors. This is a departure from the more traditional bi-polar world in which investors and competitors are often pitted against each other with regulators in the middle.

12. In this context, 'NGA' refers to both fixed (ie fibre) based networks and to new wireless infrastructure. Our belief is that a single co-invested 'broadband' network will incorporate wireline and wireless access components. Our current view is that, although it is not an inherent feature of what we propose, most co-investment arrangements are likely to involve the participation of the incumbent SMP operator – and that this is generally desirable. The conditions for participation by the SMP operator would be that it must also obtain all of its NGA inputs from the co-invested network on the same terms as are made available to the other co-investors.

13. The critical features of co-investment for us are therefore:

    a. a single network, not duplicate networks
    b. co-ownership and co-management by a number of investors
    c. all investors obtain equal access to the resources of the network
    d. as a result of a-c, effective competition in the downstream retail market

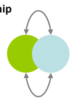
14. There are then many ways in which co-investment might be organised to obtain these features, and many challenges to be addressed in doing so. The remainder of this paper summarises our thinking to date on some of these issues.

Other examples of co-investment

15. The co-investment model has of course often been used for capital intensive investment projects in the telecommunications sector. For example, submarine cable systems have often been built by consortia of investors who secure rights to exploit capacity on the cable and who then compete with each other in downstream markets (the costs of international calling and international data services have fallen dramatically in recent times – suggesting that co-investment can underpin effective competition). Co-investment models of a kind for NGA have also been proposed in Australia and New Zealand. Another relevant model is that of Clearwire, the cellular operator in the US, details of which are provided below:

Case study: Clearwire

Collaborative Partnership



Description

- A 2008 merger between Clearwire (ISP) and Sprint Nextel's wireless broadband unit, combining Sprint's 4G WiMax network (Xohm) with Clearwire's existing pre-Wimax broadband network. Sprint owns 51% of the firm, with ex-Clearwire shareholders owning 27%.
- A consortium of Comcast, Time Warner, Intel, Google, and Bright House then invested $3.2 billion for the remaining stake with the aim of building the first nationwide mobile WiMax network.
- Sprint plans to lease capacity on the new WiMax network and offer the service under its own brand while also selling its 3G wireless services.
- But in exchange for getting access to the WiMax network on the cheap, Sprint will have to give up its coveted 2.5G wireless spectrum asset which will now be shared with Clearwire partners

For Profit?

100%

Rationale for approach

- **Spread risk** associated with WiMax network build amongst various players
- **Reduce costs** – until the merger, Sprint and Clearwire had been on separate paths to build nationwide broadband wireless networks using WiMax
- **Realise operational efficiencies** – Clearwire will lease space on Sprint's existing cell towers to build the network below market rates. It will also be able to use Sprint's long distance fiber network to transport the WiMax traffic throughout the country. In exchange for that, Sprint will have access to Clearwire's wireless backhaul network, allowing Sprint to more efficiently aggregate its existing cellular traffic onto its own long distance fiber network for transport around the country.
- **Speed to market** – partners can build the network and get their new service up and running at least two years before rivals AT&T and Verizon Wireless are able to build similar networks using LTE

Investment form

Equity partnership of c. $3.2 billion and a public listing on the Nasdaq

Disadvantages

- Relatively complicated ownership structure.
- Is publicly traded so exposed to market forces
- Joint build makes build cheaper but does not guarantee its success

Successful?

Unclear, though stock price is down considerably

Relevance to NGN

High. Presents a co-investment model that involves (traditionally competitive) players of various technology heritages contributing network assets with non-traditional network investors (i.e. Google) contributing capital.

78

Case study: Consortium cables

Description

Standard structure used for most sub-sea cables. Participants agree to jointly fund a cable upfront, and receive pro-rata shares of capacity in exchange. Parties pay (small) management fees thereafter. Larger and earlier participants tend to have greater say in planning and operating decisions.

For Profit?

No - capacity and services passed through at cost

Rationale for approach

Cables are expensive ($1bn+) and offer far more capacity than any one telco is likely to need. Moreover, multiple actual and potential cables limit the ability of any one system to charge monopoly rents. Therefore securing demand in advance through a consortium is highly valuable.

Investment form

Cash, time of consortium member staff for planning and management

Disadvantages

Consortium structure can be unwieldy, slow to plan and slow to upgrade.

Successful?

Yes. Unsuccessfully challenged by private cables in telco boom

Relevance to NGN

Potentially a good base, though note that partners are not contributing assets already in use, which simplifies structuring. Similarly, pre-purchase of a block of bandwidth is simpler than consumer driven ad-hoc purchase of individual local connections. Thus NGN would need a substantially more complex approach

73

16. The rationale for co-investment in NGA is also similar to that which led to co-investments in submarine cable systems. It is an attempt to optimise the economics of the investment by eliminating duplication and minimising the risk by distributing it amongst several different firms. The result should be that limited capital is used more efficiently and that more extensive network deployment is achieved than in the duplicate network scenario.

17. Co-investment should be distinguished from other forms of 'risk sharing', such as those which can be accomplished through contractual arrangements in a

conventional customer-supplier relationship, as is advocated by some members of ETNO and referenced in the draft Recommendation. This approach seems to envisage customers reserving capacity on a new network on a long term basis (whether through prepayment or through pre-commitment to subsequent volumes). This differs from our view of co-investment in that the 'investor' in this case is not expected to acquire any long term ownership, control or management rights over the network which they are effectively co-funding (although it is possible that the capacity acquired on the network could be resold). Our view of co-investment should also be distinguished from simple 'swap' arrangements between two or more operators, under which each exchanges access to their respective, non-overlapping, networks.

Organising co-investment

A well structured Co-Investment approach can overcome the challenges of traditional alternatives

Participants	• The number of participants must be 3 or more to safeguard a sufficient degree of downstream competition
Equity ownership	• Equity will be allocated evenly amongst investors to avoid control by any one participant. Value of equity is participation and operational influence not financial returns (since no dividends and market for shares illiquid)
Capacity	• Capacity will be pre-purchased and funded via an auction • Winning the auction entitles the participant to unconstrained access to local connections (with backhaul still to be purchased)
Structure	• The auction (and pre-auction consultation) also determines the number of participants and other characteristics of the network, such as coverage, topology and scope.
Wholesale	• Limited wholesale capacity will be made available for a wholesale participants that will set wholesale rates independent from the retail participants

3

How to ensure investors focus on retail competition?

18. We recognise that the presumption that investors are retail competitors raises questions about how participants could commit to competing in the retail market over time and how such a commitment might be framed when establishing the co-investment vehicle. It is possible, for example, that some participants may hope to compete effectively in the retail market but then decide to withdraw at some later date. Our initial view has been that this is best addressed by structuring the co-investment vehicle in such as way that the investors earn most if not all of the returns from their downstream retail activities and that the returns for simply holding equity in the network venture itself are minimal. We recognise

that this may in turn discourage certain investors who might otherwise wish to invest on a 'wholesale only' or 'equity only' basis (including non-telecoms interests such as financial investors or utility companies) and that it may also make it difficult to leverage the co-investment vehicle with debt. These are important considerations on which we would welcome further discussion.

Issues arising from participation of SMP operator

Control/influence

19. The participation of the incumbent SMP operators raises some significant questions which would not arise if the co-investment were to be undertaken amongst non-SMP operators. The most obvious of these are how to ensure that the SMP operator does not leverage its market power in the downstream retail market to dominate the management and operations of the upstream network activities, and what to do with the existing copper and other infrastructure assets held by the SMP operator.

20. The first of these challenges is simple to observe and difficult to solve. Our current view is that one possible solution is to separate the purchase of equity and rights to participate in the management and governance of the co-investment network from the purchase of capacity on the network (since any structure which links capacity purchase and equity shares together is likely to result in a vehicle dominated by the SMP operator). Equity might then be allocated amongst all participants on an equal basis so as to ensure that no individual shareholder held controlling rights.

21. It is likely, of course, that the incumbent SMP operator will be required to make a major contribution to the financing of the co-investment vehicle. This does not mean that it will do so in order to secure management control – it may simply reflect the fact that the incumbent SMP operator places a high valuation upon its participation in the co-investment project if it is to be undertaken. We recognise, however, that the incumbent SMP operator will likely seek a significant influence over the terms under which the network is established and we envisage that these views will be sought and incorporated into the planning process during what we have characterised below as the 'pre-auction consultation'. In the proposals we envisage, the incumbent SMP operator cannot require the rest of the participants to accepts its proposals (whether in terms of network architecture, roll out schedule etc), but it can narrow the range of feasible options to which the rest of the industry must then apply their evaluations.

22. An illustrative view of the decisions which will need to be made by shareholders, many of them prior to the establishment of the venture, and those which would then be governed by the Board and/or delegated to the co-investment management is shown below:

Governance; value shift decisions, such as upstream and downstream pricing, will need to be made by the board (or higher)

Tier	Responsibility	Comment
Shareholders	• Broad roll-out plan • Admission of new participants	• Roll-out plan and structure of pricing likely to be pre-agreed on the creation of NGNCo, though may be subsequently varied
Board	• Approve detailed roll-out plan • Approval of input asset contracts with incumbent	• All participants have the same vote as equity is distributed evenly
NGNCo Management	• Operational execution	• Choice of NGN Co CEO likely to be important to shareholders – candidate from outside any shareholder may be preferred

Note: 'Traditional' governance issues (eg payment of dividends, approval of annual plans etc) omitted

HUMAN CAPITAL
STRATEGY • RESEARCH • DEVELOPMENT

13

Treatment of the copper network

23. The second question arising from the participation of the incumbent SMP operator is the treatment of the existing copper assets. This is another area on which we would welcome further discussion.

24. We of course see the attractions of allowing the SMP operator to contribute these assets to the co-investment vehicle, thereby realising important synergies with the fibre deployment and allowing the other co-investors to obtain access to existing copper based products via the co-investment vehicle. It would also give the co-investment vehicle a strong cashflow from the outset, creating new financing opportunities for the venture.

25. However, we can also see significant challenges arising from this approach. Firstly, the configuration of the co-investment model –without third party regulatory access obligations – does not fit well with the existing regulatory framework for copper services. The co-investment vehicle would potentially find itself subject to complex SMP regulatory obligations or would have to lease assets back to the SMP operator to fulfil them. In either case this adds further complexity to what is already a complex governance model. Second, it is unclear to us how other co-investors could acquire the existing copper infrastructure (and the associated cashflows) which might be worth billions of euros whilst at the same time seeking to fund investments in NGA infrastructure. It is of course possible that a group of investors might approach the incumbent SMP operator to acquire the copper assets of that business and this possibility should certainly not be excluded in our model. But it is not obvious to us that this can or should be explicitly envisaged.

26. At this stage it is uncertain whether an SMP operator would be prepared to contribute its existing copper assets to such a venture. Greater risk clearly

attaches to the NGA co-investment than to its existing copper business, both in terms of potential financial returns and in terms of the potential financial stability of other participants. It may be that a phased migration of existing assets into the co-investment venture over time (as NGA overbuilds copper plant and users are migrated) is the optimal approach here.

27. The fact that the SMP operator may not contribute assets into the co-investment venture to be owned in common by the co-investors does not of course preclude their use by the co-investors on an arms length basis. We envisage that a significant portion of the new NGA network will utilise personnel and other assets owned by the SMP operator (as well as of other co-investors), with these being purchased by the Netco on conventional commercial terms. The kinds of purchasing decisions which the Netco shareholders and management will need to make in this context are illustrated below:

Operational issues

vodafone

	Approach	Comment
Network Planning	• Indigenous to NGNCo	• Will be in the context of roll-out plan agreed by shareholders/board
Network Build	• Put out to tender	• Incumbent may win tender, though other parties capable
Maintenance & Fault Management	• Outsourced to incumbent	• Incumbent has nationally available staff, and may already be maintaining some ducts • Post-CSO, may transfer to NGN Co?
Network Ops	• Indigenous to NGNCo or provided by equipment vendor	• Will be a more complex task if active interconnect including backhaul to core
Partner Management (i.e. sales, orders, billing)	• Indigenous to NGNCo	• May be appropriate to buy licence to incumbent's systems in use for some purpose in the rest of the country
SG&A (i.e. finance, HR)	• Indigenous to NGNCo	

HUMAN CAPITAL
STRATEGY • RESEARCH • DEVELOPMENT

14

Rights to participate

28. 'Participation' means those who do not invest will have no assured or regulated access to the network infrastructure. Note however that it will be open to the participants to wholesale capacity to third parties, as occurs in the mobile market today, and we are proposing that some capacity in the network is reserved for a 'wholesale only' investor. It is critical to understand that the co-investment model will not and is not intended to produce a perfectly competitive market with no barriers to entry and hundreds of retail competitors. Rather, it is intended to resolve the tension inherent in the pursuit of both competition and investment.

29. There are two important points here. First, investors in high risk projects with large fixed and sunk costs, such as NGA, will not risk capital unless there is a market structure which promises sufficient rents to deliver a return on total costs to

investors. Excluding non-participants is intended to create a market structure which might sustain such investments. Second, investors will not risk capital in NGA if they can access the same returns at a later date without investing at all, or by investing only once the success of the project is assured. This means that there must be strong incentives to participate at the outset – and returns for doing so that cannot otherwise be gained simply by waiting to enter at some later date after the project has proved to be a success.

Allocating rights to participate

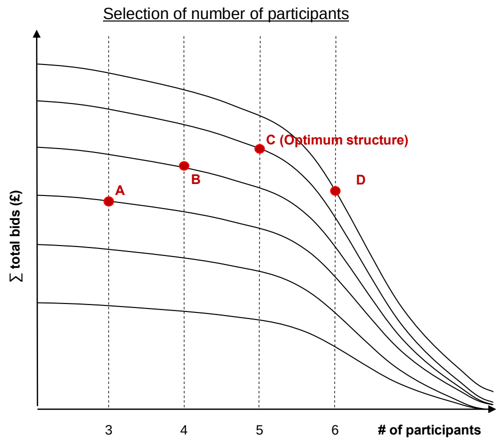
30. The mechanisms by which rights to participate are allocated are therefore a critical challenge in any co-investment project. We think they must be transparent and fair to all in order to be accepted by both the market and the regulatory authorities. There are many ways in which this might be accomplished.

31. Auctions are sometimes used for tasks such as this and we have therefore developed an illustrative example of how such arrangements might work. Again, we recognise that other mechanisms, such as bargaining directly between potential investors, might achieve similar results. In all cases it will be important that the resulting agreements command widespread acceptance and legitimacy from all market players – both those who may subsequently participate in the network and those that may not. Failure to achieve this is likely to mean litigation and delay to investment.

32. In the case we have in mind, bidders might bid for rights to participate in the co-investment vehicle, with bidders placing different valuations against different 'packages' which might be defined by the number of other co-investors (and hence the overall scale of the NGA and the likely nature of competition) and by other variables such as different options for network architecture or roll out. Clearly, some form of extensive pre-auction consultative process – perhaps overseen by the regulator - would be required to narrow down the options on which bidding might subsequently occur.

33. In theory, this model would seek to find the optimal balance between investment and competition within the co-investment vehicle – as the number of potential participants increases we would expect the valuation of any individual participant to diminish but the aggregate value of all participants to increase up to some point. This is illustrated on the slide:

In the auction phase, each participant (other than the incumbent) will provide multiple bids, one for each potential structure



A: Sum of top 3 bids for '3 participant' structure
B: Sum of top 4 bids for '4 participant' structure
…

HUMAN CAPITAL
STRATEGY • RESEARCH • DEVELOPMENT

- Bidders will fill in a matrix of bids, against the dimensions of number of participants and NGNco coverage, architecture and scope
- Incumbent preferences will be transparent to all other bidders
- The currency of bids will be 'percentage of cost for that structure' (but the cost of different structures will vary – for instance, FTTH will be more expensive than FTTC)
- Effectively multiple single bid auctions will be run in parallel, with the auction that gives the best result determining the optimal structure, and the winning bidders in that auction becoming the participants in NGNco
- To select the 'best' result, the auction with the highest aggregate winning bids will be compared
- If the sum of percentages in this best result is less than 100%, then the auction has failed – there is no structure of NGNco that the market is willing to fund
- If the sum of percentages is greater than 100%, the the overbid will be used to extend the coverage of NGNco
- If the best result is for an 'x participant' structure, the top x bidders in that auction become the participants in NGNco

9

Changing the participants

34. It must then be possible for original investors to exit and for new investors to join the co-investment project at some point following the initial establishment – the composition of the co-investors cannot be expected to be static or unchangeable.

35. We assume that the original establishment of the co-investment vehicle was subject to regulatory oversight to ensure that the composition of the network was sufficient to allow a finding of no SMP. That being the case, we expect the co-investors to be subject to restrictions which would generally seek to prevent any existing investor from acquiring the shares (and/or corresponding retail customers) of another (and would expect that, were this to happen, it would trigger a market review by the NRA).

36. This noted, there are obviously many ways in which an operator could participate in the NGA retail market under our proposals without having themselves to acquire equity in the co-investment vehicle: they can purchase capacity from the wholesale investor or purchase capacity from the retail investors.

37. This leaves two other possible cases: a private transaction between an existing co-investor as a seller and a new co-investor as a buyer (whether of the entire business activities of the seller or simply of their co-investment interests), and a transaction in which all existing co-investors agree to issue new shares to a new investor who then increases the overall number of participants (and hence retail competitors).

38. In the former case, we see no obvious reason why such a transaction could not be undertaken at any time since it would not change the number of competitors in the downstream market. The only requirements that we might envisage at this stage would be that the participation rights in the co-investment could not be sub-divided or sub-leased in any way.

39. The admittance of new investor is more complex because the option to participate in the venture at a later date inevitably affects the investment incentives for the original participants. If the option to participate later is too attractive then all the potential investors will simply wait and the project will not get off the ground. Our current proposal for this is that any potential participant could, at any time, approach all the existing shareholders with an offer to purchase new shares. The existing shareholders would be required to vote on this proposal, subject to some kind of supermajority rule. If this supermajority rule were met, the new shares would be issued. If it is not met, the potential participant is then free to approach only those shareholders voting 'yes', who are then free to sell their individual shares as a private transaction. Again, this is an issue on which we would welcome further discussion.

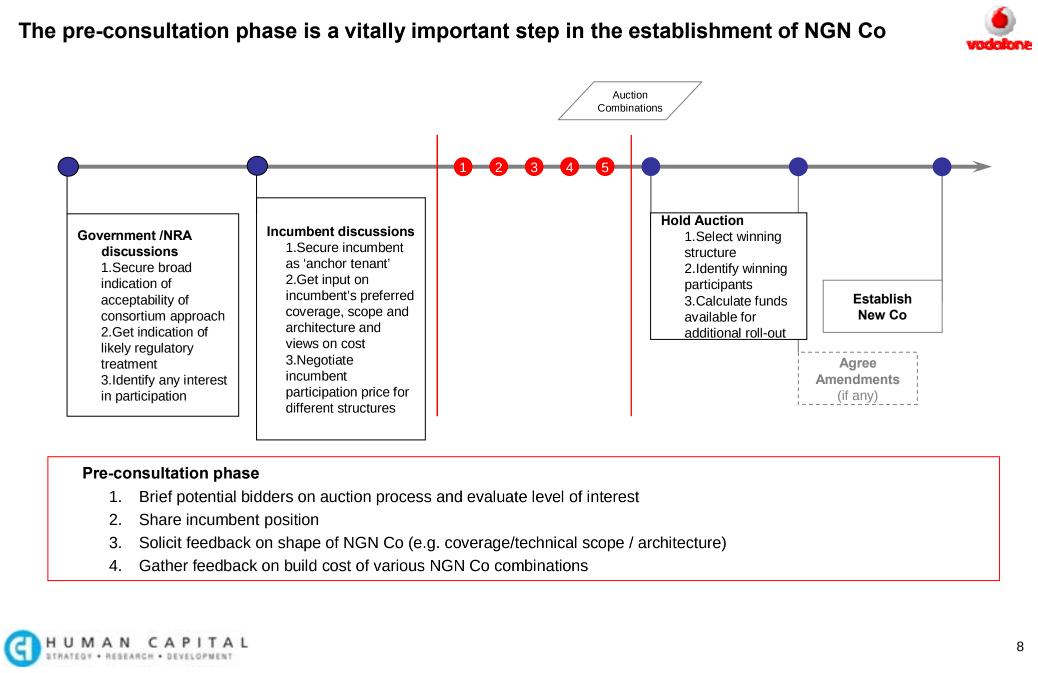
40. A further issue arises in the longer term once the initial funding round has been completed and it is intended to extend or otherwise upgrade the network. Co-investors will need to agree at the outset whether this will trigger new opportunities to participate and, if so, on what terms.

Generating interest amongst investors

41. The alignment of interests amongst investors and the potential exclusion of third parties will clearly result in a suboptimal outcome for consumers unless there are sufficient investors in the network to compete directly in the downstream retail market (or to create a wholesale market which allows third parties to enter and compete downstream). In other words, if the highest bid in the auction we outline above arises from the valuation of one player of a monopoly position (or two players and a duopoly) then the auction would have to be voided

42. Attracting enough investors to participate in the co-investment project must therefore be a key objective for policymakers. Different types of investors will also be important to avoid the risk of tacit collusion – this is one important reason why a combination of mobile and fixed investors and a combination of mobile and fixed assets in the venture is likely to be important. We do not exclude non-telecoms participation – for example for other utility owners - although we explained above that we currently see the majority of returns on the investment being generated at the retail level rather than being paid out to shareholders in the network.

43. As with other auctions and projects of this nature, it is likely that regulators or Governments may wish to 'market' their proposals to a wide range of potential investors in order to solicit interest during a pre-auction consultation phase. The process we might envisage is illustrated below:



Creating a wholesale market

44. We recognise that it may also be necessary to guarantee wholesale supply – both to safeguard continuity in the provision of legacy DSL commitments by the co-investment network and to ensure that there is some assurance of supply of wholesale services to those who do not wish, or who are unable, to participate directly in the co-investment vehicle. This noted, we do expect that the retail co-investors may also wish to wholesale access to third parties – and would compete with each other to do so. We have also already explained how non-participants can invest in the venture on a subsequent occasion.

45. Since a key objective in establishing the co-investment vehicle is to avoid the need for traditional wholesale regulation on an on-going basis, we wish to avoid wholesale pricing regulation. Instead we envisage that a certain quantity of the wholesale capacity on the new network to be reserved for a wholesale only investor.

46. We currently see this as a much more attractive model than one in which the network itself wholesales access to the network. In those circumstances the pricing policy of the network would then have to be determined jointly by the co-investors or, more likely, by the regulator. However, we recognise that our model still faces a number of challenges concerning the attractiveness of participation by a wholesale-only investor, how any capacity constraint upon that investor would be determined, and how transfer prices would operate between the Netco and the wholesaler. This latter point is of critical importance because it determines the revenues passing between the wholesale and retail operators as purchasers of capacity on the one hand, and revenues to the Netco and hence to those same operators as owners of equity on the other. This issue is particularly difficult and complex because the interests of each of the co-investors may differ

– some may prefer to reduce their input costs to maximise their revenues from downstream retail activities, whilst others may prefer to maximise their returns on their equity participation. These are complex issues on which we would welcome further discussion.

Flexibility in retail pricing

47. A key challenge for NGA is the need to allow the market to develop innovative retail pricing models to build and respond to demand, whilst at the same time ensuring effective competition. One potential response to this is to devise complex price squeeze rules which seek to compare retail prices for a set of services over the product lifecycle with assumed or regulated input costs. Such rules are intended to preserve as much retail pricing flexibility as possible consistent with SMP regulation – but it is difficult to avoid the suspicion that some 'chilling' of the competitive dynamics and opportunities is inevitable, even with the most sophisticated regulatory approaches.

48. The co-investment model should allow greater retail price flexibility than is conceivable under the traditional 'input pricing/price squeeze' model favoured by regulators. We think achieving this is one of the greatest challenges for the model (although we are in no doubt it should be an objective). Of course, it also has implications for other aspect of the model – in particular how/whether revenues are generated by the Netco and what returns equity investors might therefore expect to earn and how the venture might be financed. On the other side it also determines what costs participants will face from the Netco. In other words, it determines how risk is allocated between retailers and shareholders, or rather between co-investors in these different capacities. As discussed previously, this is complicated by the fact that the interests of different participants acting in different capacities are likely to differ significantly.

49. We think this problem is soluble, but recognise that it is difficult. We know that full transfer pricing between the Netco and the purchasers of capacity on the network would simply replicate the regulated model. On the other hand, we also know that allowing operators to obtain capacity at zero marginal cost might maximise retail pricing flexibility but would also introduce risks that no investor would make a return on their investment (thereby reducing the prospects that the project gets of the ground in the first place). Some compromise between these models is likely to be the answer. This is another area on which we would welcome more discussion. We outline below the likely range of options for consideration:

Possible pricing structures - summary

Increasing participant *customer* risk

Increasing participant *equity* risk

Option	Description	Pros	Cons	Comment
Fully variable	Monthly charge per line used. Similar to ULL pricing today	• Puts a floor on retail market pricing • Simplifies differential pricing (eg CSO tariff) • Familiar to retailers and regulators	• May limit retail pricing flexibility • Reduces retailers' short term incentives to push uptake • May (in the short term) create free rider problem • How to justify preferential pricing for participants?	• Demand risk sits with NGNCo (and its shareholders) • Any sales to 3rd parties likely to be based on variable pricing regardless of pricing to participants
Variable pricing with spend commitment	As above, but with commitment to spend at least £x over y years	• Validates differential pricing • Better reflects underlying economics • Reduces free-rider problem	• May encourage dumping (in either the retail or wholesale markets) by those with unused commitments • Still appropriate after initial period?	• Portion of demand risk with individual parents
IRU plus variable pricing thereafter	Part similar to consortium cable	• Validates differential pricing (over longer period) • Better reflects underlying economics • Reduces free-rider problem	• Dumping problem may persist longer, given lifespan of IRU • Requires market clearing mechanism in case retail share < IRU ownership	• Greater portion of demand risk with individual parents
'Capacity Option'	Participants agree to fixed total fees, independent of usage	• Simple • Maximises retail price flexibility (in marginal zone) • Increases likely usage • Solves CSO problem	• Real risk of dumping (unless restricted) • May be challenging to establish given heterogeneous partners	• Demand risk with individual parents as retailers

Participant return increasingly driven by *own* demand

Participant return increasingly driven by *aggregate* demand

50. HUMAN CAPITAL STRATEGY • RESEARCH • DEVELOPMENT 18

51. **Rapid migration from copper to NGA**

52. One of the challenges for regulators (and competitors) is that the 'single firm single network' model results in one firm moving ahead with the next generation of technology whilst its competitors remain stranded on the current copper network. Regulators then either have to disregard the competitive consequences of this or accept long periods in which NGA infrastructure is run in parallel with existing copper facilities. Both of these outcomes are undesirable.

53. Co-investment provides the opportunity for a more co-ordinated and hence more rapid transition from copper to fibre. This will in turn improve the underlying economics of NGA deployment, improving the rate or scope or both.

54. We have discussed elsewhere[47] the possibility that regulators or Governments may have a role in accelerating copper switchover, as they have done in the migration from analogue to digital terrestrial transmission platforms. The case for Government involvement arises independently of the particular model for NGA investment is deployed, but we think co-investment is particularly well suited to addressing the underlying co-ordination problems which arise. In other words, even if a joint industry vehicle is not established at the initiative of Government to build the NGA network, something of this kind is subsequently likely to be required to oversee the migration of users between copper and NGA.

[47] See Vodafone comments on 2nd draft NGA Recommendation